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# THE "ARTICLE OF MANUFACTURE" IN 1887

*Sarah Burstein*[†]

## ABSTRACT

One of the most important questions in contemporary design patent law is how to interpret the phrase "article of manufacture" in 35 U.S.C. § 289. While there has been much discussion about what Congress intended when it enacted the predecessor to § 289 in 1887, there has been little discussion about what the phrase "article of manufacture" meant in 1887. This Article aims to fill that gap. It examines the relevant statutory text, late nineteenth–century patent treatises, Patent Office decisions, and court cases. Based on this evidence, this Article concludes that in 1887, the phrase "article of manufacture" was not a synonym for "product" and did not refer to any "thing made by hand or machine." Instead, "article of manufacture" was a term of art that referred to a tangible item made by humans—other than a machine or composition of matter—that had a unitary structure and was complete in itself for use or for sale. This historical evidence should be considered in evaluating arguments about the statute's "plain meaning" and the original congressional intent. It also undercuts both the Federal Circuit and Supreme Court interpretations of the phrase "article of manufacture." Additionally, this evidence demonstrates that, because machines were not considered "articles of manufacture" in 1887, the 45th Congress did not intend the results decreed by the Federal Circuit in it 2015 decisions in *Apple v. Samsung* and *Nordock v. Systems*.

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## I. INTRODUCTION

Section 289 of the Patent Act provides that any person who, "without license of the owner, (1) applies the patented design, or any colorable imitation thereof, to any article of manufacture for the purpose of sale, or (2) sells or exposes for sale any article of manufacture to which such design or colorable imitation has been applied shall be liable to the owner to the extent of his total profit, but not less than $250 . . . ."[1] This remedy has been a part of U.S. patent law since 1887, but the U.S. Court of Appeals for the Federal Circuit ("Federal Circuit") did not have to decide how to interpret the phrase "article of manufacture" in § 289 until 2015.[2]

In its 2015 decisions in *Apple v. Samsung* and *Nordock v. Systems*, the Federal Circuit ruled that when design patent owners prevail on infringement claims, § 289 requires courts to award no less than the "total profit from the article of manufacture bearing the patented design"[3] and that, in this context, "article of manufacture" means the entire infringing

1. 35 U.S.C. § 289 (2012); *see also* Sarah Burstein, *The Patented Design*, 83 TENN. L. REV. 161, 219 (2015) [hereinafter Burstein, *The Patented Design*] (noting that this provision "provides design patent owners with a special remedy for certain commercial acts of infringement"). Design patent owners are also entitled to most of the other remedies available under the Patent Act, including monetary remedies under 35 U.S.C. § 284. *See* Sarah Burstein, *Costly Designs*, 77 OHIO ST. L.J. 107, 118–19 (2016) [hereinafter Burstein, *Costly Designs*]. However, provisional rights are not available for regular design patent applications because those applications are not published prior to issuance. *See* 35 U.S.C. § 154(d)(3); 35 U.S.C. § 122(b)(2)(iv).

2. *See infra* Section III.B.1.a). The Federal Circuit has had exclusive jurisdiction over patent appeals since 1982. *See* Federal Courts Improvement Act of 1982, 28 U.S.C. § 1295(a)(1).

3. *See* Apple Inc. v. Samsung Elecs. Co., 786 F.3d 983, 1001–02 (Fed. Cir. 2015), *rev'd sub nom.* Samsung Elecs. Co. v. Apple Inc., 137 S. Ct. 429 (2016).

product.[4] In its 2016 decision in *Samsung v. Apple*, the Supreme Court rejected the Federal Circuit's interpretation, stating "[t]he term 'article of manufacture,' as used in § 289, encompasses both a product sold to a consumer and a component of that product"[5] because "[a]n 'article of manufacture' . . . is simply a thing made by hand or machine."[6] The Court, however, refused to provide any test or further guidance regarding how lower courts should decide what constitutes the relevant "article" in a given case.[7] So now, the question of how to interpret the phrase "article of manufacture" in § 289 is more important than ever. Hundreds of millions of dollars hang in the balance in *Apple* alone.[8]

Throughout the *Apple* and *Nordock* litigation, there has been much discussion about what Congress intended when it enacted the predecessor to § 289 in 1887.[9] However, there has been little discussion about what the phrase "article of manufacture" meant in 1887.[10] This Article aims to fill that gap. It is the first article to comprehensively examine what the phrase "article of manufacture" meant when Congress enacted the predecessor to § 289 in 1887.[11] It examines what the phrase "article of manufacture" meant

4. *Id*. at 1002; Nordock, Inc. v. Sys. Inc., 803 F.3d 1344, 1354 (Fed. Cir. 2015), *rev'd sub. nom.* Sys., Inc. v. Nordock, Inc., 137 S. Ct. 589 (2016). These cases are discussed in more detail *infra* Section III. Unless indicated otherwise, this Article will use the word "product" to mean "something sold by an enterprise to its customers." KARL T. ULRICH & STEVEN D. EPPINGER, PRODUCT DESIGN AND DEVELOPMENT 2 (5th ed. 2011).

5. *Samsung*, 137 S. Ct. at 434.

6. *Id.* at 435.

7. *See id*. at 436.

8. *See* Brief for Petitioners at 5, Samsung Elecs. Co. v. Apple Inc., 137 S. Ct. 429 (2016) (No. 15-777), 2016 WL 6599922 (noting that the $399 million award that was at issue on certiorari was only part of the potential profits award).

9. *See, e.g.*, Brief for Roger Cleveland Golf Company, Inc. as Amicus Curiae in Support of Respondent at 22, Samsung Elecs. Co. v. Apple Inc., 137 S. Ct. 429 (2016) (No. 15-777), 2016 WL 4205620 ("Congress has seen fit to retain the relevant 'total profit' statutory language and hence has retained intact its intent since 1887, for nearly 130 years . . . ."); Brief for Computer & Communications Industry Association in Support of Petitioner at 3, Samsung Elecs. Co. v. Apple Inc., 137 S. Ct. 429 (2016) (No. 15-777), 2016 WL 3227039 ("Congress never intended the 'article of manufacture' to automatically swallow the end-good in which the article incorporating an infringing design is included.").

10. A few of the *Samsung v. Apple* amicus briefs touched on some of the cases and decisions discussed in this Article. *See, e.g.*, Brief for The Internet Association et al. as Amici Curiae Supporting Petitioners at 15–17, Samsung Elecs. Co. v. Apple Inc., 137 S. Ct. 429 (2016) (No. 15-777), 2016 WL 3194217. But none conducted an in–depth analysis of all of the historical evidence discussed here.

11. In a 2013 article, William J. Seymour and Andrew W. Torrance noted that the meaning of "article of manufacture" has changed over time but focused their analysis mainly on twentieth century case law and late–twentieth century Patent Office decisions.

in the context of statutory subject matter—considering the relevant statutory text, Patent Office decisions, and judicial decisions—and analyzes the history behind the enactment of the 1887 Patent Act. This Article concludes that in 1887, the phrase "article of manufacture" was a term of art in U.S. patent law that referred to a tangible item made by humans—other than a machine or composition of matter—that had a unitary structure and was complete in itself for use or for sale.[12] There is no evidence that Congress meant to depart from this well–established meaning when it enacted the predecessor to § 289.[13]

This does not necessarily mean that courts must read the phrase "article of manufacture" in § 289 the same way as it was read in 1887.[14] But this historical context has important implications for current debates over the intent and interpretation of § 289. For example, the historical evidence indicates that in 1887, "article of manufacture" was a term of art in U.S. patent law.[15] This undermines the Federal Circuit's "plain meaning" interpretation of § 289.[16] This evidence also shows that in 1887, the phrase "article of manufacture" was not a synonym for "product"[17] and that Congress did not intend the results in *Apple* and *Nordock* because, among other reasons, machines were not considered "articles of manufacture."[18] The evidence further demonstrates that in 1887, "article of manufacture" did not mean any "thing made by hand or machine."[19] Therefore, the Supreme Court's dictionary–based interpretation was incomplete, at least as a historical matter.[20]

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*See* William J. Seymour & Andrew W. Torrance, *(R)evolution in Design Patentable Subject Matter: The Shifting Meaning of "Article of Manufacture"*, 17 STAN. TECH. L. REV. 183, 190–205 (2013). Other commentators have criticized the district court's "total profits" ruling in *Apple v. Samsung* but have not focused on the "article of manufacture" issue. *See* Mark A. Lemley, *A Rational System of Design Patent Remedies*, 17 STAN. TECH. L. REV. 219, 221 (2013); Thomas F. Cotter, *Reining in Remedies in Patent Litigation: Three (Increasingly Immodest) Proposals*, 30 SANTA CLARA HIGH TECH. L.J. 1, 20–21 (2013).

12. *See infra* Section V.A.
13. *See infra* Section IV.B.2.
14. There are good reasons for courts to readopt this historical meaning of "article of manufacture." However, a full discussion of those reasons is beyond the scope of this Article.
15. *See infra* Section V.A.
16. *See infra* Section V.A.
17. *See infra* Section V.B.1.
18. *See infra* Section V.C.
19. *See infra* Section V.B.2.
20. *See infra* Sections III.B.2, V.A.

This Article proceeds in six parts. Part II provides a brief introduction to the relevant portions of U.S. design patent law. Part III provides a critical analysis of the Federal Circuit's interpretation of the phrase "article of manufacture" in § 289 and the Supreme Court's reversal of that interpretation. Part IV examines the relevant statutory text, late nineteenth–century patent treatises, Patent Office decisions, and court cases to determine what the phrase "article of manufacture" meant in 1887. Part V discusses the lessons that can be learned from—and some key implications of—the historical evidence presented in Part IV. Part VI addresses some potential objections.

## II. DESIGN PATENTS – A BRIEF INTRODUCTION

Like other patents, design patents are granted by the United States Patent and Trademark Office ("USPTO") following substantive examination.[21] Like other patents, design patents are subject to the statutory requirements of novelty and nonobviousness.[22] The Federal Circuit has exclusive jurisdiction over appeals from design patent cases, like it does for other patent cases.[23] However, design patents differ from other patents in important ways, including what types of inventions are protected, how those inventions are claimed, and how courts evaluate infringement. This Section describes the current law regarding design patent claiming, design patent infringement, and design patentable subject matter.

### A. STATUTORY SUBJECT MATTER

Since 1902, design patents have been available for "any new, original, and ornamental design for an article of manufacture."[24] Today, that language appears in § 171(a) of the Patent Act.[25] There are three key

21. *See* 35 U.S.C. § 131 (2012). Currently, the United States grants three types of patents: utility patents, plant patents, and design patents. U.S. PATENT & TRADEMARK OFFICE, MANUAL OF PATENT EXAMINING PROCEDURE § 200-01 (9th ed. 7th rev., Nov. 2015) [hereinafter MPEP].

22. *See* 35 U.S.C. § 171(b) (Supp. I 2013); *see also id*. §§ 102, 103. However, courts use different tests for novelty and nonobviousness in the design patent context than they do in the utility patent context. *See* Sarah Burstein, *Moving Beyond the Standard Criticisms of Design Patents*, 17 STAN. TECH. L. REV. 305, 322–28 (2013).

23. *See* 28 U.S.C. 1295(a) (2012).

24. Act of May 9, 1902 ch. 783, 32 Stat. 193, 193 (amending Rev. Stat. § 4929); Act of July 19, 1952, ch. 950, 66 Stat. 805 (codified at 35 U.S.C. § 171 (2012)); 35 U.S.C. § 171(a) (Supp. I 2013).

25. 35 U.S.C. § 171(a) (Supp. I 2013).

requirements for design patentable subject matter; this Section discusses them in turn.[26]

*1. "Ornamental"*

Ornamentality has been an explicit requirement for design patentability since 1902.[27] Under current Federal Circuit case law, a design will be deemed "ornamental" unless: (1) there are no alternative designs with "the same or similar functional capabilities,"[28] or (2) the design is concealed during the entire lifetime of the completed product.[29] These conditions rarely occur. There are almost always alternative designs available. And almost every part of every product is visible to someone at some point during the product's lifecycle, even if only during repairs. Therefore, the USPTO regularly grants—and courts are required to uphold—design patents for designs that are valuable solely for their utilitarian (as opposed to aesthetic) characteristics[30] and for designs that are not intended to be seen by their end users.[31]

*2. "Design"*

For the first sixty years of the U.S. design patent system, Congress set forth the types of patentable designs in long, detailed lists.[32] The first design patent act protected, for example, "any new and original design for the

26. To date, the phrase "new and original" has not been given independent significance in design patent case law. *But see* Int'l Seaway Trading Corp. v. Walgreens Corp., 589 F.3d 1233, 1238 (Fed. Cir. 2009) (suggesting in dicta that the originality requirement "likely was designed to incorporate the copyright concept of originality—requiring that the work be original with the author . . . .") (citing 1–2 MELVILLE B. NIMMER & DAVID NIMMER, NIMMER ON COPYRIGHT § 2.01 (2005)).

27. *See* Act of May 9, 1902, ch. 783, 32 Stat. 193, 193 (revising Rev. Stat. § 4929); Act of July 19, 1952, ch. 950, 66 Stat. 805 (codified at 35 U.S.C. § 171 (2012)); 35 U.S.C. § 171(a) (Supp. I 2013).

28. *See* Sarah Burstein, *Commentary:* Faux Amis *in Design Law*, 105 TRADEMARK REP. 1455, 1456–57 (2015) (quoting Ethicon Endo-Surgery, Inc. v. Covidien, Inc., 796 F.3d 1312, 1331 (Fed. Cir. 2015)).

29. *Id.* at 1457 (explaining the Federal Circuit's "hidden in use" rule).

30. *See, e.g.*, Integrated Supercharger and Charge-Air Cooler System, U.S. Patent No. D762,246 (issued July 26, 2016); Medical Connector, U.S. Patent No. D761,421 (issued July 12, 2016); Busbar, U.S. Patent No. D757,657 (issued May 31, 2016).

31. *See, e.g.*, Interbody Implant, U.S. Patent No. D748,263 (issued Jan. 26, 2016); Mattress Foundation, U.S. Patent No. D682,594 (Hartley) (issued May 21, 2013); Turf Underlayment, U.S. Patent No. D637,318 (issued May 3, 2011).

32. *See, e.g.*, Act of Aug. 29, 1842, ch. 263, § 3, 5 Stat. 543, 543–44. The word "design," by itself, provides little help in defining the universe of covered subject matter. *See* Burstein, *The Patented Design*, *supra* note 1, at 166; Burstein, *supra* note 22, at 308.

printing of woollen, silk, cotton, or other fabrics" and "any new and original impression or ornament, or to be placed on any article of manufacture, the same being formed in marble or other material."[33] Beginning in 1902, however, Congress took a new approach, revising the statute to state that design patents could be obtained for "any . . . design for an article of manufacture."[34] This language is still used today.[35]

Regardless of the precise statutory language used, it has long been held that there are two classes of protectable designs—designs for "surface ornamentation applied to an article" and designs for "the configuration or shape of an article"—and that applicants can claim a design for configuration, surface ornamentation, or a combination of both.[36] Today, however, design patent applicants can define their "design" as something less than an entire configuration or surface ornamentation design. This change can be traced back to a 1980 decision by the Court of Customs and Patent Appeals ("CCPA").[37]

In *Zahn*, the applicant claimed a design for the shank portion of a drill bit.[38] The drill bit was "integral—all in one piece."[39] The applicant submitted the following drawings, using dotted lines to indicate the portions of the drill bit he wished to exclude from the scope of his claim[40]:

33. Act of Aug. 29, 1842, ch. 263, § 3, 5 Stat. 543, 543–44.

34. Act of May 9, 1902, ch. 783, 32 Stat. 193, 193 (revising Rev. Stat. § 4929).

35. 35 U.S.C. § 171(a) (Supp. I 2013).

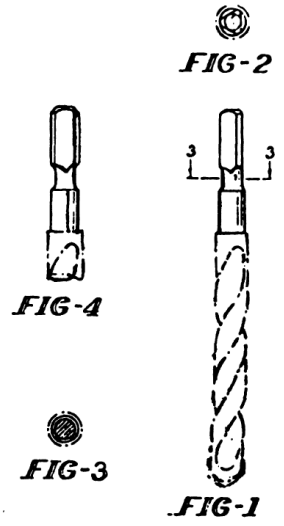
36. *See* MPEP, *supra* note 21, at § 1502; *In re* Schnell, 46 F.2d 203, 209 (C.C.P.A. 1931); Gorham Mfg. Co. v. White, 81 U.S. 511, 525 (1871). In contemporary design patent law and practice, "configuration or shape" is generally understood to mean "any three-dimensional design" and "surface ornamentation" as "any two-dimensional design." *See, e.g.*, MPEP, *supra* note 21, at § 1504.01(a)(I)(A) (suggesting that any "2-dimensional images" would qualify as "surface ornamentation"). This marks a significant change from the past. *Compare, e.g.*, *id.*, *with Ex parte* Gérard, 1888 Dec. Comm'r Pat. 37, 40.

37. *See In re* Zahn, 617 F.2d 261 (C.C.P.A. 1980). In its first decision, the Federal Circuit adopted the precedents of the CCPA as its own. South Corp. v. United States, 690 F.2d 1368, 1370 (Fed. Cir. 1982).

38. *Zahn*, 617 F.2d at 263.

39. *See id.*; *see also id*. at 262 (showing the applicant's drawings).

40. *Id.* at 262–63.




The USPTO rejected the claim because, among other reasons, "a design which is embodied in less than all of an article of manufacture at least in one which is an integral or one-piece article such as a drill, or a screwdriver" did not qualify as "any new, original and ornamental design for an article of manufacture."[41] The CCPA reversed, holding that "a design for an article of manufacture may be embodied in less than all of an article of manufacture."[42]

Since *Zahn*, design patent applicants have been allowed to claim any portion—or portions—of a configuration or surface ornamentation design as their "design." These portions do not have to be physically separable or be manufactured separately; like the claim in *Zahn* itself, the claimed portion can be a fragment of a solid whole.[43] Nothing in *Zahn* requires that the claimed portion (or portions) cover an important, salient, or otherwise

41. *Id.* at 267.

42. *Id.* This was a radical redefinition of the statutory term "design." *Compare id., with, e.g., Ex parte* Pope, 1883 Dec. Comm'r Pat. 74, *and Ex parte* Gérard, 1888 Dec. Comm'r Pat. 37. However, a full discussion of that issue is beyond the scope of this Article.

43. This is sometimes referred to as "partial claiming." *See, e.g.*, Burstein, *Costly Designs, supra* note 1, at 114 n.49. It may be more accurately referred to as "fragment claiming." However, a full discussion of this nomenclature issue is beyond the scope of this Article.

material part of the overall design. An applicant is free to claim whatever best serves their strategic purposes.[44]

*3. "Article of Manufacture"*

Ever since Congress passed the first U.S. design patent statute in 1842, the phrase "article of manufacture" has been used to define design patentable subject matter.[45] The interpretation of this phrase under the current Patent Act is discussed in detail below.[46]

## B. CLAIMING DESIGNS

Today, a design patent can contain only one claim.[47] The verbal portion of the claim is pro forma; it "shall be in formal terms to the ornamental design for the article (specifying name) as shown, or as shown and described."[48] The claimed design must be "shown" using drawings or photographs.[49] In a drawing, the claimed design must be shown in solid lines.[50] Any disclaimed matter[51] must be shown in broken lines.[52] Broken lines can also be used to illustrate environmental matter[53] or "to define the bounds of a claimed design . . . when a boundary does not exist in reality in the article embodying the design."[54] In the latter case, "[i]t would be understood that the claimed design extends to the boundary but does not include the boundary."[55] These boundary lines are often, though not always,

44. These types of claims are valuable strategically because they broaden the scope of protection. *See, e.g.*, Michael P.F. Phelps, *Broadening Design Patents to Disclaim Subject Matter: How Little Is Too Much?*, FED. LAW., August 2013, at 12.

45. *See* Act of Aug. 29, 1842, ch. 263, § 3, 5 Stat. 543, 543–44; Act of Mar. 2, 1861, ch. 88, § 11, 12 Stat. 246, 248; Act of July 8, 1870, ch. 230, § 24, 16 Stat. 198, 201; Act of May 9, 1902, ch. 783, 32 Stat. 193, 193 (codified as amended at Rev. Stat. § 4929); Act of July 19, 1952, ch. 950, 66 Stat. 805 (codified at 35 U.S.C. § 171 (2012)); 35 U.S.C. § 171(a) (Supp. I 2013); REVISED STATUTES OF THE UNITED STATES 962 (1st ed. 1875) (reproducing Rev. Stat. § 4929).

46. *See infra* Section III.A.

47. 37 C.F.R. § 1.153 (2016). That was not always the case. From 1870 to 1898, the Patent Office allowed multiple claims in design patents. *See* WILLIAM L. SYMONS, THE LAW OF PATENTS FOR DESIGNS 90 (1914).

48. 37 C.F.R. § 1.153(a) (2016).

49. *See id.*; MPEP, *supra* note 21, at § 1503.02.

50. *See* MPEP, *supra* note 21, at § 1503.01(III) ("Full lines in the drawing show the claimed design.").

51. *See supra* Section II.A.2 (discussing *In re* Zahn, 617 F.2d 261 (C.C.P.A. 1980)).

52. MPEP, *supra* note 21, at § 1503.02(III).

53. *Id.*

54. *Id.*

55. *Id.*

indicated using dot–dash lines.[56] No verbal description of the design is required; however, if certain drawing conventions are used, their use must be described in the specification.[57]

### C. DESIGN PATENT INFRINGEMENT

Like utility patents, a design patent is infringed by anyone who makes, uses, sells, offers to sell, or imports the patented invention without permission of the patentee.[58] To determine whether an accused product embodies "the patented invention," however, courts do not use the "all elements" test used in utility patent cases.[59] Instead, courts use a specialized design patent infringement test.

The contemporary test for design patent infringement was announced by the en banc Federal Circuit in its 2008 decision in *Egyptian Goddess, Inc. v. Swisa, Inc.*[60] Under *Egyptian Goddess*, a design patent is infringed when "an ordinary observer, familiar with the prior art, would be deceived into thinking that the accused design was the same as the patented design."[61] In this context, "the patented design" means "the claimed design."[62] Therefore, in analyzing infringement, the fact finder must compare the claimed portion of the design—i.e., whatever is shown in solid lines in the patent drawings—to the corresponding portion of the accused design.[63] If the relevant portion looks "the same," in light of the prior art, the patent is infringed.[64]

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56. *See* Sarah Burstein, In re *Owens*, PATENTLY-O (Mar. 29, 2013), http://patentlyo.com/patent/2013/03/in-re-owens.html.

57. *See, e.g.*, MPEP, *supra* note 21, at § 1503.02(III).

58. 35 U.S.C. § 271(a) (2012); *see also* 35 U.S.C. § 171(b) (Supp. I 2013) ("The provisions of this title relating to patents for inventions shall apply to patents for designs, except as otherwise provided.").

59. *See generally* TIP Sys., LLC v. Phillips & Brooks/Gladwin, Inc., 529 F.3d 1364, 1379 (Fed. Cir. 2008) ("Under the 'all elements' rule, to find infringement, the accused device must contain 'each limitation of the claim, either literally or by an equivalent.'" (quoting Freedman Seating Co. v. Am. Seating Co., 420 F.3d 1350, 1358 (Fed. Cir. 2005))).

60. *See* 543 F.3d 665, 672 (Fed. Cir. 2008) (en banc).

61. *Id.* at 672.

62. *See, e.g.*, *id*. (indicating that the infringement analysis should compare "the *claimed* and accused designs") (emphasis added).

63. *See, e.g.*, Hutzler Mfg. Co. v. Bradshaw Int'l, Inc., No. 1:11-cv-07211, 2012 WL 3031150, at *9-10 (S.D.N.Y. July 24, 2012).

64. *See Egyptian Goddess*, 543 F.3d at 672; *see also* Burstein, *The Patented Design*, *supra* note 1, at 166 (discussing the role of the prior art in this analysis). In *Egyptian Goddess*, the Federal Circuit incorporated some of the language from—and suggested that it was adopting—the test announced by the Supreme Court in *Gorham Manufacturing Co.*

## III. THE "ARTICLE OF MANUFACTURE" TODAY

The phrase "article of manufacture" appears in two key provisions of the Patent Act—§ 171, which defines the scope of design patentable subject matter,[65] and § 289, which provides design patent owners with an additional remedy for certain acts of infringement.[66] This Section discusses how courts have interpreted the phrase "article of manufacture" in both of these contexts.

### A. STATUTORY SUBJECT MATTER

The statutory language that defines design patentable subject matter—that design patents will be available for "any new, original, and ornamental design for an article of manufacture"—has not changed since 1902.[67] When the Patent Act was overhauled in 1952, Congress codified this language in 35 U.S.C. § 171, where it remains to this day.[68] Over the past fifty years, specialized patent courts and the USPTO have interpreted the phrase "article of manufacture" in § 171 quite broadly.

#### *1.* In re *Hruby (1967)*

In *Hruby*, the CCPA held, with little support or analysis, design patents for patterns "formed by continually moving droplets of water in a

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*v. White*. *See id*. at 678, 683 (citing Gorham Mfg. Co. v. White, 81 U.S. 511 (1871)). However, the contemporary test differs from *Gorham* in at least one important respect. The *Gorham* test, as it was understood in the late nineteenth century, required the factfinder to compare the entire article "invented and produced" by the patentee to the entire article sold or manufactured by the defendant, regardless of the patent's claim language. *See, e.g.*, Jennings v. Kibbe, 10 F. 669, 670–71 (C.C.S.D.N.Y. 1882); *Ex parte* Gérard, 1888 Dec. Comm'r Pat. 37, 45. The current test for design patent infringement does *not* require an article–level comparison when the patent disclaims portions of a design. *See supra* notes 62–63 and accompanying text. The shift from a full–article comparison to a claimed–portion comparison occurred sometime prior to *Egyptian Goddess*. *See, e.g.*, *id*.; E. Am. Trio Prod., Inc. v. Tang Elec. Corp., 97 F. Supp. 2d 395, 405 (S.D.N.Y. 2000). However, a full exploration of the timing and circumstances of this change is beyond the scope of this Article.

65. *See supra* Section II.A.3.

66. *See* 35 U.S.C. § 171(a) (Supp. I 2013); 35 U.S.C. § 289 (2012).

67. *See supra* Section II.A.

68. An Act to Revise and Codify the Laws Relating to Patents and the Patent Office and to Enact the Laws into Title 35 of the United States Code, Pub. L. No. 82-593, ch. 950, 66 Stat. 792 (1952). In 2013, Section 171 was divided into three subparts, among other changes not relevant to this Article, as part of the America Invents Act; however, the relevant language did not change. *Compare* 35 U.S.C. § 171 (2012), *with* 35 U.S.C. § 171(a) (Supp. I 2013), *as amended by* Pub. L. No. 112-211, § 202(a), 126 Stat. 1527, 1535 (2012).

fountain"[69] satisfied the "article of manufacture" requirement of § 171.[70] In doing so, the court suggested anything "made by man" would qualify as an article of manufacture.[71] In its decision, the CCPA did not mention any of the prior judicial or administrative interpretations of the phrase "article of manufacture."[72]

*2.* In re *Zahn (1980)*

Even though the CCPA's decision in *Zahn* turned on the definition of the word "design,"[73] *Zahn* changed how many thought about the phrase "article of manufacture." Following *Zahn*, an applicant can disclaim any portion—or portions—of a configuration design using dotted lines.[74] Conceptually, the *Zahn* rule can be viewed two ways; it could be understood as allowing applicants to claim only *part* of a design for the configuration of an article of manufacture or as allowing applicants to claim a complete design for the configuration of *part* of an article of manufacture. Thus, some commentators have read *Zahn* as redefining "article of manufacture" to include "part of an article."[75]

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69. *In re* Hruby, 373 F.2d 997, 1002 n.1 (C.C.P.A. 1967) (Worley, C,J., dissenting) ("Appellant concedes that[:] 'Each application here under consideration is a design formed by continually moving droplets of water in a fountain. . . . Although there is a spray head and a catch basin, these mechanical appurtenances do not form a part of the design.'" (emphasis omitted)).

70. *Id.*

71. *Id.* at 1000 ("The fountains are certainly made by man (manufactured) for sale to and use by such buyers.").

72. There were, in fact, prior interpretations. *See infra* Section IV.

73. *See supra* Section II.A.2; *see also* Janice M. Mueller, *Essay: The Supreme Court Reinstates Apportionment of Design Patent Infringers' Total Profits for Multicomponent Products*, *in* 2 MUELLER ON PATENT LAW § 23.04[B] (forthcoming 2017) ("*Zahn* did *not* redefine 'article of manufacture' to mean something less than the complete product sold to consumers."), https://ssrn.com/abstract=2882765. Nonetheless, the CCPA relied on *Hruby*—a case about the meaning of "article of manufacture"—in support of its decision in *Zahn*. *See In re* Zahn, 617 F.2d 261, 268 (C.C.P.A. 1980) ("In *In re Hruby*, the shape of the water sprayed by a fountain was held proper design patent subject matter, indicative of a liberal construction of § 171." (internal citation omitted)).

74. *See* Burstein, *Costly Designs*, *supra* note 1, at 114–115 (discussing contemporary claiming practices and rules).

75. *See, e.g.*, Kevin E. Mohr, *At the Interface of Patent and Trademark Law: Should A Product Configuration Disclosed in a Utility Patent Ever Qualify for Trade Dress Protection?*, 19 HASTINGS COMM. & ENT. L.J. 339, 357 n.69 (1997) (stating that *Zahn* held that "part of an article—the shank of a drill bit—qualifies as an 'article of manufacture'"). Indeed, throughout its opinion, the CCPA referred to the drill bit as the relevant "article of manufacture," but repeatedly referred to the claim as covering a design *for* "the shank

### *3. The GUI Guidelines*

In the mid–1990s, the USPTO decided that graphical user interface ("GUI") designs constitute proper statutory subject matter for design patents.[76] According to the USPTO, "[c]omputer-generated icons, such as full screen displays and individual icons" are "surface ornamentation" and as long as "an application claims a computer-generated icon shown on a computer screen, monitor, other display panel, or a portion thereof, the claim complies with the 'article of manufacture' requirement of 35 U.S.C. 171."[77] This interpretation of the statute is based on questionable logic[78] and has not been tested in litigation or ratified by any court.[79] Nonetheless, the USPTO continues to grant design patents for these types of designs at a rapid pace.[80]

The USPTO does not require a design patent applicant to show or even identify what type of device the screen—or other type of display panel—is attached to or incorporated into.[81] According to the USPTO, the relevant "article of manufacture" is the screen itself, not the device that generates the GUI display.[82]

## B. REMEDY

Design patent owners are entitled to almost all of the remedies available to utility patent owners.[83] For example, a design patent owner may obtain injunctive relief under 35 U.S.C. § 283 and recover damages under 35

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portion," not a design *for* a drill bit. *Compare, e.g.*, *Zahn*, 617 F.2d at 267, *with, e.g.*, *id.* at 263.

76. *See* Seymour & Torrance, *supra* note 11, at 206–14 (criticizing this shift); Jason J. Du Mont & Mark D. Janis, *Virtual Designs*, 17 STAN. TECH. L. REV. 107, 123–28 (2013) (applauding this shift).

77. MPEP, *supra* note 21, at § 1504.01(a)(I).

78. *See e.g.*, Seymour & Torrance, *supra* note 11, at 206–14 (criticizing the USPTO's current policy regarding GUI designs). There are a number of other problems with the USPTO's policy regarding GUI designs; however, a full discussion of those problems is beyond the scope of this Article.

79. To the best of the author's knowledge, *Apple v. Samsung* was the first case in which a GUI design patent was actually asserted in court. It is certainly the first such case litigated to a published decision.

80. *See* Du Mont & Janis, *supra* note 76, at 129 ("Virtual designs are among the fastest growing segments of design patent filings at the USPTO.").

81. *See* MPEP, *supra* note 21, at § 1504.01(a).

82. *See id. But see* Lance L. Vietzke, *Software As the Article of Manufacture in Design Patents for Icons*, 21 AIPLA Q.J. 138, 139 (1993) ("This Article argues that the software which produces an icon is the article of manufacture.").

83. *See supra* note 1.

U.S.C. § 284.[84] Section 289 provides an additional remedy for certain acts of design patent infringement.[85] It states that:

> Whoever during the term of a patent for a design, without license of the owner, (1) applies the patented design, or any colorable imitation thereof, to any *article of manufacture* for the purpose of sale, or (2) sells or exposes for sale any *article of manufacture* to which such design or colorable imitation has been applied shall be liable to the owner *to the extent of his total profit*, but not less than $250, recoverable in any United States district court having jurisdiction of the parties.
>
> Nothing in this section shall prevent, lessen, or impeach any other remedy which an owner of an infringed patent has under the provisions of this title, but he shall not twice recover the profit made from the infringement.[86]

This provision was enacted in its current form when the Patent Act was overhauled in 1952.[87] The Federal Circuit did not, however, interpret the phrase "article of manufacture" in § 289 until 2015.[88]

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84. *See generally* 35 U.S.C. § 171(b) (Supp. I 2013).

85. *See* Burstein, *Costly Designs*, *supra* note 1, at 118–19.

86. 35 U.S.C. § 289 (2012) (emphasis added).

87. *See* Act of July 19, 1952, ch. 950, 66 Stat. 797, 813–14. Although this language differs somewhat from the language of the 1887 Act, it does not appear that Congress meant to materially change the meaning of the remedy provision. 1–23 DONALD S. CHISUM, CHISUM ON PATENTS § 23.02 (2015) ("In the Patent Act of 1952, the design patent statutes were carried forward without substantive change in Sections 171, 172, 173, and 289." (parenthetical omitted)); *see also* Brief for the United States as Amicus Curiae Supporting Neither Party at 13, Samsung Elecs. Co. v. Apple Inc., 137 S. Ct. 429 (2016) (No. 15-777), 2016 WL 3194218 [hereinafter Gov't Brief] ("In 1952, when Congress reenacted the 'total profit' standard in Section 289, it did not materially alter the statutory text or suggest any disagreement with the settled understanding of that language." (citing *Patent Law Codification and Revision: Hearings on H.R. 3760 Before Subcomm. No. 3 of the Comm. on the Judiciary*, 82d Cong., 1st Sess. 109–10 (1951) (statement of P.J. Federico, U.S. Patent Office))).

88. Although the Federal Circuit decided other cases involving awards of profits pursuant to § 289 where the patent–in–suit claimed less than an entire product configuration, the meaning of the phrase "article of manufacture" was not disputed in those prior cases. *See* Alan Tracy, Inc. v. Trans Globe Imports, Inc., 60 F.3d 840, 1995 WL 331109, at *2 (Fed. Cir. 1995); Nike, Inc. v. Wal-Mart Stores, Inc., 138 F.3d 1437 (Fed. Cir. 1998). In *Nike*, the Federal Circuit discussed the history and purpose of § 289 but did not actually address—let alone decide—how to interpret "article of manufacture." 138 F.3d at 1441–43. In *Nike*, the patent–in–suit only claimed a design for a shoe upper but the parties agreed that, if Nike was entitled to profits, it was entitled to the profits from the whole shoe. *See Nike*, 138 F.3d at 1447; Nike Inc. v. Wal-Mart Stores Inc., No. 1:96-cv-00038, 1996 WL 754076, at *3 (E.D. Va. Nov. 18, 1996) (noting that the parties had

This Section discusses the two decisions in which the Federal Circuit first interpreted this key phrase. It then discusses how the Supreme Court rejected the Federal Circuit's interpretation.

*1. The Federal Circuit's Interpretation*

a) *Apple v. Samsung*

Apple claimed, inter alia, that Samsung infringed three different design patents for smartphones.[89] The jury found the three patents were not invalid and each had been infringed by at least one of the nineteen accused Samsung phones.[90]

Two of the patents claimed partial designs for smartphones.[91] The first, U.S. Patent No. D618,677 ("the D'677 patent"), claimed the configuration and coloring of the flat, black front face of the iPhone, excluding the home button[92]:

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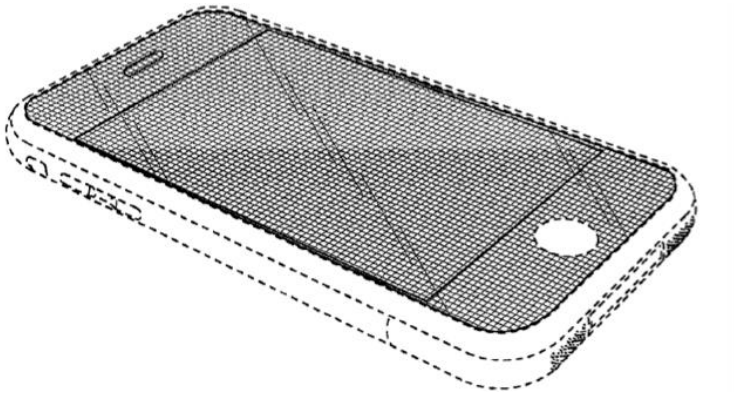
"stipulated to the amount of sales of shoes" and making no mention of any controversy over whether Nike was entitled to the profits for the whole shoe or just the upper); *id*. at *1 (listing "the issues presented" and making no mention of an "article of manufacture" dispute); *see also* Shoe Upper, U.S. Patent No. D348,765 (issued July 19, 1994). So the issue of whether Nike was, in fact, entitled to the profits for the whole shoe was not before the Federal Circuit. Indeed, the parties made no mention of any "article of manufacture" dispute in their briefing before the Federal Circuit. *See* Brief for Defendants-Appellants Wal-Mart Stores, Inc. and Hawe Yue, Inc., Nike, Inc. v. Wal-Mart Stores, Inc., 138 F.3d 1437 (Fed. Cir. 1998) (No. 97-1173), 1997 WL 33544935; Brief of the Plaintiff-Appellee Nike, Inc., Nike, Inc. v. Wal-Mart Stores, Inc., 138 F.3d 1437 (Fed. Cir. 1998) (No. 97-1173), 1997 WL 33544933; Reply Brief for Defendants-Appellants Wal-Mart Stores, Inc. and Hawe Yue, Inc., Nike, Inc. v. Wal-Mart Stores, Inc., 138 F.3d 1437 (Fed. Cir. 1998) (No. 97-1173), 1997 WL 33544931. Therefore, *Nike* did not decide—let alone hold—that the owner of a design patent for a partial design is entitled to the profits for the entire infringing product. *See generally* BRIAN A. GARNER ET. AL., THE LAW OF JUDICIAL PRECEDENT § 23 (2016) (noting a general "rule that a court won't normally accept as binding precedent a point that was passed by in silence, either because the litigants never brought it up or because the court found no need to discuss it").

89. *See* Amended Verdict Form, Apple Inc. v. Samsung Elecs. Co., No. 5:11-cv-01846 (N.D. Cal. Aug. 24, 2012), ECF 1931 [hereinafter Verdict].

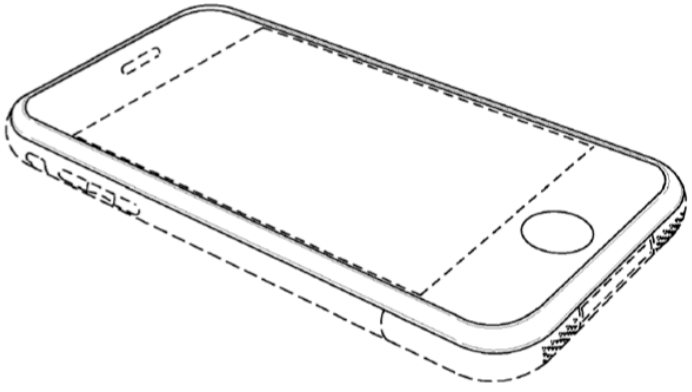
90. *Id*. at 6–7. Apple did not claim that all nineteen Samsung phones infringed all three design patents. *Id*.

91. By "partial design," I mean a design that is defined to include something less than the entire configuration or surface ornamentation of a particular product.

92. Electronic Device, U.S. Patent No. D618,677 fig.1 (issued June 29, 2010). This patent is currently undergoing ex parte reexamination. The Patent Office issued a non–final rejection of that claim in August 2015; Apple has been trying to get that decision vacated ever since. *See In re* Andre et al., Reexamination Control No. 90/012,884 (U.S. Patent & Trademark Office Decision Denying Petition Under 37 CFR 1.181(a)(3), Oct. 3, 2016) (on file with the Berkeley Technology Law Journal).



The jury found that twelve of the accused Samsung phones infringed the D'677 patent.[93] The second patent, U.S. Patent No. D593,087 ("the D'087 patent"), claimed a design for the configuration of the front, flat screen of the iPhone and the bezel[94]:



The jury found that three of the accused Samsung phones infringed the D'087 patent.[95] The third patent, U.S. Patent No. D604,305 ("the D'305 patent"), claimed this design for a screenshot from the iPhone GUI[96]:

93. Verdict, *supra* note 89, at 6.

94. Electronic Device, U.S. Patent No. D593,087 fig.1 (issued May 26, 2009). Although some of the embodiments claimed in this patent included the home button and/or the capsule–shaped speaker, Judge Koh did not construe the claim to require any of these elements. *See* Final Jury Instruction at No. 43, Apple Inc. v. Samsung Elecs. Co., No. 5:11-cv-01846 (N.D. Cal. Aug. 21, 2012), ECF 1903 [hereinafter Apple Jury Instructions].

95. Verdict, *supra* note 89, at 6.

96. Graphical User Interface for a Display Screen or Portion Thereof, U.S. Patent No. D604,305 fig.2 (issued Nov. 17, 2009). This color version of the second embodiment was obtained from an expert report. *See* Expert Report of Susan Kare at 10, Apple Inc. v. Samsung Elecs. Co., 920 F. Supp. 2d 1079 (N.D. Cal. June 1, 2012) (No. 5:11-cv-01846), ECF 927-25.


The jury found that thirteen of the accused Samsung phones infringed the D'305 patent.[97]As can be seen from these illustrations, none of the asserted phone patents claimed a design for an entire phone.[98] Nonetheless, the jury awarded Apple all profits that Samsung made from every phone the jury found infringed any of the three design patents.[99] In doing so, the jury followed Judge Koh's instruction that: "If you find infringement by any Samsung defendant, Apple is entitled to all profit earned by that defendant on sales of articles that infringe Apple's design patents."[100] In that instruction, Judge Koh used the word "article" as a synonym for "product."[101]

On appeal, the Federal Circuit found "no legal error in the jury instruction on the design patent damages."[102] The court held, "[i]n reciting

97. Verdict, *supra* note 89, at 7.

98. Apple argues that, when considered as a group, they "protect the overall look-and-feel of the iPhone." Brief in Opposition to Petition for a Writ of Certiorari at 31, Apple Inc. v. Samsung Elecs. Co., 136 S. Ct. 1453 (2016) (No. 15-777), 2016 WL 6599923 [hereinafter Apple Cert. Br.]; *see also* Brief for Respondent at 54, Apple Inc. v. Samsung Elecs. Co., 137 S. Ct. 429 (2016) (No. 15-777), 2016 WL 4073686 [hereinafter Apple Merits Br.]. Even if that were correct, Apple only claimed that four of the nineteen accused Samsung phones infringed all three of these design patents and the jury only found that three Samsung phones infringed all three design patents. Verdict, *supra* note 89, at 6–7.

99. *See* Apple Inc. v. Samsung Elecs. Co., 786 F.3d 983, 1001 (Fed. Cir. 2015), *cert. granted in part*, 136 S. Ct. 1453 (2016) (mem.) ("Samsung argues that the district court legally erred in allowing the jury to award Samsung's entire profits on its infringing smartphones as damages.").

100. Apple Jury Instructions, *supra* note 94, at No. 54.

101. *See id.*

102. *Apple*, 786 F.3d at 1002.

that an infringer 'shall be liable to the owner to the extent of [the infringer's] total profit,' Section 289 explicitly authorizes the award of total profit from the article of manufacture bearing the patented design."[103]

The Federal Circuit rejected Samsung's argument that the relevant "article of manufacture" could be something less than "the entire infringing product."[104] The court repeatedly used the phrase "article of manufacture" as a synonym for "product"[105] in distinguishing *Apple v. Samsung* from prior cases[106]:

> Samsung contends that [in the *Piano Cases*] the Second Circuit had "allowed an award of infringer's profits from the patented design of a piano case but not from the sale of the entire piano." These Second Circuit opinions, however, addressed a factual situation where "[a] purchaser desiring a piano of a particular manufacturer may have the piano placed in any one of several cases dealt in by the maker." That factual situation occurred in the context of the commercial practice in 1915 in which ordinary purchasers regarded a piano and a piano case as distinct articles of manufacture. The facts at hand are different. The innards of Samsung's smartphones were not sold separately from their shells as distinct articles of manufacture to ordinary purchasers. We thus do not agree with Samsung that these Second Circuit cases required the district court to limit the damages for design patent infringement in this case.[107]

Samsung argued "in the *Piano Cases*, the Second Circuit construed the term 'article of manufacture' as distinct from the entire product as sold."[108] In

103. *Id*. at 1001–02 (alteration in original) (referring to 35 U.S.C. § 289 (2012)). Of course, the statute does not "explicitly" say that the patent owner is entitled to "total profit *from the article of manufacture bearing the patented design*." *Compare id*., *with* 35 U.S.C. § 289 (2012). But this does seem to be a fair reading of the statute and it is consistent with the explicit language of the 1887 Act. *See* Act of Feb. 4, 1887, ch. 105, 24 Stat. 387, 387.

104. *Apple*, 786 F.3d at 1002 ("Samsung argues for limiting the profits awarded to 'the portion of the product as sold that incorporates or embodies the subject matter of the patent.'" (quoting Opening Brief for Defendants-Appellants at 38, Apple Inc. v. Samsung Elecs. Co., 786 F.3d 983 (Fed. Cir. 2015) (Nos. 2014-1335, 2014-1368), 2014 WL 2586819, ECF 33 [hereinafter Samsung App. Br.])).

105. *See supra* note 4 (defining "product" as "something sold by an enterprise to its customers").

106. *See* Samsung App. Br., *supra* note 104, at 38 (referring to Bush & Lane Piano Co. v. Becker Bros., 222 F. 902 (2d Cir. 1915) and Bush & Lane Piano Co. v. Becker Bros., 234 F. 79 (2d Cir. 1916) as "the *Piano Cases*").

107. *Apple*, 786 F.3d at 1002 (internal citations omitted).

108. Samsung App. Br., *supra* note 104, at 38.

making this argument, Samsung viewed "the entire piano" as the product.[109] But the Federal Circuit seemed to view the piano case and internal piano mechanism as separate products—in other words, as items that were "sold separately" to the defendants' customers.[110] According to the Federal Circuit, that meant that the piano cases themselves were the relevant "articles of manufacture" for the purposes of § 289.[111]

Thus, in *Apple v. Samsung*, the Federal Circuit interpreted the phrase "article of manufacture" in § 289 as a synonym for the infringing product—i.e., as a synonym for whatever the defendant "sold separately . . . to ordinary purchasers."[112] However, the Federal Circuit never explained why "article of manufacture" should be interpreted that way, other than to suggest it was the statute's plain meaning.[113] And the court never mentioned its own precedents interpreting the phrase "article of manufacture" in § 171.[114]

b) *Nordock v. System*s

The Federal Circuit reaffirmed its interpretation of § 289 a few months later in *Nordock v. Systems*.[115] Nordock sued a competitor for infringement of U.S. Patent No. D579,754 ("the D'754 patent").[116] The D'754 patent claimed design for a "Lip and Hinge Plate for a Dock Leveler."[117] A representative drawing from the D'754 patent is shown below[118]:

109. *See id*.

110. *Apple*, 786 F.3d at 1002; *see also supra* note 4 (defining "product" as "something sold by an enterprise to its customers").

111. *Apple*, 786 F.3d at 1002.

112. *See id*. Unfortunately, the court failed to make this interpretation as explicit as it might have. Nonetheless, for the reasons discussed above, it is clear that the Federal Circuit interpreted "article of manufacture" to mean "infringing product." *See id.* at 1001–02; Gov't Brief, *supra* note 87, at 16 ("The court below appears to have assumed that the relevant 'article of manufacture' is necessarily the final product as sold in commerce.").

113. *See Apple*, 786 F.3d at 1002 (referring to "[t]he clear statutory language").

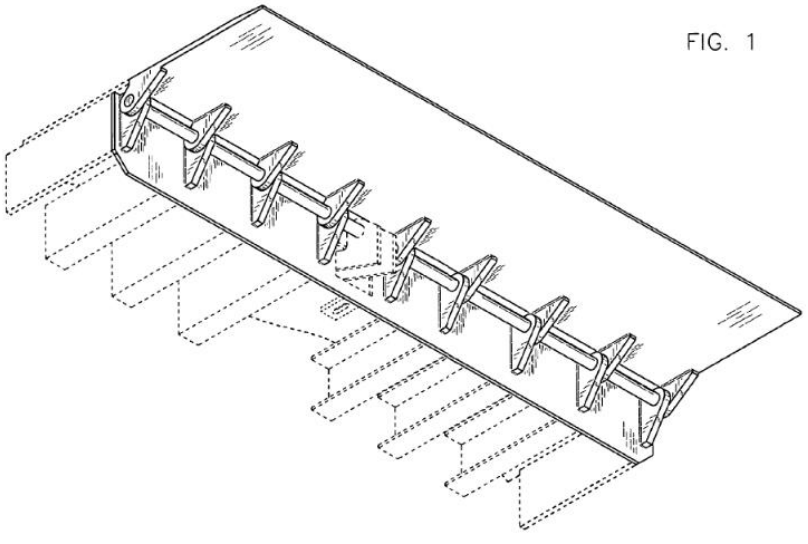
114. *Compare id*., *with* Section II.A.2, *supra*.

115. Nordock, Inc. v. Sys. Inc., 803 F.3d 1344, 1344–45 (Fed. Cir. 2015).

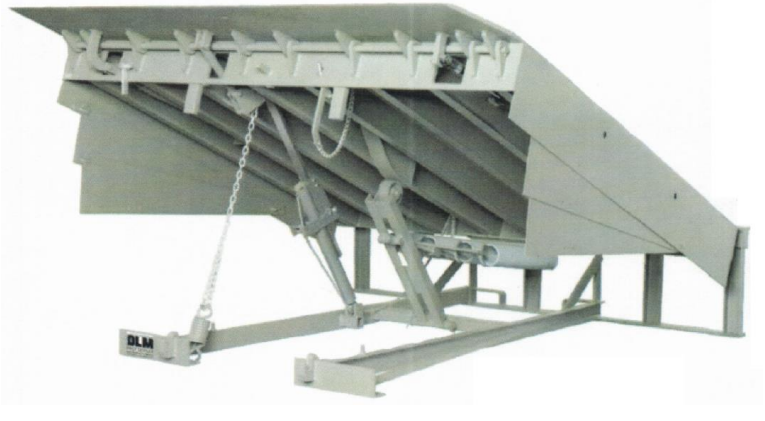
116. *Id*. at 1347.

117. U.S. Patent No. D579,754 (issued Nov. 4, 2008).

118. *Id*. at fig.1.




The accused products were dock levelers, including the one shown below[119]:




119. Complaint, Exhibit C, Nordock, Inc. v. Sys. Inc., 927 F. Supp. 2d 577 (E.D. Wis. Jan. 28, 2011) (No. 11–C–118), 2011 WL 444979.

Systems "began selling the accused levelers in October 2005."[120] Nordock applied for the D'754 patent on May 31, 2007, as a continuation of an unsuccessful utility patent application.[121] The D'754 patent was issued on November 4, 2008.[122] Nordock sued Systems in 2011.[123]

At trial, the jury found that Systems had infringed the D'754 patent.[124] The jury also found that Systems had made no profits from the infringing products and "awarded Nordock $46,825 as a reasonable royalty."[125]

On appeal, the Federal Circuit vacated the jury's award and remanded for a new trial on damages.[126] In doing so, the court rejected Systems' argument "that Nordock [was] not entitled to recover profits on the entire dock leveler, but rather only those profits attributable to the 'lip and hinge plate' shown in the D'754 Patent."[127] According to the court:

> The D'754 Patent is entitled "Lip and Hinge Plate for a Dock Leveler," and *makes clear that the claimed design is applied to and used with a dock leveler*. And, as Nordock points out, the evidence and testimony at trial demonstrated that *the levelers are welded together*. Importantly, there was *no evidence that Systems sold a "lip and hinge plate" separate from the leveler as a complete unit*. We therefore reject Systems' attempts to apportion damages to the lip and hinge plate where it is clear that the article of manufacture at issue is a dock leveler.[128]

120. *Nordock*, 803 F.3d at 1349.

121. *See* U.S. Patent No. D579,754 (filed as Application No. 29/288,137); U.S. Patent Application No. 29/288,137 ("This application is a continuation of Application No. 11/179,941 filed July 12, 2005 . . . ."); Non–Final Rejection, U.S. Patent Application No. 11/179,941 (Mar. 23, 2007) (rejecting all then–pending claims as obvious over the prior art) (on file with the Berkeley Technology Law Journal). *But see Nordock*, 803 F.3d at 1348 (incorrectly characterizing the application that matured into the D'754 patent as a "divisional application"). Nordock abandoned the '941 utility patent application in November 2007. Notice of Abandonment, U.S. Patent Application No. 11/179,941 (Nov. 14, 2007).

122. U.S. Patent No. D579,754.

123. Complaint, Nordock, Inc. v. Sys., Inc., 927 F. Supp. 2d 577 (E.D. Wis. Jan. 28, 2011) (No. 11–C–118), 2011 WL 444979.

124. *Nordock*, 803 F.3d at 1347.

125. *Id*. at 1353.

126. *Id*. at 1362.

127. *Id*. at 1354 ("Section 289 explicitly authorizes the award of total profit from the article of manufacture bearing the patented design." (quoting Apple Inc. v. Samsung Elecs. Co., 786 F.3d 983, 1001–02 (Fed. Cir. 2015) (internal quotation marks omitted))).

128. *Id*. at 1355 (internal citation omitted) (emphasis added).

Thus, as in *Apple*, the court interpreted the phrase "article of manufacture" to mean "the infringing product"—i.e., as whatever the defendant "sold . . . separate[ly]" to its customers.[129]

*2. The Supreme Court's Interpretation*

Samsung and Systems both petitioned the United States Supreme Court for certiorari on the issue of how to interpret § 289.[130] The Court granted Samsung's petition on March 21, 2016.[131] Specifically, the Court granted certiorari on the following issue: "Where a design patent is applied to only a component of a product, should an award of infringer's profits be limited to those profits attributable to the component?"[132] By the time the case was fully briefed, Apple, Samsung, and the United States, participating as amicus curiae, all agreed "that the relevant 'article of manufacture' could be something less than the entire infringing product."[133] They disagreed, however, about when—or whether—that fact should affect a patentee's ability to recover the "total profit" from the infringing product.[134]

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129. *Id.*; *see also id*. at 1354 (criticizing Systems' damages expert, Bero, for limiting his analysis "to the 'lip and hinge plate' portion of the dock levelers" because "[i]n doing so, Bero ignored the fact that total profits are based on the article of manufacture to which the D'754 Patent is applied—not just a portion of that article of manufacture"). The Federal Circuit also suggested that its decision was based on, if not compelled by, its 1998 decision in *Nike v. Wal-Mart*. *See id.* ("[T]his court has interpreted § 289 to require 'the disgorgement of the infringers' profits to the patent holder, such that the infringers retain no profit from their wrong.'") (citing Nike Inc. v. Wal-Mart Stores, Inc., 138 F.3d 1437, 1448 (Fed. Cir. 1998)). It is true that in *Nike* the Federal Circuit expressed concern "that the infringers retain no profit from their wrong." *Nike*, 138 F.3d at 1448. But it did so in the context of deciding whether to award pre–tax or post–tax profits—not in deciding what was the relevant "article of manufacture." *See id*. Moreover, in assuming that Systems' "wrong" was profiting from the entire dock leveler, the *Nordock* court begged the disputed question. And unlike Wal-Mart, Systems disputed that the whole product was the relevant "article" for the purposes of § 289. For more on *Nike*, see *supra* note 88.

130. Petition for a Writ of Certiorari, Samsung Elecs. Co. v. Apple Inc., 136 S. Ct. 1453 (2016) (No. 15-777), 2015 WL 10435543 [hereinafter Samsung Pet.]; Petition for a Writ of Certiorari, Sys., Inc. v. Nordock Inc., 137 S. Ct. 589 (2016) (mem.) (No. 15-978), 2016 WL 386728.

131. *Samsung*, 136 S. Ct. at 1453.

132. Samsung Pet., *supra* note 130, at (i). Samsung actually raised two issues in its petition but the Court denied *certiorari* on the other issue. *See* Samsung Elecs. Co. v. Apple Inc., 136 S. Ct. 1453 (2016) (mem.) (limiting grant of review to Question 2).

133. Sarah Burstein, Samsung v. Apple*: A View From Inside the Courtroom*, PATENTLY-O (Oct. 12, 2016), http://patentlyo.com/patent/2016/10/samsung-inside-courtroom.html.

134. *See* Brief for Petitioners at 5, Samsung Elecs. Co. v. Apple Inc., 137 S. Ct. 429 (2016) (No. 15-777), 2016 WL 6599922; Gov't Brief, *supra* note 87; Apple Merits Br., *supra* note 98.

The Supreme Court issued its decision in *Samsung v. Apple* on December 6, 2016.[135] In a unanimous decision written by Justice Sotomayor, the Court framed the issue as follows:

> The United States Court of Appeals for the Federal Circuit identified the entire smartphone as the only permissible "article of manufacture" for the purpose of calculating § 289 damages because consumers could not separately purchase components of the smartphones. The question before us is whether that reading is consistent with § 289.[136]

The Court held that it was not.[137] The Court observed that the plain language of § 289 requires disgorgement of "all of the profit made from the prohibited conduct, that is, from the manufacture or sale of the 'article of manufacture to which [the patented] design or colorable imitation has been applied.'"[138] According to the Court, "[a]rriving at a damages award under § 289 . . . involves two steps. First, identify the 'article of manufacture' to which the infringed design has been applied. Second, calculate the infringer's total profit made on that article of manufacture."[139]

Instead, the Court stated that "[t]he only question we resolve today is whether, in the case of a multicomponent product, the relevant 'article of manufacture' must always be the end product sold to the consumer or whether it can also be a component of that product."[140] To answer that question, the Court looked to the definitions of the words "article" and "manufacture," citing one contemporary dictionary and one late nineteenth–century dictionary.[141] Based on these definitions, the Court concluded that "[a]n 'article of manufacture' . . . is simply a thing made by hand or machine."[142] Therefore, the Court concluded that "[t]he term 'article of

135. Samsung Elecs. Co. v. Apple Inc., 137 S. Ct. 429 (2016).

136. *Id*. at 432.

137. *Id.*

138. *Id.* at 434 (quoting 35 U.S.C. § 289 (2012)).

139. *Id*.

140. *Id.* at 434.

141. *Id*. at 434–35 (citing J. STORMONTH, A DICTIONARY OF THE ENGLISH LANGUAGE 53 (1885); AMERICAN HERITAGE DICTIONARY 101 (5th ed. 2011)).

142. *Id*. at 435. This definition is essentially the same as the one suggested by *Hruby*. *Compare id*., *with In re* Hruby, 373 F.2d 997, 999 (C.C.P.A. 1967) (suggesting that an "article of manufacture" is anything "made by man"). But the Court made no mention of *Hruby*. And while the Court stated that its interpretation "of article of manufacture in § 289 is consistent with 35 U.S.C. § 171(a)," the Court did not cite any cases interpreting "article of manufacture" in § 171. *See Samsung*, 137 S. Ct. at 435. Instead, the Court cites *Zahn* and one late nineteenth–century case interpreting Rev. Stat. § 4929. *Id*. (citing *Ex parte*

manufacture,' as used in § 289, encompasses both a product sold to a consumer and a component of that product."[143] The Court refused to formulate a test for lower courts to use in identifying the relevant "article of manufacture."[144] According to the Court, that issue was not sufficiently briefed.[145] Therefore, the Court remanded the case to the Federal Circuit for further proceedings.[146]

Following its decision in *Samsung*, the Court granted Systems' petition for certiorari, vacated the Federal Circuit's judgment, and remanded *Systems v. Nordock* for further proceedings.[147] The Federal Circuit remanded both *Apple* and *Nordock* to their respective district courts.[148]

## IV. THE "ARTICLE OF MANUFACTURE" IN 1887

Congress enacted the predecessor to 35 U.S.C. § 289 in 1887.[149] To evaluate what the phrase "article of manufacture" meant in 1887, this Part explores the meaning of that phrase in the context of statutory subject matter by examining the relevant statutory text, late nineteenth–century patent treatises, Patent Office decisions, and court cases. It also traces the relevant history behind the enactment of the 1887 Act.

### A. STATUTORY SUBJECT MATTER

When Congress enacted the 1887 Act, the phrase "article of manufacture" was not new to U.S. patent law. It had been used for over forty years to define the scope of design patentable subject matter.[150] Given

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Adams, 1898 Dec. Comm'r Pat. 115; *In re* Zahn, 617 F.2d 261, 268 (C.C.P.A.1980)). As discussed above, *Zahn* itself did not purport to interpret "article of manufacture," although some commentators have read it that way. *See supra* note 75 and accompanying text. And *Adams* was interpreting Rev. Stat. § 4949, not § 171. Although Rev. Stat. § 4949 was the predecessor to § 171 and contains the same key phrase, "article of manufacture," it is still strange that the Court ignored the more recent interpretations of that statutory phrase.

143. *Samsung*, 137 S. Ct. at 435.

144. *Id*. at 436.

145. *Id.*

146. *Id*.

147. Sys., Inc. v. Nordock, Inc., 137 S. Ct. 589 (2016) (mem.).

148. Apple Inc. v. Samsung Elecs. Co., 678 F. App'x 1012, 1014 (Fed. Cir. 2017) (per curiam) ("[T]he parties dispute what jury instructions the current trial record supports. Because the district court is better positioned to parse the record to evaluate the parties' competing arguments, we remand for the district court to consider these issues in the first instance."); Nordock, Inc. v. Sys. Inc., 681 F. App'x 965, 966 (Fed. Cir. 2017).

149. Act of Feb. 4, 1887, ch. 105, 24 Stat. 387, 387.

150. *See* Act of Aug. 29, 1842, ch. 263, § 3, 5 Stat. 543, 543–44; Act of Mar. 2, 1861, ch. 88, § 11, 12 Stat. 246, 248; Act of July 8, 1870, ch. 230, § 24, 16 Stat. 198, 201; REVISED

this history, the general rule that "identical . . . terms in statutes should be construed in the same way" is significant in interpreting the 1887 Act.[151] There is no evidence—either in the text of the 1887 Act or in the legislative history—indicating that Congress meant the phrase "article of manufacture" to have a different meaning in the new remedy provision than in the statutory subject matter provision. To understand what Congress meant when it used the phrase "article of manufacture" in the 1887 Act, it is essential to understand how the phrase was understood in the context of statutory subject matter. This Section investigates that question by examining the relevant statutory text, Patent Office decisions, and federal case law.

*1. Statutory Text*

The text of the statutory subject matter provisions for both utility and design patents helps shed light on the meaning of the phrase "article of manufacture" in 1887. The phrase "article of manufacture" has been used to define the scope of design patentable subject matter since the first design patent act was enacted in 1842.[152] By 1842, the word "manufacture" already had a long pedigree in Anglo–American utility patent law.[153] This Section examines the meaning of "manufacture" in the context of nineteenth–century utility patent law, the "article of manufacture" in nineteenth–century design patent law, and how those two categories are related.

a) The "Manufacture" in Utility Patent Law

In 1624, the English Statute of Monopolies defined patentable subject matter as the "working or making of any manner of new manufactures."[154] English courts interpreted the term "manufactures" to include "any species

STATUTES OF THE UNITED STATES 962 (1st ed. 1875) (reproducing Rev. Stat. § 4929 as enacted).

151. Jacob Scott, *Codified Canons and the Common Law of Interpretation*, 98 GEO. L.J. 341, 362 (2010); *see also id.* at 362 n.100 ("A presumption exists that the legislature uses the same term consistently in different statutes." (quoting 2A NORMAN J. SINGER & J.D. SHAMBIE SINGER, STATUTES AND STATUTORY CONSTRUCTION § 46:5 n.10 (7th ed. 2007))).

152. *See supra* Section II.A.3.

153. *See Ex parte* Lewis, 1891 Dec. Comm'r Pat. 61, 62 ("The word 'manufacture' has been employed in statutes relating to the granting of patents ever since the passage of the statute relating to monopolies in the reign of James the First.").

154. *See id.*; *see also* LEWIS EDMUNDS, THE LAW AND PRACTICE OF LETTERS PATENT FOR INVENTIONS 12–13 (2d ed. 1897) (stating that the Statute of Monopolies was passed in 1624 and referring to An Act concerning Monopolies and Dispensations with Penal Laws and the Forfeitures thereof, 21 Jac. I. ch. 8. § 5).

of new manufactured article, or tangible product of industry; or a new machine" as well as "a new method or process."[155]

When Congress enacted the first U.S. patent act in 1790, it imported the statutory term "manufacture" from English law but not the capacious meaning the term had been given by the English courts.[156] In the 1790 Act, Congress defined patentable subject matter as "any useful art, manufacture, engine, machine, or device."[157] Thus, it appears that Congress intended U.S. patent law to cover the same subject matter as English patent law, without torturing the word "manufacture" into covering such a broad range of inventions.[158] After all, if Congress had meant to adopt the English courts' meaning of "manufacture," all of the other categories would have been superfluous.

In 1793, Congress revised the utility patent subject matter provision, redefining statutory subject matter as "any new and useful art, machine, manufacture, or composition of matter, or any new and useful improvement thereof."[159] The utility patent subject matter provision in force in 1887, Revised Statutes § 4886, contained the same language.[160]

By 1887, it was well–established that these "statutory classes of invention"—"art," "machine," "manufacture," and "composition of matter"—were separate categories, "between which the lines of division are sharply drawn."[161] Each of the statutory terms had "a well recognized meaning in the patent laws."[162] An "art" was a "process."[163] A "composition

155. GEORGE TICKNOR CURTIS, A TREATISE ON THE LAW OF PATENTS FOR USEFUL INVENTIONS: AS ENACTED AND ADMINISTERED IN THE UNITED STATES OF AMERICA § 4 (1867); *see also Ex parte* Ackerson, 1869 Dec. Comm'r Pat. 74, 75 ("Under the English law all patentable subject-matter is classed under the phrase 'new manufacture.' Everything, whether it be machine, process, or composition of matter, is grouped under this one title.").

156. *See* ALBERT H. WALKER, TEXT-BOOK OF THE PATENT LAWS OF THE UNITED STATES OF AMERICA § 17 (1885); CURTIS, *supra* note 155, at § 9.

157. *Ex parte* Lewis, 1891 Dec. Comm'r Pat. 61, 62; CURTIS, *supra* note 155, at § 8 (emphasis omitted).

158. *See* CURTIS, *supra* note 155, at § 9.

159. *See Ex parte* Lewis, 1891 Dec. Comm'r Pat. 61, 62 (punctuation omitted).

160. REVISED STATUTES OF THE UNITED STATES 946 (2d ed. 1878) (reproducing Rev. Stat. § 4886, as then in force). This language still remains in effect today, save for the substitution of "process" for "art." *See* 35 U.S.C. § 101.

161. *Ex parte* Blythe, 1885 Dec. Comm'r Pat. 82, 86 (citing to Rev. Stat. § 4886).

162. SYMONS, *supra* note 47, at 28 (citing *Ex parte* Adams, 1898 Dec. Comm'r Pat. 115; *Ex parte* Steck, 1902 Dec. Comm'r Pat. 9).

163. JAMES LOVE HOPKINS, THE LAW OF PATENTS AND PATENT PRACTICE IN THE PATENT OFFICE AND THE FEDERAL COURTS, WITH RULES AND FORMS § 31 (1911).

of matter" was "an artificial substance made up of two or more elements so united as to form a homogeneous whole," such as paint or a medicine.[164]

A "machine" was considered a distinct and separate category of invention.[165] However, coming up with a clear, comprehensive definition of a "machine" proved difficult.[166] In 1853, the Supreme Court rather circularly defined a "machine" as "includ[ing] every mechanical device or combination of mechanical powers and devices" that "perform some function and produce a certain effect or result."[167] In 1863, the Court did not provide much more guidance when it stated "[a] machine is a concrete thing, consisting of parts, or of certain devices and combination of devices."[168] By the late nineteenth century, some treatise writers defined "machine" with reference to motion, seemingly using motion as a proxy for "mechanical." For example, in 1885, the first edition of WALKER ON PATENTS defined "machine" as "a combination of moving mechanical parts, adapted to receive motion, and to apply [that motion] to the production of some mechanical result or results."[169] In 1890, Robinson defined a "machine" as "an instrument composed of one or more of the mechanical powers, and capable, when set in motion, of producing, by its own operation, certain predetermined physical effects."[170] But not all commentators viewed motion as an essential part of a "machine."[171] For example, in 1883, Simonds endorsed a definition that included—but was not limited to—devices with moving parts.[172]

A "manufacture" was most broadly defined as any "'thing' made or manufactured by hand or by machine" that was "not itself a 'machine' or a 'composition of matter.'"[173] According to Robinson, this included "parts of

164. HENRY CHILDS MERWIN, THE PATENTABILITY OF INVENTIONS § 55 (1883); *see also* CURTIS, *supra* note 155, at § 28; WALKER, *supra* note 156, at § 18.

165. *See generally Ex parte* Blythe, 1885 Dec. Comm'r Pat. 82, 86.

166. *See, e.g.*, John L. Seymour, *Of Machines*, 11 J. PAT. OFF. SOC'Y 248, 252 (1929). At least one commentator thought this category was self–explanatory. *See* HORACE PETTIT, THE LAW OF INVENTIONS 42 (1895) ("Every one knows what a machine is.").

167. Corning v. Burden, 56 U.S. 252, 267 (1853).

168. Burr v. Duryee, 68 U.S. 531, 570 (1863).

169. WALKER, *supra* note 156, at § 16.

170. 1 WILLIAM C. ROBINSON, THE LAW OF PATENTS FOR USEFUL INVENTIONS § 173 (1890).

171. *See, e.g.*, CURTIS, *supra* note 155, at § 20; EDWARD S. RENWICK, PATENTABLE INVENTION § 38 (1893); PETTIT, *supra* note 166, at 35.

172. *See* WILLIAM EDGAR SIMONDS, A SUMMARY OF THE LAW OF PATENTS FOR USEFUL INVENTIONS AND FORMS 18 (1883).

173. HENRY HOWSON & CHARLES HOWSON, A BRIEF TREATISE ON UNITED STATES PATENTS, FOR INVENTORS AND PATENTEES 34 (1876).

a machine considered separately from the machine itself, all kinds of tools and fabrics, and every other vendible substance which is neither a complete machine nor produced by the mere union of ingredients."[174] Another commentator gave the following examples of articles of manufacture: "cloths, baskets, articles of clothing, pottery, glassware, nails, screws, etc."[175]

A number of Patent Office decisions indicated that "manufactures" had to be "complete" in the sense of being manufactured, used, or sold separately.[176] For example, in *Ex parte Blanchard*, Commissioner Fisher wrote:

> By the true construction of the word "manufacture," as used in the patent act, it fairly covers only such manufactured articles or products as are *complete in themselves, or, if parts of a whole, are so far complete as to be the subject of separate manufacture and sale*. Thus a lamp chimney is intended to be used with a lamp and not otherwise, nevertheless, it may properly be made, sold, and patented as a new manufacture.
>
> In this case, applicant admits that "this mold board is adapted and applicable only to this single kind of plow." It is, in other words, a mere fraction of a machine. If a material part [of the machine], it may be claimed as such, but it is not, in any proper sense, an article of manufacture.[177]

This analysis suggests that a part of a machine could qualify as a "manufacture" only if that part were capable of being used in more than one type of machine, as opposed to being "adapted and applicable only to [a]

174. ROBINSON, *supra* note 170, at § 183, 270.

175. RENWICK, *supra* note 171, at § 59. Simonds provided a similar list of examples. SIMONDS, *supra* note 172, at 19 ("The word or term 'manufacture' includes most of the ordinary and vendible articles of trade, such as textile fabrics, articles of personal attire, general hardware, house furnishing goods and the like."); *see also* JOSEPH J. DARLINGTON, A TREATISE ON THE LAW OF PERSONAL PROPERTY 232 (1891) (giving "cloths, utensils, implements, shoes, single objects, etc." as examples of "manufactures").

176. *Ex parte* Blanchard, 1870 Dec. Comm'r Pat. 59, 59 ("[T]he word 'manufacture,' as used in the patent act . . . fairly covers only such manufactured articles or products as are complete in themselves, or, if parts of a whole, are so far complete as to be the subject of separate manufacture and sale."); *Ex parte* Campbell, 1872 Dec. Comm'r Pat. 228, 228 (deciding that the applicant's invention was not an "article of manufacture" because it was "not a device or article that he can offer to the public as complete for their use"); *see also* Wilson v. Rousseau, 30 F. Cas. 162, 211–12 (C.C.N.D.N.Y. 1845) (suggesting that something that "may be" used separately constitutes a "separate and distinct" manufacture).

177. *Ex parte* Blanchard, 1870 Dec. Comm'r Pat. 59, 59 (emphasis added).

single kind" of machine, in which case it would be a "mere fraction of a machine."[178] But it is not clear if this was a widely–held view.

*Blanchard* also indicated that a piece of a larger product (including a machine) could qualify as a "manufacture" only if that piece were manufactured separately or could be sold separately.[179] Other decisions reached similar conclusions.[180] Simonds summarized this line of decisions as follows:

> As understood by the Patent Office—and no reason is seen for dissenting from the understanding—*an article does not need to be a finished product in order to enable it to be an "article of manufacture"; the term fairly covers such products as are complete in themselves, or are so far complete as to be subject to independent manufacture and sale*. Thus in a community of boot and shoe manufacturers, certain shops make and sell only certain parts of a boot or shoe, and in such case these parts are "articles of manufacture." Again in a community of clock-makers, certain manufacturers produce but a certain part, clock-springs for

178. *See id.*; *see also generally Ex parte* Howard, 1924 Dec. Comm'r Pat. 75, 76 (suggesting that "clay tiles, beams, bolts, rivets, etc." could, if new, be "patentable as a 'manufacture'" because they are "inherently useful and complete in themselves," even if ultimately used to build something larger, like a roof). *But see Ex parte* Sellers, 1872 Dec. Comm'r Pat. 197, 198 (stating that an "article of manufacture" must be "complete in itself *for some special use*, and not to be applied to general purposes like pipes or tubes" (emphasis added)). Additionally, at least one design patent decision indicated that an "article of manufacture" had to be something fairly specific. *See Ex parte* Proeger, 1891 Dec. Comm'r Pat. 182, 182 ("[I]t would not be advisable to extend the meaning of the word 'manufacture' in the statute to include such a generic term as the word 'tableware.'").

179. *See Ex parte* Blanchard, 1870 Dec. Comm'r Pat. 59, 59.

180. *See Ex parte* Butterfield, 1872 Dec. Comm'r Pat. 153, 154 (deciding that a shoe upper was an "article of manufacture" because it was "an article of trade"—*i.e.*, because it was sold separately, presumably to shoemakers); *Ex parte* Moore, 1871 Dec. Comm'r Pat. 249, 249–51 (deciding that a clock–case was patentable as an "article of manufacture" because it was "intended as an article of trade, not as a clock, but as a clock-case; intended to be put upon the market simply as a clockcase, and sold to clock-makers"); *see also* WILLIAM EDGAR SIMONDS, A DIGEST OF PATENT OFFICE DECISIONS: 1869-1879 at 29 (1880) ("A part of a device is an 'article of manufacture' when separately sold in the trade" (citing *Ex parte* Blanchard, 1870 Dec. Comm'r Pat. 59)); *id*. ("'Manufacture' fairly covers only such products as are complete in themselves, or so far complete as to be subject to independent manufacture and sale" (citing *Ex parte* Butterfield, 1872 Dec. Comm'r Pat. 153)); ROBINSON, *supra* note 170, at § 188, 276 (referring to a "manufacture" as a "finished product").

> instance, and in that case a clock-spring is an "article of manufacture."[181]

The question was not whether a particular patent applicant—or accused infringer—actually sold the item as a freestanding product to the ultimate consumer. Instead, the inquiry focused on whether the item was (or could be) sold to someone, including to another manufacturer, for incorporation of the item into a larger product.

Thus, by 1887, it was clear that "machines" were different than "manufactures" but there was no universally agreed–upon, bright–line test for distinguishing between "manufactures" and "machines."[182] For example, there was some debate over whether tools should be classified as "manufactures" or "machines."[183] There was also some disagreement over the proper classification of pianos.[184] Of course, in the utility patent context, there was little need (or incentive) to spend much time or mental effort developing a test to distinguish between these categories. As long as an invention was clearly either a "manufacture" or a "machine," it did not really matter which one it was—the invention would be patentable either way.[185]

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181. SIMONDS, *supra* note 172, at 19 (emphasis added) (citing *Ex parte* Blanchard, 1870 Dec. Comm'r Pat. 59; *Ex parte* Butterfield, 1872 Dec. Comm'r Pat. 153).

182. WALKER, *supra* note 156, at § 19 ("The distinction between a machine and a manufacture cannot be so stated that its application to every case would be clear and satisfactory to every mind.").

183. *See* HOPKINS, *supra* note 163, at § 32 ("There has been some discussion by text writers as to whether the word 'machine' includes tools." (citing MACOMBER, FIXED LAW OF PATENTS § 768 (1st ed. 1909); ROBINSON, *supra* note 170, at § 175)); *see also* SIMONDS, *supra* note 172, at 18 (suggesting that tools with "fixed and immovable parts, [such] as a hatchet or gimlet" should be considered "manufactures" instead of machines).

184. *Compare Ex parte* Blythe, 1886 Dec. Comm'r Pat. 82, 87 (stating that a piano should be considered a "machine" for the purposes of patent law even though it would seem strange, in normal parlance, to call an apparatus like a piano a "machine"), *with* ROBINSON, *supra* note 170, at § 175, 260 n.1 ("A piano is not a machine, though the mechanism which is constituted by each of its keys, in connection with its own hammer, &c., might be so regarded; nor is a tool or an implement characterized by any *modus operandi*, but is an ordinary manufacture.").

185. *See, e.g.*, HOPKINS, *supra* note 163, at §§ 32–33 (describing the question of what constitutes a "machine" versus a "manufacture" under Rev. Stat. § 4886 as being "largely academic" in the context of utility patents).

b) The "Article of Manufacture" in Design Patent Law

i) The Original Design Patent Act

Congress enacted the first U.S. design patent act in 1842.[186] It defined design patentable subject matter as:

> [A]ny new and original design *for a manufacture*, whether of metal or other material or materials, or any new and original design for the printing of woollen, silk, cotton, or other fabrics, or any new and original design for a bust, statue, or bas relief or composition in alto or basso relievo, or any new and original impression or ornament, or *to be placed on any article of manufacture*, the same being formed in marble or other material, or any new and useful pattern, or print, or picture, to be either worked into or worked on, or printed or painted or cast or otherwise fixed on, *any article of manufacture*, or any new and original shape or configuration of *any article of manufacture* not known or used by others before his, her, or their invention or production thereof . . . .[187]

Thus, under the 1842 Act, most types of protectable designs were designs for (or of) a "manufacture" or an "article of manufacture."

The phrase "article of manufacture" appears to have been borrowed from the 1839 English design copyright statute.[188] That might be taken to suggest that Congress meant to adopt the English courts' interpretations of that phrase.[189] However, it seems reasonably clear that Congress used the word "manufacture" in the new design patent law to mean the same thing it meant in the existing utility patent law. By 1842, the word "manufacture" already had a long history in American patent law.[190] Therefore, normal rules of statutory construction would dictate that it be given the same

186. Act of Aug. 29, 1842, ch. 263, § 3, 5 Stat. 543, 543–44. "Very few design patents were granted under this act, and the books contain no Patent Office decisions, and but three litigated cases in the courts, founded on patents applied for or granted in pursuance of this law." HECTOR T. FENTON, THE LAW OF PATENTS FOR DESIGNS 2 (1889) (citing Root v. Ball, 4 McLean 177; Sparkman v. Higgins, 1 Blatch. 205; Booth v. Garrelly, 1 Blatch. 247).

187. Act of Aug. 29, 1842, ch. 263, § 3, 5 Stat. 543, 543–44 (emphasis added).

188. *See* Jason J. Du Mont & Mark D. Janis, *The Origins of American Design Patent Protection*, 88 IND. L.J. 837, 860–61 (2013).

189. Scott, *supra* note 151 ("The borrowed statute rule states that when a legislature adopts a statute from a foreign jurisdiction, it implicitly incorporates the settled interpretations of the foreign statute's judiciary.").

190. *See supra* Section IV.A.1.a).

meaning in the design patent subject matter provision that it had been given in the utility patent subject matter provision.[191]

Moreover, as discussed above, Congress deliberately avoided adopting the English meaning of the word "manufacture" when it first imported that term into U.S. patent law in 1790. It would be strange for Congress to consciously avoid adopting the English meaning of the word "manufacture" in one part of the Patent Act and silently adopt it in another.

In any case, by 1887, a number of administrative and judicial decisions had expressly equated the phrase "article of manufacture" in the design patent statute with the term "manufacture" in the utility patent statute.[192] And the phrase "article of manufacture" was already being used a synonym for "manufacture" in utility patent law.[193]

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191. *See Ex parte* Lewis, 1891 Dec. Comm'r Pat. 61, 63 ("When . . . the American statute relating to patents was amended by the act of 1842, providing for the granting of design patents, and the word 'manufacture' was studiously employed and repeated therein, the fundamental rules of construction required that the same meaning should be ascribed to the word as used therein which had been associated with it, not only as found in the statute directly amended, but in all preceding statutes relating to Letters Patent and employing the same word."); *see also* Scott, *supra* note 151, at 362 ("Generally, identical or similar terms in statutes should be construed in the same way . . . .").

192. *See, e.g.*, *Ex parte* Sellers, 1872 Dec. Comm'r Pat. 197, 198 (relying solely on utility patent decisions for its definition of "article of manufacture" in the design patent statute); *see also* Pratt v. Rosenfeld, 3 F. 335, 335–36 (C.C.S.D.N.Y. 1880) ("The statute (Rev. Stat. Sec. 4929) authorizes the grant of a patent to any person who, by his own industry, genius, efforts, and expense, has invented and produced any new and original design for a manufacture . . . . The subject of this patent is not covered by this statute unless it is included in the term 'manufacture.'").

193. *See, e.g.*, *Ex parte* Ackerson, 1869 Dec. Comm'r Pat. 74, 74 (discussing a utility patent claim for "a new article of manufacture"); Cone v. Morgan Envelope Co., 6 F. Cas. 268, 269 (C.C.D. Mass. 1879) (describing a utility patent for a "manufacture" as a "patent for a new article of manufacture"); *see also* HOWSON & HOWSON, *supra* note 173, at 34 ("Patents are granted for any new and useful art, machine, manufacture or composition of matter, or any new and useful improvement thereof. It would seem that *the word 'manufacture' is used here in the sense of an article of manufacture* . . ." (emphasis added)). In recent years, the Federal Circuit has called this longstanding understanding of equivalency into question. *See In re* Nuijten, 500 F.3d 1346, 1357 n.9 (Fed. Cir. 2007) (suggesting that a § 101 "manufacture" need not be the same as a § 171 "article of manufacture"). Granted, the court did this in the context of trying to avoid some ill–reasoned—but binding—design patent precedent. *See id.* (attempting to distinguish *In re* Hruby, 373 F.2d 997 (1967)). It is not clear that the traditional understanding was correct; after all, the traditional view gives no meaning at all to the phrase "article of" in the design patent provision. However, a full discussion of that issue is beyond the scope of this Article.

ii) Revised Statutes § 4929

Between 1842 and 1887, the design patent subject matter provision was revised multiple times but none of these revisions significantly changed the scope of the statutory subject matter—at least not in ways that are relevant to this discussion.[194] In 1887, Revised Statutes § 4929 defined the protectable subject matter as:

> [A]ny new and original design *for a manufacture*, bust, statue, alto-relievo, or bas-relief; any new and original design for the printing of woolen, silk, cotton, or other fabrics; any new and original impression, ornament, [pattern], print, or picture to be printed, painted, cast, or otherwise placed on or worked into *any article of manufacture*; or any new, useful, and original shape or configuration of *any article of manufacture* . . . .[195]

This provision, like its predecessors, was interpreted as covering two different types of designs—"configuration" (or "shape") and "ornamentation."[196]

Section 4929 of the Revised Statues, like its predecessors, used the well–established terms of art "manufacture" and "article of manufacture" to describe the protectable subject matter.[197] As one early 20th century treatise writer explained:

> The terms "art", "machine", "manufacture", and "composition of matter" have a well recognized meaning in the patent laws. While section 4886, Revised Statutes permits the grant of a patent for

194. *Compare* Act of Aug. 29, 1842, ch. 263, § 3, 5 Stat. 543, 543–44, *with* Act of Mar. 2, 1861, ch. 88, § 11, 12 Stat. 246, 248, *and* Act of July 8, 1870, ch. 230, § 24, 16 Stat. 198, 201, *and* REVISED STATUTES OF THE UNITED STATES 962 (1st ed. 1875) (reproducing Rev. Stat. § 4929); *see also generally* WILLIAM EDGAR SIMONDS, THE LAW OF DESIGN PATENTS 179–80 (1874) (noting the lack of major substantive change between the 1842, 1861, and 1870 acts.).

195. REVISED STATUTES OF THE UNITED STATES 954 (2d ed. 1878) (reproducing Rev. Stat. § 4929, as then in force) (emphasis added); *see also* WALKER, *supra* note 156, at § 20 (explaining that the word "patent" in the phrase "impression, ornament, patent, print, or picture" appeared to be a typo).

196. *Ex parte* Gérard, 1888 Dec. Comm'r Pat. 37, 40 (describing "the two classes of invention" in design patents as "shape and ornamentation"); *see also* ROBINSON, *supra* note 170, at § 204 (explaining that a "design may consist in the simple configuration of a substance the form given to it as a whole, or in the ornamentation imposed upon it without reference to its general form, or in such configuration or ornamentation both" in a section entitled "Design may Consist in Configuration or Ornamentation or Both").

197. *See* Rev. Stat. § 4929; *see also* FENTON, *supra* note 186, at 183 (interpreting each of the three clauses of Section 4929 as pertaining to designs for "articles of manufacture" or "manufacture[s]").

> any new invention in any of them, section 4929 names only a "manufacture" as proper subject matter for a design patent.[198]

Therefore, it is "essential . . . to know what is properly included in the term 'article of manufacture.'"[199] The next Section analyzes the judicial and administrative decisions that help shed light on this key question.

*2. Patent Office Decisions*

In 1869, the Patent Office began publishing the decisions of the Commissioner of Patents.[200] While these decisions were not binding on courts,[201] they still provide a valuable window into Patent Office practice and policy, as well as the then–current understanding of the phrase "article of manufacture."

It also appears that the commencement of publication of these decisions coincided with an uptick of interest in design patents. In his 1869 decision in *Ex parte Bartholemew*, Commissioner Fisher stated that:

> Letters patent for designs have increased in importance within the last few years. Formerly, but few were granted; now, many are issued. To this day they have made so little figure in litigation that but three reported cases are known, in which design patents have come into controversy. With their increase, questions have arisen concerning their scope and character, which have given rise to dispute and to inquiry as to the correctness of the current practice of the office in this branch of invention.[202]

Commissioner Fisher added that, at least with respect to certain issues of design patent claiming, "the practice of the office ha[d] not been uniform, and that the true practice [was] still to be adopted and followed."[203]

198. SYMONS, *supra* note 47, at 28.

199. WILLIAM D. SHOEMAKER, PATENTS FOR DESIGNS 150 (1929).

200. Jason J. Du Mont, *A Non-Obvious Design: Reexamining the Origins of the Design Patent Standard*, 45 GONZ. L. REV. 531, 538 n.34 (2010) ("The Patent Office began publishing the Commissioner's decisions in 1869." (citing William I. Wyman, *Samuel Sparks Fisher*, 2 J. PAT. OFF. SOC'Y 490, 497–98 (1920))).

201. On other issues of design patent law, the decisions vacillated—sometimes wildly—from Commissioner to Commissioner. *See* Gerard N. Magliocca, *Ornamental Design and Incremental Innovation*, 86 MARQ. L. REV. 845, 874–80 (2003) (recounting the vacillations from Commissioner to Commissioner on the issue of whether patentable designs had to have aesthetic content or merely be "useful"). However, the decisions in this area seem to be much more stable, or at least reconcilable.

202. *Ex parte* Bartholemew, 1869 Dec. Comm'r Pat. 103, 103.

203. *Id*. at 105.

This Section discusses a number of Patent Office decisions that help shed light on the meaning of the phrase "article of manufacture" in 1887, including some decisions issued shortly after that date that help explain and expand upon the earlier decisions.

a) *Ex parte* Brower (1873)

Brower claimed a "design for a glass inkstand and stopper of glass, made square, with equally chamfered edges."[204] The examiner objected to the claim because "the bottle and the stopper are separate articles, and exhibit separate and independent designs."[205] On petition to the Commissioner of Patents, Brower apparently did not dispute the inkstand and stopper were separate "articles of manufacture."[206] Instead, he argued he had created a single "design,"[207] presumably because the pieces were designed to be sold together as a single product.

Acting Commissioner Thacher did not agree.[208] According to Thacher, the main problem was that the appearance of the set as a whole could—and was likely to—be varied. He stated that "a design . . . as a general rule" is "a thing essentially unitary and unvarying in character" and that a patentable design "cannot embrace in its scope alternates or equivalents in form."[209] Therefore, "the relative positions of the two parts, when connected, ought to be uniform and fixed" to qualify as statutory subject matter.[210] So while Brower could have patented his designs for the inkstand and the stopper separately,[211] he could not patent them together in the same application because they did not constitute "a single unitary design for an article of manufacture."[212]

204. *Ex parte* Brower, 1873 Dec. Comm'r Pat. 151, 151.
205. *Id.*
206. *See id.*
207. *Id.*
208. *Id.* at 152.
209. *Id.*
210. *Id.*
211. *See id.*
212. *Id.* A few years later, Commissioner Spear refused to follow *Brower* in a case about casket–screws. *See Ex parte* Rogers, 1878 Dec. Comm'r Pat. 62, 63. Spear did not offer any critique of the legal reasoning in *Brower*; instead, he just said he thought "that it would be [an] unnecessary hardship to require the applicant to make two separate applications . . . ." *Id.* It appears that Spear considered—and that *Rogers* is best viewed as—a case about when multiple claims could be allowed in the same application. *See id.* The "article of manufacture" issue was not discussed in *Rogers*; instead, it was decided on the basis of what constitutes a single "design." *See id.* at 62–63.

b) *Ex parte* Patitz (1883)

Patitz designed a mirror frame and a sconce that could be attached to and detached from each other.[213] According to Patitz, the combination constituted a single "design" for a product that could "be varied and changed to suit the taste by a disassociation of the particular mirror–frame from the sconce, and *vice versa*."[214]

The examiner rejected the claim and Commissioner Butterworth affirmed, relying on *Ex parte Brower*.[215] Butterworth explained the mirror frame and sconce were "two distinct articles of manufacture" with "uses as separate and distinct as those pertaining to a watch and the chain to which it is to be attached."[216] He suggested the designs for both articles could have been claimed in a single application if there had been some "necessary connection between the design for the mirror-frame and the sconce" such that "their union in the manner contemplated in this application" would "constitute a unity of design."[217] But the mere fact the designs were made to be used—and even connected—to each other was not enough.[218] Therefore, the designs for the two separate articles could not be claimed in a single design patent.[219]

c) *Ex parte* Lewis (1891)

Lewis sought a design patent "for the exterior of a country house."[220] When "asked to affix [his] signature to [the] patent," Commissioner Mitchell refused, apparently sua sponte.[221] According to Mitchell, the claimed design was not proper statutory subject matter unless it could be classified as a "manufacture" under Section 4929 of the Revised Statutes.[222] Mitchell noted the word "manufacture" in the design patent subject matter provision had to be construed to mean the same thing as it did in the utility patent subject matter provision.[223] In the latter provision, a "manufacture"

213. *Ex parte* Patitz, 1883 Dec. Comm'r Pat. 101, 102.
214. *Id.*
215. *Id.*
216. *Id.* at 101.
217. *See id.* at 102.
218. *See id*.
219. *Id*.
220. *Ex parte* Lewis, 1891 Dec. Comm'r Pat. 61, 62.
221. *See id.* at 62–63.
222. *Id.* at 62.
223. *See id.* at 63.

was only one of the separately–listed, distinct categories of invention.[224]

Mitchell stated that, despite the long use of the term "manufacture" in U.S. patent law, "no case can be found in which it has ever been construed to include any article not classifiable as personal property."[225] Even though English courts interpreted the word "manufacture" more broadly, "no latitude of judicial construction under any statute, foreign or domestic, has extended it to include realty."[226] Mitchell concluded "the word 'manufacture' must be limited to manufactured articles—that is to say, articles made by hand, machinery, or art, from raw or prepared materials."[227] Read in a vacuum, this definition might appear to include houses. But according to Mitchell, it did not "include a dwelling-house or any other article of realty."[228]

Mitchell also distinguished designs for houses from designs for "articles, such as mantels," which "are manufactured and sold with reference to ultimately becoming part of a house."[229] He stated that such articles were "manufactures" and suggested that designs for such articles could be patented.[230]

d) *Ex parte* Haggard (1897)

Haggard submitted a design patent application with two claims, one for "a cradle-supporting frame" and a "cradle body."[231] The illustration showed the two pieces "movably connected together, the cradle-body swinging in

224. *See id*. at 62 ("The statute of 1793 provides for the granting of a patent to any one who has invented any 'new or useful art, machine, manufacture, or composition of matter.'") (emphasis omitted); *see also id*. at 63 (contrasting this with the broad English interpretation of "manufactures").

225. *Id*. at 62–63.

226. *Id*. at 63.

227. *Id.* In context, it is clear that Mitchell saw the statutory classes of invention listed in Rev. Stat. § 4886 as distinct and separate categories. *See id*. at 62. Therefore, Mitchell's definition should not be read to include or overlap with other statutory categories like "machines."

228. *Id*. The Patent Office's position on this issue was later reversed. *See In re* Hadden, 20 F.2d 275, 275 (D.C. Cir. 1927) (reversing "a Patent Office decision refusing to allow applicant's claim covering a design for a grandstand, on the ground that, although it may be a manufacture, it is not an article of manufacture") (emphasis omitted); *Ex parte* Foshay, 7 U.S.P.Q. (BNA) 121 (Pat. Off. Bd. App. 1930) (holding that "the ornamental design for a building" qualified as proper statutory subject matter). Thus, architectural structures are now considered "articles of manufacture."

229. *Ex parte* Lewis, 1891 Dec. Comm'r Pat. 61, 63.

230. *Id*.

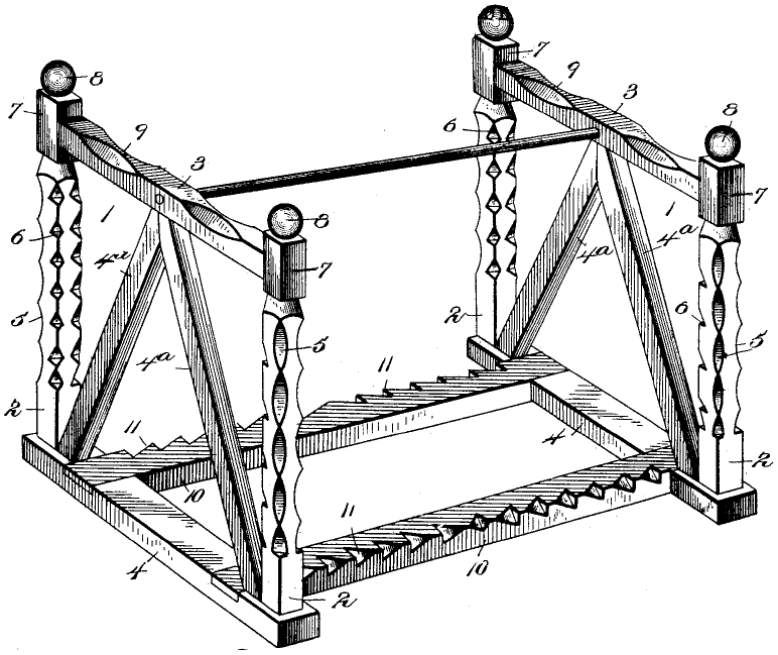
231. *Ex parte* Haggard, 1897 Dec. Comm'r Pat. 47, 48.

the frame."[232] The examiner issued a restriction requirement on the basis that the application claimed two separate designs.[233]

Acting Commissioner Greeley agreed, describing the pieces as "two distinct articles of manufacture."[234] According to Greeley:

> While claims for a design and for a distinctive segregable portion of the design have been permitted to be made in one application, I am not aware that two separate designs have ever been permitted in one application. The requirement of the Examiner is clearly right under the practice as laid down in *ex parte Patitz*, which followed *ex parte Brower*.[235]

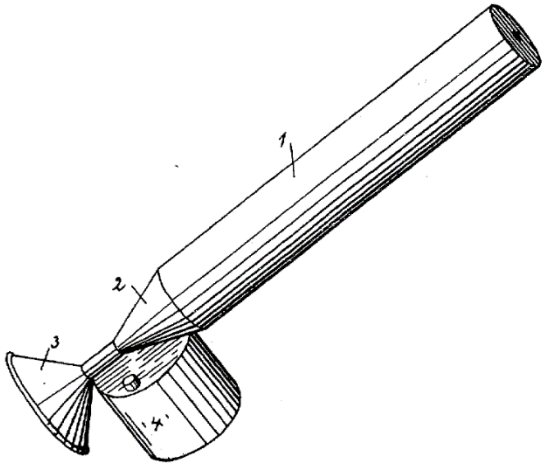
Following this decision, Haggard amended his application to claim only the frame and received a design patent for the design shown below[236]:



232. *Id.*
233. *See id.*
234. *Id.*
235. *Id.* (internal citations omitted) (citing *Ex parte* Patitz, 1883 Dec. Comm'r Pat. 101; *Ex parte* Brower, 1873 Dec. Comm'r Pat. 151).
236. *See id.* (discussing Application No. 621,243); Cradle-Frame, U.S. Patent No. D27,726 fig.1 (issued Oct. 12, 1897 to Ries W. Haggard from Application No. 621,243).

e) *Ex parte* Smith (1897)

Smith claimed a design patent for an atomizer.[237] The atomizer was made up of various parts, including a syringe and a handle that was attached to the body of the atomizer with a rod.[238] The body apparently looked like this[239]:




According to the specification, the rod "may be more or less withdrawn or forced into the body of the atomizer, and to this extent will vary the appearance of the instrument."[240] The examiner rejected the claim "upon the ground that a machine does not fall within the province of the design act."[241]

On petition to Acting Commissioner Greeley, Smith framed the issue as whether the handle and rod "shown in the drawings of this application can or cannot be shown in a design patent in connection with the remainder" of

237. *Ex parte* Smith, 1897 Dec. Comm'r Pat. 170, 171 ("The claim is: 'The design of atomizer herein shown and described.'").

238. *See id.* ("It is also evident that the real merit of the design, if any, consists in the shape of the syringe, provided with a flaring mouthpiece."); *id*. ("The specification closes with the statement: 'The instrument is also provided with a handle 5 on the end of the rod 6, which may be more or less withdrawn or forced into the body of the atomizer, and to this extent will vary the appearance of the instrument.'").

239. *See id*. at 170 (discussing Application No. 620,471); Sprayer Body, U.S. Patent No. D30,293 (issued Feb. 28, 1899 from Application No. 620,471) ("What I claim is—The design for an atomizer-body as herein shown and described.").

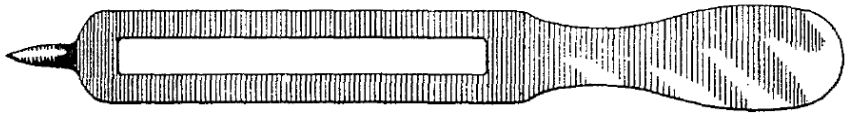
240. *Ex parte* Smith, 1897 Dec. Comm'r Pat. 170, 171.

241. *Id.* at 170 (quoting the examiner's statement).

the instrument.[242] Greeley denied the petition. According to Greeley, "the elements of any design should be of an unchanging character, since any change in these changes the shape or configuration of the whole, and thereby changes the identity of the design as such," therefore, "the movable handle in this case should not be made an element of the design."[243] Greely also indicated that a design for a machine was not proper statutory subject matter.[244] Following this decision, Smith amended his application to claim only the "atomizer-body" and the Patent Office granted the patent.[245]

f) *Ex parte* Tallman (1897)

Tallman submitted an application for a design patent for a "can-opener."[246] The illustrated device included "a 'blade-holder," which could be moved along an opening in the body."[247] Apparently, the body portion looked like this[248]:



242. *See id.*

243. *Id.* at 171.

244. *See id.* at 170 ("The *grounds of rejection were two*—namely, anticipation and that the subject-matter of the application is not proper subject-matter for a design patent, being for an apparatus. . . . It is clear that *both of these are proper grounds for rejection* and for appeal to the Examiners-in-Chief . . . .") (emphasis added). The question of whether the atomizer was, in fact, a machine was not before Greeley. At the time, only questions of form (i.e., "one that relates to the fitness of the application for an examination on its merits, or involves merely some rule of Office practice") were directly appealable to the Commissioner of Patents; questions on the merits had to first be appealed to the Examiners–in–Chief. *See* 2 WILLIAM C. ROBINSON, THE LAW OF PATENTS FOR USEFUL INVENTIONS at § 566, 183 (1890). Thus, to the extent there was a dispute over whether this device actually was an "apparatus" (i.e., "machine"), that was a matter for Examiners–in–Chief. *See id*.

245. *See* U.S. Patent No. D30,293 (issued Feb. 28, 1899 from Application No. 620,471) ("What I claim is—The design for an atomizer-body as herein shown and described."); *see also Ex parte* Smith, 1897 Dec. Comm'r Pat. 170, 170 (relating to Application No. 620,471).

246. *Ex parte* Tallman, 1898 Dec. Comm'r Pat. 10, 10.

247. *See id*.

248. *See id*. (discussing Application No. 634,949); U.S. Patent No. D28,232 fig.1 (issued Feb. 1, 1898 from Application No. 634,949).

The application contained "two claims, one for a design for the body and the other for a design for the cutter."[249] The examiner rejected the application on the basis that the claimed design was "not for an article of manufacture, but for an apparatus," i.e., for a machine.[250] The examiner also argued that even if the two pieces could be considered as a single article of manufacture, "the applicant does not claim the entirety, and that without this no design patent can issue."[251]

Acting Commissioner Greeley agreed that the claim was not allowable because "the design law was never intended to apply to structures having movable parts."[252] Greeley stated that if Tallman's "intention were to make the device all in one piece, as by casting, a claim for the structural design might be proper; but it is obvious that at present as the knife is shifted the form or contour of the article will be changed."[253] Greeley did not address the question of whether a can–opener was a machine.[254] Following this decision, Tallman amended his claim to cover only the "can-opener body" and the Patent Office issued the patent.[255]

g) *Ex parte* Brand (1897)

Brand sought a design patent "for the parts of a joint for bedstead-rails."[256] The application showed "a casting on the side rail of a bedstead and another adapted to be attached to the frame of the bedstead, which castings are adapted to interlock and form a joint."[257] The examiner issued a restriction requirement and Assistant Commissioner Greeley affirmed.[258] According to Greeley, the application "cover[ed] two separate and distinct articles" and "[t]he fact that two articles are used together does not make them, when so used, constitute a unitary design."[259] Greeley concluded that a protectable design must be for "a single unchangeable article of

249. *Ex parte* Tallman, 1898 Dec. Comm'r Pat. 10, 10.
250. *See id.* at 11.
251. *Id.*
252. *Id.* (citing *Ex parte* Smith, 1897 Dec. Comm'r Pat. 170).
253. *Id.*
254. *See id.*
255. *See id.* at 10 (discussing Application No. 634,949); U.S. Patent No. D28,232 (issued Feb. 1, 1898 from Application No. 634,949).
256. *Ex parte* Brand, 1898 Dec. Comm'r Pat. 62, 63.
257. *Id.*
258. *Id.*
259. *Id.* (citing *Ex parte* Patitz, 1883 Dec. Comm'r Pat. 101; *Ex parte* Haggard, 1897 Dec. Comm'r Pat. 47).

manufacture and must not be made up of independent detachable parts."[260] In Brand's case, the two casings were "designed for the very purpose of attachment and detachment from each other" and, accordingly, did not "constitute a unitary design."[261]

h) *Ex parte* Adams (1898)

Walter S. Adams claimed a design for a "Truck Side Frame."[262] The examiner refused to consider the application because:

> A machine does not fall within the purview of section 4929, Revised Statutes. On the contrary, the only subject of the design act is the "manufacture" named in section 4886, Revised Statutes.[263]

In support of his position, the examiner cited *Ex parte Lewis*.[264] Assistant Commissioner Greely ruled that he did not have jurisdiction to consider the propriety of the examiner's action.[265] Nonetheless, Greeley stated that the claim should fail for an independent reason:

> [T]he design law was never intended to apply to structures having movable parts. If the parts are movable, the structure presents a great variety of forms instead of being *limited to a single shape or configuration of* an article of manufacture, as provided in section 4929 of the Revised Statutes.[266]

According to Greeley, the problem was that the applicant was not trying to patent a single "design."[267]

Greeley noted, however, that while a design for a "machine itself" could not be patented, "[t]he several articles of manufacture of peculiar shape which when combined produce a machine or structure having movable parts" could be patented.[268]

---

260. *See id.*
261. *Id.*
262. *Ex parte* Adams, 1898 Dec. Comm'r Pat. 115, 115.
263. *See id.* at 116 (quoting the examiner's letter).
264. *See id.* at 116 (citing *Ex parte* Lewis, 1891 Dec. Comm'r Pat. 61).
265. *Ex parte* Adams, 1898 Dec. Comm'r Pat. 115, 116. Instead, it should have been appealed to the Examiners–in–Chief. *Id.*; *see also supra* note 244 (discussing the Commissioner's jurisdiction over appeals).
266. *Ex parte* Adams, 1898 Dec. Comm'r Pat. 115, 116 (emphasis added).
267. *See id.*
268. *Id.*

i) *Ex parte* Amberg (1898)

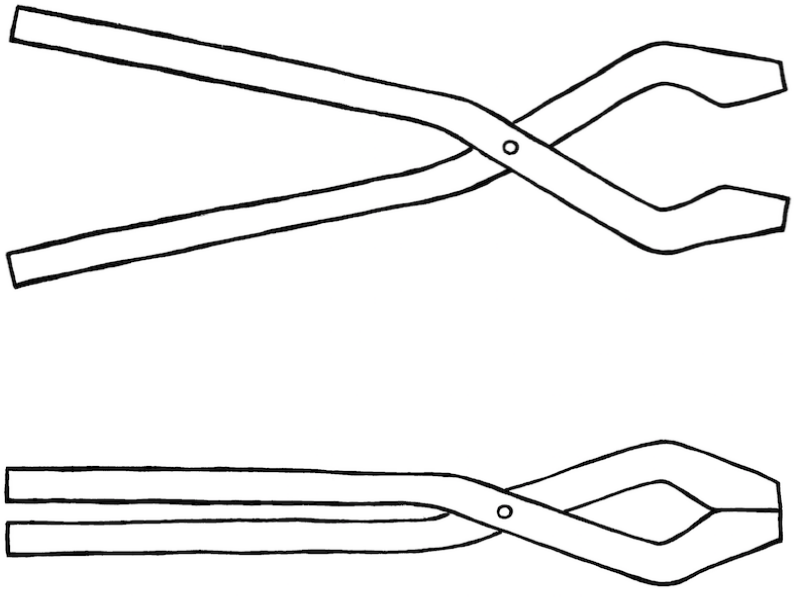
Amberg sought a design patent for a "design for banners, badges, buttons, and other decorative devices and displays."[269] The examiner required that he change the title because "the description and drawing show[ed] that" Amberg had only produced the design as applied to a "banner or flag."[270] On petition to the Commissioner, Amberg argued he should not have to change the title because his design was for a "surface ornamentation that may be placed on other articles."[271]

Commissioner Duell sustained the examiner's requirement, noting that even if Amberg's design could be applied to other articles, Amberg had not actually done so.[272] Because Amberg had not "invented *and produced* this design on any other article of manufacture," he had to change his title and the claim to cover only "what he has produced and shown and described . . . leaving to the courts the question as to whether he may use it on any other article . . . or whether any other party using it on other devices would infringe his design."[273] Although *Amberg* does not directly address the issue of what constituted an "article of manufacture," it does shed light on how the Patent Office conceptualized the scope of design patents for surface ornamentation. For example, it shows that the Patent Office thought that a design patent for surface ornamentation could be—but would not necessarily be—infringed by using the design on an article that was different than the one produced by the patent owner.

j) *Ex parte* Kapp (1898)

The applicants claimed a design for "a device for removing clothes from washboilers"—i.e., for a pair of tongs.[274] If submitted today, the illustrations might have looked something like this[275]:

269. *Ex parte* Amberg, 1898 Dec. Comm'r Pat. 117, 117.
270. *See id.* 117–18.
271. *Id.* at 118.
272. *Id.*
273. *Id.*
274. *Ex parte* Kapp, 1898 Dec. Comm'r Pat. 108, 108.
275. *See id.* (discussing the design disclosed in Application No. 629,446); Design for a Member of a Pair of Tongs, U.S. Patent No. D29,307 (issued Sept. 6, 1898 from Application No. 629,446); *see also supra* Section II.B (discussing contemporary design patent claiming rules); Burstein, *Costly Designs*, *supra* note 1, at 114 (same).



The examiner required the applicants to amend the application because it showed an "apparatus" instead of an "article of manufacture."[276]

On appeal, Commissioner Duell sustained the requirement on a different basis. Like Assistant Commissioner Greely did in *Adams* and *Tallman*, Duell avoided the issue of whether the design was for a "machine" or a "manufacture" and instead focused on the fact that the configuration changed when the article was in use.[277] Duell noted "the form or contour of which as a whole is changed as the tongs are opened or closed" and stated

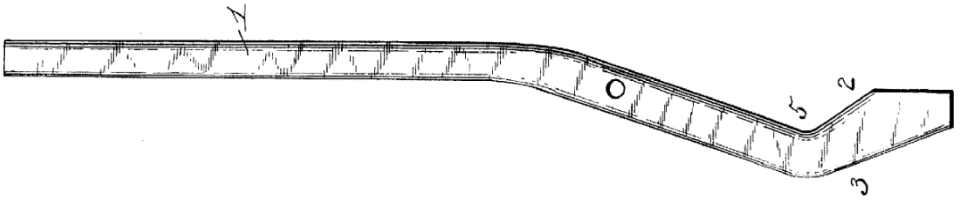
276. *See Ex parte* Kapp, 1898 Dec. Comm'r Pat. 108, 108 ("This is a petition from the action of the Examiner of May 24, 1898, that 'if applicant should revise his application to set up the design as residing in one of the members of the tongs, in order that the claim be for the design for the shape and configuration of an article of manufacture, and not of an organized apparatus, as is now the case, further consideration will be given the application.'").

277. *Compare id.*, *with Ex parte* Adams, 1898 Dec. Comm'r Pat. 115, 116, *and Ex parte* Tallman, 1898 Dec. Comm'r Pat. 10, 11. Arguably, the question of whether the device was really a "machine" was closer in *Kapp* than in *Adams*, which might explain why Duell wanted to resolve the case on different grounds. *See generally supra* Section IV.A.1.a) (discussing the debate over how tools should be classified).

that "[i]t is not the intent of the design law to cover designs of this character."[278] Furthermore, according to Duell:

> If applicants have invented and produced anything that is novel, it is not a pair of tongs, but the shape or configuration of a member or jaw of a pair of tongs. Their description and claim should be limited to this.[279]

Following this decision, the Patent Office approved the application as amended to claim only one piece of the tongs:[280]



k) *Ex parte* Wiessner (1898)

Wiessner sought a design patent for a "metallic bedstead." The drawing showed "a bedstead consisting of the headboard, footboard, and side rails."[281] The headboard and footboard looked "somewhat similar" but were not identical in appearance.[282] The footboard apparently looked like this:[283]

278. *Ex parte* Kapp, 1898 Dec. Comm'r Pat. 108, 108 (internal citations omitted) (citing *Ex parte* Smith, 1897 Dec. Comm'r Pat. 170; *Ex parte* Tallman, 1898 Dec. Comm'r Pat. 10, 10).

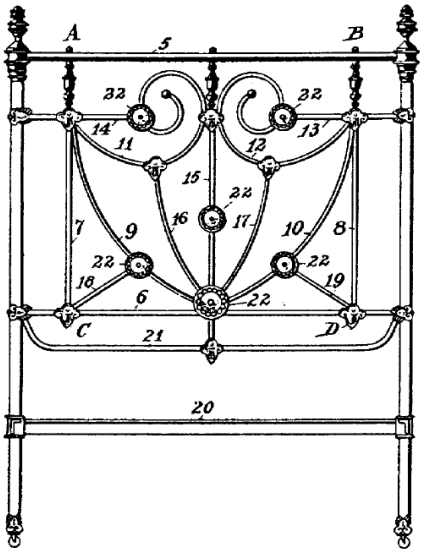
279. *Id.*

280. Design for a Member of a Pair of Tongs, U.S. Patent No. D29,307 (issued Sept. 6, 1898 from Application No. 629,446); *see also Ex parte* Kapp, 1898 Dec. Comm'r Pat. 108, 108 (discussing the design disclosed in Application No. 629,446).

281. *Ex parte* Wiessner, 1898 Dec. Comm'r Pat. 236, 237.

282. *See id.* ("The headboard and footboard contain somewhat similar ornamentation, but differ from each other in certain particulars.").

283. *See id.* (discussing Application No. 683,863); End Piece for Bedsteads, U.S. Patent No. 30,017 (issued Jan. 17, 1899 from Application No. 683,863).




In his application, Wiessner claimed:

> 1. In a design for a metallic bedstead, the design for a headboard, substantially as shown and described.
>
> 2. In a design for a metallic bedstead, the design for a footboard, substantially as shown and described.
>
> 3. The design for a metallic bedstead, substantially as shown and described.[284]

The examiner required a division, noting the headboard and footboard were "separate and distinct articles of manufacture," even though they were "parts or elements of the entire bedstead."[285] On petition, Assistant Commissioner Greeley had to decide whether "the applicant may . . . have claims to two separate parts of that bedstead" in the same application as a

284. *Ex parte* Wiessner, 1898 Dec. Comm'r Pat. 236, 237.
285. *See id.* at 238.

claim for the entire bedstead.[286] Greeley ruled that the applicant could not.[287]

According to Greeley, if a larger article contained "segregable parts" that were "separate articles of manufacture, complete within themselves," designs for those constituent articles could be patented separately from a design for the larger article; however, those claims covered separate designs and had to be made in separate applications.[288] He stated that "[t]he fact that these articles may be united and form still another article of manufacture furnishes no reason for allowing them in one case."[289] He reasoned that designs for these "segregable parts" were "beyond question separate and independent designs and neither would infringe a patent on the other, and therefore to allow them in one case [i.e., in one application] would be to grant a single patent on a great number of different articles of manufacture."[290]

Following this decision, Wiessner amended his application to claim only the "end piece" of the bedstead and the Patent Office allowed the claim.[291]

l) *Ex parte* Steck (1901)

Steck claimed a design for "an improvement in frames of water-towers," specifically the type "used by fire departments to support the hose when playing upon a fire in a tall building."[292] The examiner rejected Steck's design patent claim "on the ground that the application [was] not limited to a single definite article of manufacture."[293]

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286. *Id.* The examiner also raised other concerns about Claims 1 and 3; however, those issues were not properly before the Commissioner. *Id*. ("Claim 3 covers the entire bedstead; whether properly so or not cannot now be considered . . . ."); *id*. at 242 ("The Examiner has rejected claim 1 as not being limited to a single article of manufacture; but that question has not been considered on this petition, since it is a matter for the Examiners-in-Chief on appeal."); *see also supra* note 244 (discussing the Commissioner's jurisdiction to hear appeals). Wiessner eventually received a design patent for the end–piece (Claim 2). *See infra* note 291 and accompanying text. But it does not appear that he ever received a design patent for either the headboard or the whole.

287. *Ex parte* Wiessner, 1898 Dec. Comm'r Pat. 236, 242.

288. *See id.*

289. *Id.*

290. *Id.*

291. *See id.* at 237 (discussing Application No. 683,863); End Piece for Bedsteads, U.S. Patent No. 30,017 (issued Jan. 17, 1899 from Application No. 683,863).

292. *Ex parte* Steck, 1902 Dec. Comm'r Pat. 9, 15.

293. *Id.* at 10.

Commissioner Allen agreed the claim should not be allowed, but on a different basis—namely, that the application claimed a design for "a machine and not an article of manufacture."[294] Allen noted, "[u]nder the express provisions of the statute [design] patents are limited to 'an article of manufacture,' and there is clear and well-defined distinction in patent law between a machine and an article of manufacture."[295]

Allen suggested Congress may have decided to exclude designs for machines from design patent protection because "[t]he subject-matter of patents must be definite and certain" and a design for the configuration of "a machine made up of movable parts" would be constantly changing.[296] But, according to Allen:

> It has never . . . been the practice of the [Patent] Office to require absolute immovability of the parts of an article in order to warrant the holding that it is an article of manufacture and patentable as a design. There may be some relative movement of the parts of a single article of manufacture without changing the appearance of the article, and in such case it comes within the design law; *but nothing which amounts to a machine can come within the law*.[297]

Allen then framed the issues in a two–part test that seems to reconcile many of the previous Commissioner decisions:

> [F]irst, is its shape fixed and definite? and, second, is it an article of manufacture and not a machine? . . . If it is a machine, it is not patentable under the law, whether or not the movement of the parts is such as to materially change the appearance of the machine as a whole.[298]

Thus, under the *Steck* framework, if a design was not "fixed and definite" due to moving parts, there would be no need to ask whether the design was for a "machine."

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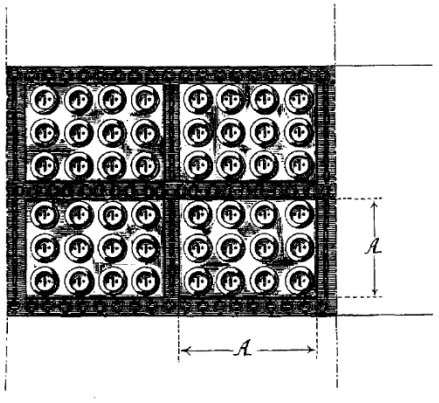
294. *Id.* at 15.
295. *Id.* at 13 (citing to Rev. Stat. § 4929).
296. *Id.*
297. *Id.* (emphasis added).
298. *Id.* This framing helps explain—or at least reconcile—decisions in which previous Commissioners seemed to duck the "machine" issue. *See, e.g.*, *Ex parte* Kapp, 1898 Dec. Comm'r Pat. 108; *Ex parte* Adams, 1898 Dec. Comm'r Pat. 115.

*3. Court Decisions*

By 1887, there were not many court cases involving design patents generally[299] and even fewer that addressed the "article of manufacture" issue. This Section discusses the three judicial decisions that help shed light on what "article of manufacture" meant in 1887.

a) *Pratt v. Rosenfeld* (1880)

In *Pratt*, the asserted patent claimed "a design for a card of buttons, divided into spaces, covered with foil, by narrow bands, with a dozen of pearl buttons in rows, as shown below[300]:




The trial court dismissed the complaint because the patent did not claim a design "for a manufacture."[301] The court saw the buttons as the relevant "manufactures" because "the buttons are to be used by the purchaser, but the card is not, either with them or by itself."[302] The applicant had not, however, invented a new design *for* the buttons; instead, the applicant had

299. According to Commissioner Fisher, by 1869 there had only been three litigated design patent cases. *See, e.g.*, *Ex parte* Bartholemew, 1869 Dec. Comm'r Pat. 103, 103 ("[Design patents] have made so little figure in litigation that but three reported cases are known"). Fenton's 1889 treatise on design patents, which purported to contain "all reported cases" included ninety–four reported judicial decisions. *See* FENTON, *supra* note 186, at iii, vii–xii.

300. Pratt v. Rosenfeld, 3 F. 335, 335 (C.C.S.D.N.Y. 1880) ("This suit is brought upon design patent No. 7,914 . . . ."); *see also* U.S. Patent No. D7,914 (issued Dec. 8, 1874).

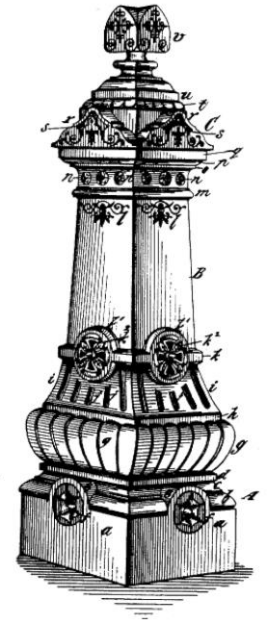
301. *See Pratt*, 3 F. at 335–36 ("The statute (Rev. Stat. Sec. 4929) authorizes the grant of a patent to any person who, by his own industry, genius, efforts, and expense, has invented and produced any new and original design for a manufacture . . . . The subject of this patent is not covered by this statute unless it is included in the term 'manufacture.'").

302. *See id.* at 337.

merely created a new "method of putting [those buttons] up for sale."[303] The court reasoned, "merely changing the mode of keeping and presenting an article for sale, without changing its form or appearance, will not support a patent for a design."[304] Instead, the applicant had to do "something affecting the article itself."[305] *Pratt* also suggests that an "article of manufacture" had to be something actually "used by the purchaser," as opposed to packaging or a way of displaying items for sale.[306]

b) *Simpson v. Davis* (1882)

In *Simpson*, the plaintiff had a patent for the design a newel post.[307] The illustration from that patent is shown below[308]:



303. *See id.* at 336; *see also id*. (noting that the buttons were "not changed at all, either in form or appearance, by the patented invention").

304. *Id.* at 337.

305. *Id*.

306. *See id*. Importantly, the court in *Pratt* did not have to decide—and therefore, did not hold—that an "article of manufacture" was always whatever was "used by the purchaser." Instead, it merely concluded that if something was not "used by the purchaser," it was not (or not a part of) an "article of manufacture."

307. Simpson v. Davis, 12 F. 144, 144 (C.C.E.D.N.Y. 1882).

308. U.S. Patent No. D12,026 (issued Nov. 9, 1880); *see also Simpson*, 12 F. at 144 (identifying this as the patent–in–suit).

The patent–in–suit contained multiple claims.[309] The defendant argued the sixth claim—which claimed a design for the cap of a newel post—was invalid because the cap of a newel post was not a "manufacture."[310]

There was evidence in the record indicating "the cap of a newel post is a distinct article often manufactured by itself, but never used except in connection with other parts . . . to make up what is known as a newel post."[311] Based on that evidence, the court thought the cap "may be held to be a manufacture."[312] But the court concluded the validity of the sixth claim was "of no importance" to the ultimate resolution of the case because the seventh claim—which claimed the entire newel post—was infringed and not invalid.[313] Therefore, the discussion of the sixth claim in *Simpson* is *dicta*. But it suggests that an "article of manufacture" was something that is "manufactured by itself," even if it was "never used except in connection with other parts . . . to make up" a larger product.[314]

c) *Westinghouse Elec. & Mfg. Co. v. Triumph Elec. Co.* (1899)

The patent–in–suit claimed a design for "a frame for electric machines," as shown below[315]:

309. *Simpson*, 12 F. at 144 ("There are 11 claims. Only the fifth, the sixth, and the eleventh are relied on here.").

310. *See id.* at 145 ("The first question presented by this claim is whether the cap of a newel post is a manufacture within the meaning of the statute.").

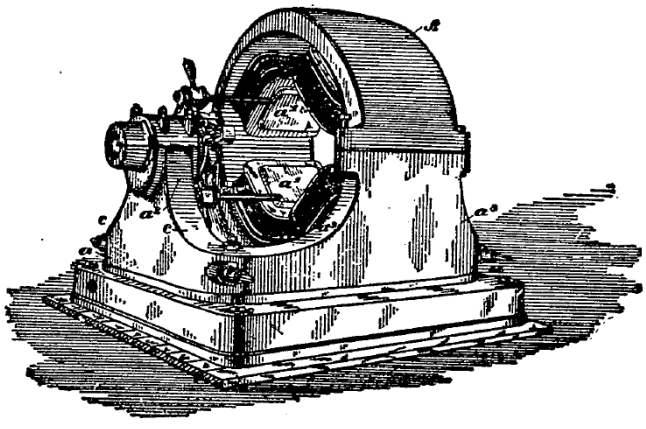
311. *Id.* at 145–46.

312. *Id.* at 146.

313. *Id.*

314. *See id.*

315. Westinghouse Elec. & Mfg. Co. v. Triumph Elec. Co., 97 F. 99, 99–100 (6th Cir. 1899); Design for a Frame for Electric Machines, U.S. Patent No. D21,416 (issued Mar. 22, 1892).



The defendant argued the design patent was invalid because, inter alia, it did not claim a design for an "article of manufacture."[316] Specifically, the defendant argued that "the frame of the electric machine is not an article of manufacture" and "a design patent cannot be granted for the configuration of what is part of a machine, rather than an article of manufacture."[317] The Sixth Circuit characterized this issue as one "not free from difficulty" but decided that it was not necessary to resolve it because the design was invalid on another basis—namely, because the design "was not new or original."[318]

Although the court did not answer the "article of manufacture" question, the fact that the court found the question difficult suggests at least some disagreement with the Patent Office's conclusion that a part of a machine could qualify as an "article of manufacture."[319]

### B. REMEDY

On February 4, 1887, Congress enacted the additional design patent remedy provision. This Section reviews the Supreme Court case that prompted Congress to act and explains the aspects of the legislative history relevant to the question of what the phrase "article of manufacture" meant in 1887.

316. *Westinghouse*, 97 F. at 101.
317. *Id.* at 102.
318. *Id*. at 102–03.
319. *Compare id., with, e.g.*, *Ex parte* Smith, 1897 Dec. Comm'r Pat. 170. Notably, however, nothing in *Westinghouse* indicates any disagreement with the notion that there was a fundamental distinction between the statutory categories of "machines" and "articles of manufacture." Instead, it merely expresses at least some mild skepticism that machine components could be the subject of design patents at all.

*1. The Carpet Cases*

In *Dobson v. Hartford Carpet Co.*, the Supreme Court was called on to decide three consolidated cases for design patent infringement.[320] The defendants accused John and James Dobson of infringing three design patents.[321] Each of those patents claimed a design for surface ornamentation for a piece of carpet.[322] The lower court found the defendants liable for infringing all three design patents.[323] The plaintiffs "waived all claim for profits" and sought actual damages based on lost sales.[324] Both the plaintiffs and the defendants sold their carpets by the yard.[325] The lower court calculated the plaintiffs' actual damages by multiplying the number of yards of infringing carpet the defendants sold by the profits the plaintiffs made per yard on their own commercial embodiments,[326] for a total of $2,799.50 in damages.[327] The defendants appealed these awards to the Supreme Court.[328]

The Supreme Court reversed.[329] The Court held that the rule it established for the recovery of profits or damages in utility patent cases also applied in design patent cases.[330] That rule, as stated in *Garretson* v. *Clark*, was:

320. Dobson v. Hartford Carpet Co., 114 U.S. 439, 440 (1885).

321. *Id.* The Dobsons "trad[ed] as John and James Dobson and as 'The Falls of Schuylkill Carpet Mills.'" *Id.*

322. *Id.* The design patents in suit were: U.S. Patent No. D11,074 (issued Mar. 18, 1879); U.S. Patent No. D10,778 (issued Aug. 13, 1878); and U.S. Patent No. D10,870 (issued Oct. 15, 1878). *See id*. Thus, *Dobson* is sometimes referred to as "the Carpet Cases." *See, e.g.*, Untermeyer v. Freund, 50 F. 77, 78 (C.C.S.D.N.Y. 1892), *aff'd*, 58 F. 205 (2d Cir. 1893).

323. *Dobson*, 114 U.S. at 441.

324. *See id.* at 441–43.

325. *See id.*

326. *See id.*

327. *See* Bigelow Carpet Co. v. Dobson, 10 F. 385, 387–88 (C.C.E.D. Pa. 1882) (awarding $737 for infringement the first design patent, $750 for the second, and $1,312.50 for the third). $2,799.50 in 1882 would be worth almost $70,000 in 2016. *See Consumer Price Index (Estimate) 1800-*, FED. RES. BANK OF MINNEAPOLIS https://www.minneapolisfed.org/community/teaching-aids/cpi-calculator-information/consumer-price-index-1800 (last visited Aug. 20, 2017) [hereinafter *CPI Calculator*] (2799.50 x (719.7/29) = 69,475.8672).

328. *Dobson*, 114 U.S. at 442. At the time, patent cases were directly appealable to the Supreme Court. *See* John F. Duffy, *The* Festo *Decision and the Return of the Supreme Court to the Bar of Patents*, 2002 SUP. CT. REV. 273, 286–87 (2002).

329. *Dobson*, 114 U.S. at 446.

330. *Id.* at 444–45.

> The patentee must . . . give evidence tending to separate or apportion the defendant's profits and the patentee's damages between the patented feature and the unpatented features, and such evidence must be reliable and tangible, and not conjectural or speculative; *or* he must show, by equally reliable and satisfactory evidence, that the profits and damages are to be calculated on the whole machine, for the reason that the entire value of the whole machine . . . is properly and legally attributable to the patented feature.[331]

As applied to design patents, this rule allowed for an award of profits or damages in two different scenarios.[332] First, where the patentee could prove that some portion of the profits or damages from the infringing article were attributable to the patented design, the patentee could recover those apportioned profits or damages.[333] Second, in cases where the patentee could prove that "the entire value" of the infringing product was "properly and legally attributable" to the patented design, the patentee could recover the profits or damages for the entire article.[334]

As to the first scenario, the Court made it clear that the requisite "apportionment" would require distinguishing between the profits or damages attributable to design—i.e., the surface ornamentation and/or configuration of the article—and the profits or damages attributable to the "intrinsic merits of quality and structure" of the article itself.[335] As to the

331. *Id.* at 445 (quoting Garretson v. Clark, 111 U.S. 120, 121 (1884)) (internal quotation marks omitted) (emphasis added). Although this passage from *Garretson* refers to patented "features," it is clear from the context that the *Dobson* Court was drawing a distinction between patented *designs* and the underlying articles, not anticipating our current fragment–claiming system, wherein one part of a configuration could be claimed and the rest disclaimed. *Compare id*., *with* Section II.B, *supra*.

332. *See Dobson*, 114 U.S. at 445.

333. *See id*.

334. *See id*. (stating that this type of recovery was applicable in "exceptional cases"); *see also id*. at 445–46 (stating that the entire profit for a decorated article could not be attributed to—and thus awarded for—infringement of the patented surface ornamentation "*unless* it is shown, by evidence, as a fact, that the profit ought to be so attributed" (emphasis added)).

335. *See id*. ("Approval of the particular design or pattern may very well be one motive for purchasing the article containing it, but the article must have *intrinsic merits of quality and structure*, to obtain a purchaser, aside from the pattern or design . . . .") (emphasis added); *see also id*. at 444 (distinguishing between "the profits from carding, spinning, dyeing and weaving" a carpet and the "profits . . . due to the figure or pattern"); *id*. at 445 (distinguishing between "[a] design or pattern in ornamentation or shape" and "[t]he article which embodies it"); *see also* S. REP. NO. 49-206, at 1–2 (1886) (stating that the Court "held . . . that the complainant must clearly prove what part of his own damage or what part of defendant's whole profit on the article made and sold was directly due to the

second scenario, the Court stated a design patent owner would have to prove articles bearing the patented design sold for a higher price than articles not bearing the patented design in order to recover the "entire profit" for sales of an infringing article.[336] Applying this rule to the facts of *Dobson*, the Court stated:

> [N]o rule has been sanctioned which will allow, in the case of a patent for a design for ornamental figures created in the weaving of a carpet, or imprinted on it, the entire profit from the manufacture and sale of the carpet, as profits or damages, including all the profits from carding, spinning, dyeing, and weaving, thus regarding the entire profits as due to the figure or pattern, unless it is shown, by reliable evidence, that the entire profit is due to the figure of pattern.[337]

In *Dobson*, there "was no evidence" in the record as to "the value which the designs contributed to the carpets," and therefore no support for an award of either apportioned profits or entire profits.[338] Accordingly, the Court reversed the lower court's entire–profit awards and remanded the cases with instructions to award nominal damages of six cents in each of the three consolidated cases.[339]

*2. Congress Steps In*

The Supreme Court issued its decision in *Dobson* on April 20, 1885.[340] At that time, the chairs of the U.S. Senate and U.S. House Committees on

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*appearance of those articles as distinguished from their material, their fabric, their utility, &c.*, the design, to wit, the appearance being the only thing patented." (emphasis added)); H.R. REP. NO. 49-1966, at 1–2 (1886) (same); FENTON, *supra* note 186, at 186–87 (stating that the 1887 Act was meant to address the difficulty of apportioning between the design and "the article itself"); Untermeyer v. Freund, 50 F. 77, 79 (C.C.S.D.N.Y. 1892), *aff'd*, 58 F. 205 (2d Cir. 1893) ("*It is the profit on the sale of the article for which the infringer must account, and not alone the profit which can be demonstrated as due to the design.*" (emphasis added)); Nike, Inc. v. Wal-Mart Stores, Inc., 138 F.3d 1437, 1442 (Fed. Cir. 1998) ("The difference for design patents, as enacted in 1887, was the removal of the need to apportion the infringer's profits *between the patented design and the article* bearing the design." (emphasis added)).

336. *Dobson*, 114 U.S. at 444.

337. *Id.*

338. *Id.* at 443.

339. *Id.* at 447. The next year, the Supreme Court reached the same conclusion in a similar case against the Dobsons. *See* Dobson v. Dornan, 118 U.S. 10 (1886).

340. *Dobson*, 114 U.S. at 439.

Patents were both from Connecticut.[341] Textile manufacturing was a major industry in Connecticut.[342] According to one study, in 1880, 29% of Connecticut manufacturing jobs were in the textiles industry,[343] which employed 33,150 people and had a "value output" of over $53 million.[344] The carpet sector alone employed 1,654 people and had an output of over $2.5 million.[345]

After *Dobson* was decided, Senator Orville Hitchcock Platt of Connecticut, who was the chair of the Senate Committee on Patents, introduced a bill that would create a new remedy for certain acts of design patent infringement.[346] On February 15, 1886, Representative Charles Le Moyne Mitchell of Connecticut, who was the chair of the House Committee on Patents, introduced a substantially identical bill in the House.[347] A modified version of the Senate bill was enacted on February 4, 1887.[348] As enacted, the new provision stated:

> That hereafter, during the term of letters patent for a design, it shall be unlawful for any person other than the owner of said letters patent, without the license of such owner, to apply the design secured by such letters patent, or any colorable imitation thereof, to any article of manufacture for the purpose of sale, or to sell or expose for sale any article of manufacture to which such design or colorable imitation shall, without the license of the owner, have been applied, knowing that the same has been so applied. Any person violating the provisions, or either of them, of this section, shall be liable in the amount of two hundred and fifty

341. *See* BIOGRAPHICAL DIRECTORY OF THE UNITED STATES CONGRESS, 1774-1989: BICENTENNIAL EDITION 1512 (1989) [hereinafter BICENTENNIAL DIRECTORY] (entry for Charles Le Moyne Mitchell); *id*. at 1653 (entry for Orville Hitchcock Platt).

342. *See, e.g.*, LEIGH FOUGHT, A HISTORY OF MYSTIC, CONNECTICUT: FROM PEQUOT VILLAGE TO TOURIST TOWN 63 (2007) (stating that, from 1815 to 1914, "[f]or New England, whaling and textiles would be the biggest of businesses").

343. *See* GRACE PIERPONT FULLER, AN INTRODUCTION TO THE HISTORY OF CONNECTICUT AS A MANUFACTURING STATE 55–56 (1915).

344. *Id*. at 56. In 1880, Connecticut had a total population of 622,700. U.S. CENSUS BUREAU, RESIDENT POPULATION AND APPORTIONMENT OF THE U.S. HOUSE OF REPRESENTATIVES: CONNECTICUT, https://www.census.gov/dmd/www/resapport/states/connecticut.pdf.

345. FULLER, *supra* note 343, at 56.

346. *See* S. 1034, 49th Cong. § 1 (1886); *see also* BICENTENNIAL DIRECTORY, *supra* note 341, at 1653.

347. H.R. 5570, 49th Cong. (1886); BICENTENNIAL DIRECTORY, *supra* note 341, at 1512.

348. Act of Feb. 4, 1887, ch. 105, 24 Stat. 387, 387. The differences between the original and modified bill are not relevant to the discussion here.

> dollars; and in case the total profit made by him from the manufacture or sale . . . of the article or articles to which the design, or colorable imitation thereof, has been applied, exceeds the sum of two hundred and fifty dollars, he shall be further liable for the excess of such profit over and above the sum of two hundred and fifty dollars; and the full amount of such liability may be recovered by the owner of the letters patent, to his own use, in any circuit court of the United States having jurisdiction of the parties, either by action at law or upon a bill in equity for an injunction to restrain such infringement.
>
> Sec. 2. That nothing in this act contained shall prevent, lessen, impeach, or avoid any remedy at law or in equity which any owner of letters patent for a design, aggrieved by the infringement of the same, might have had if this act had not been passed; but such owner shall not twice recover the profit made from the infringement.[349]

Unlike the current statute, the 1887 Act explicitly described the potentially recoverable "total profit" as the "total profit made by [the infringer] from the manufacture or sale . . . of the article or articles . . . ."[350] And by "article or articles," Congress was clearly referring to the "article[s] of manufacture" mentioned earlier in the same paragraph.[351]

As for the rationale behind this new "rule of recovery," the legislative history suggests Congress was concerned that most design patent owners would not be able to recover damages—other than nominal damages—or profits in the wake of *Dobson*.[352] Both the House and Senate reports expressed concern that it would be exceedingly difficult, if not impossible, for most design patentees to do the type of "apportionment" required for an award of partial damages or profits under *Dobson*.[353] Both reports expressed

349. *Id*. at 387–88.

350. *Compare id*., *with* 35 U.S.C. § 289 (2012). Of course, as discussed above, the Federal Circuit has effectively read the "from the manufacture or sale . . . of the article or articles" language back into the statute. *See generally supra* note 103 and accompanying text. No party disputed—and the Supreme Court did not reverse—that portion of the Federal Circuit's decision. *See* Samsung Elecs. Co. v. Apple Inc., 137 S. Ct. 429 (2016).

351. *See* Act of Feb. 4, 1887, ch. 105, § 1, 24 Stat. 387, 387 ("[I]t shall be unlawful for any person other than the owner of said letters patent, without the license of such owner, to apply the design secured by such letters patent, or any colorable imitation thereof, to any *article of manufacture* . . ." (emphasis added)).

352. *See* S. REP. NO. 49-206, at 1 (1886); H.R. REP. NO. 49-1966, at 3 (1886).

353. Both reports stated that "[i]t has been abundantly shown . . . that the proof thus called for can never be furnished." S. REP. NO. 49-206, at 2 (1886); H.R. REP. NO. 49-1966, at 2 (1886). However, neither report stated who made such a showing or what type of evidence had been presented. The Senate report also backed down off the "never" point

doubt that any patentee would be able to recover a defendant's entire profits under the *Dobson* test because "designs do not increase the selling price, but only increase the quantity sold of the articles on which they appear."[354]

The new statute provided for a minimum penalty for $250.[355] That would be about $6,664 in 2016 dollars.[356] According to the Senate report, the $250 minimum penalty was meant to address two different scenarios: (1) where the infringer made no profit; and (2) "where the exact profit in dollars and cents cannot be proved under the technical rules of the law as

later on, stating that the requisite proof would not be available in "the large majority of suits," as opposed to in *all* suits. *See* S. REP. NO. 49-206, at 2 (1886). As noted above, the Court made it clear in *Dobson* the requisite "apportionment" would require distinguishing between the profits or damages attributable to the design and the profits or damages attributable to the other (nonvisual) attributes of the infringing article of manufacture. *See supra* note 335 and accompanying text; *see also* Untermeyer v. Freund, 58 F. 205, 212 (2d Cir. 1893) ("The rule which congress declared for the computation of profits was the total profit from the manufacture or sale of the *article* to which the design was applied, as distinguished from the pre-existing rule of the profit which could be proved to be attributable to the *design*." (emphasis added)).

354. S. REP. NO. 49-206, at 2 (1886); H.R. REP. NO. 49-1966 at 2 (1886). While both reports stated that this fact had been "abundantly proved before your committee," neither report substantiated such claim. *See* S. REP. NO. 49-206, at 2 (1886); H.R. REP. NO. 49-1966 at 2 (1886). Today, by contrast, there is evidence that consumers *will* pay a premium for aesthetic product design. *See* Brief of Amicus Curiae Industrial Designers Society of America in Support of Neither Party at 4–5, Samsung Elecs. Co. v. Apple Inc., 137 S. Ct. 429 (2016) (No. 15-777), 2016 WL 3227035 [hereinafter IDSA Br.] ("Aesthetic contributions by industrial designers are not just the lynchpin for purchases of similarly performing products; *consumers often pay a premium for product beauty*.") (emphasis added).

355. S. REP. NO. 49-206, at 2 (1886). The House and Senate reports both describe the $250 penalty as "the method of the English statute, which prescribes a remedy of £50 on proof of a violation of a design registration, a law that has been in successful operation for upwards of forty years." *Id.* (referring to Patents, Designs, & Trade Marks Act, 1883, 46 & 47 Vict., ch. 57, § 58 (Eng.)); H.R. REP. NO. 49-1966 at 3 (1886) (same). But in reality, the method of the referenced English statute was quite different; it provided for a £50 *maximum* monetary penalty for each violation while the U.S. bill provided for a $250 *minimum* monetary penalty for each violation. *Compare* S. 1813, 49th Cong. § 1 (1886) ("Any person violating the provisions, or either of them, of this section, *shall be liable in the amount of two hundred and fifty dollars* . . . ." (emphasis added)), *with* Patents, Designs, & Trade Marks Act, 1883, 46 & 47 Vict., c. 57, § 58 (Eng.) ("Any person who acts in contravention of this section shall be liable for every offence to forfeit a sum *not exceeding fifty pounds* . . . ." (emphasis added)). And it appears that the English statute was not, in fact, very successful; it was revised in 1888 "to prevent the possibility of ruinous penalties being imposed." *See* DAVID FULTON, A PRACTICAL TREATISE ON PATENTS, TRADE MARKS AND DESIGNS 155 (1894) ("[I]n the Amending Act of 1888 the total amount of penalties to be forfeited in respect of any one design was limited to a maximum of £100").

356. $250 in 1887 would be worth approximately $6,664 in 2016. *See CPI Calculator*, *supra* note 327 (250 x (719.7/27) = 6663.888889).

laid down by the Supreme Court" in *Dobson*.[357] The House report, like the Senate report, states that the $250 penalty was meant to apply in two scenarios.[358] First, the penalty was meant to provide for monetary relief in "the case of an infringement actually committed without profit."[359] Second, according to the House report, it was meant to provide for monetary relief "when the exact profit in dollars and cents cannot be proved under the severe and technical rules of the law (and this would not infrequently occur with defendant the only witness and his books the only evidence)."[360] This suggests that the House committee was particularly concerned about the possibility that defendants might withhold or misrepresent evidence relating to their profits.[361] Notably, both reports seem to contemplate that at least some of the "technical rules of the law" of damages would be left in place.[362]

Importantly, neither the text of the 1887 Act nor its legislative history provide any indication that Congress intended the phrase "article of manufacture" to mean something different in the new remedy provision than it did in the existing subject–matter provision. Nor is there any indication that Congress intended to give that phrase some new meaning or to otherwise depart from its well–established meaning as a term of art.[363] Nor was there any indication that Congress intended to change the scope of any design patents. To the contrary, both the House and Senate reports state

357. S. REP. NO. 49-206, at 2 (1886). Thus, the $250 was not solely meant for situations in which the infringer had made no profits. *See* Corrected Brief of Amici Curiae Jason J. Du Mont and Mark D. Janis in Support of Appellee Apple Inc. at 19, Apple Inc. v. Samsung Elecs. Co., 786 F.3d 983 (Fed. Cir. 2015) (No. 14-1335), 2014 WL 4205378 [hereinafter Janis App. Br.].

358. *Compare* H.R. REP. NO. 49-1966, at 3 (1886), *with* S. REP. NO. 49-206, at 2 (1886). The House report, unlike the Senate report, also mentions deterrence as one purpose of the new provision. H.R. REP. NO. 49-1966, at 3 (1886).

359. *Compare* H.R. REP. NO. 49-1966, at 3 (1886), *with* S. REP. NO. 49-206, at 2 (1886).

360. H.R. REP. NO. 49-1966, at 3 (1886).

361. This was, of course, long before the era of expansive modern discovery practices. *See generally* Richard C. Reuben, *Constitutional Gravity: A Unitary Theory of Alternative Dispute Resolution and Public Civil Justice*, 47 UCLA L. REV. 949 (2000) (noting "the advent of modern discovery in 1938").

362. *See* H.R. REP. NO. 49-1966, at 3 (1886); S. REP. NO. 49-206, at 2 (1886).

363. And of course, "under the normal rules of statutory construction the Court 'assumes that identical words used in different parts of the same act are intended to have the same meaning' . . . ." Roell v. Withrow, 538 U.S. 580, 593 (2003) (quoting Sorenson v. Sec'y of Treasury, 475 U.S. 851, 860 (1986)); *see also* Atl. Cleaners & Dyers v. United States, 286 U.S. 427, 433 (1932) ("Undoubtedly, there is a natural presumption that identical words used in different parts of the same act are intended to have the same meaning." (citing Courtauld v. Legh, L. R., 4 Exch. 126, 130)).

that, aside from adding a new "rule of recovery,"[364] "[t]he bill leaves the present design law just as it is."[365]

## V. LESSONS & IMPLICATIONS

This historical evidence provides a number of important lessons and may have significant implications for current debates about how to interpret and apply 35 U.S.C. § 289. This Section discusses some of those lessons and implications.

### A. IN 1887, "ARTICLE OF MANUFACTURE" WAS A TERM OF ART

This historical evidence demonstrates that by 1887, the term "article of manufacture" was a term of art in U.S. design patent law. It did not refer to any "article" that was "manufactured." Instead, it referred to a tangible item made by humans—other than a machine or composition of matter—that had a unitary structure and was complete in itself for use or for sale.

The very words "article" and "manufacture" indicate that an "article of manufacture" had to be both tangible and made by humans.[366] The Patent Office repeatedly ruled that an article of manufacture had to have a "single, unitary structure."[367] An article of manufacture also had to be complete in

364. S. REP. NO. 49-206, at 1 (1886); H.R. REP. NO. 49-1966, at 3 (1886).

365. *See* S. REP. NO. 49-206, at 2 (1886); H.R. REP. NO. 49-1966, at 4 (1886).

366. *See generally* Samsung Elecs. Co. v. Apple Inc., 137 S. Ct. 429, 434–35 (2016) (using contemporary and nineteenth–century dictionaries to conclude that "[a]n article of manufacture, then, is simply a thing made by hand or machine."). Nineteenth century commentators confirmed that a "manufacture" had to be tangible. *See, e.g.*, WALKER, *supra* note 156, at § 339 (referring to both "machines" and "manufactures" as "classes of tangible things); CURTIS, *supra* note 155, at § 211 (referring to a manufacture as something "tangible"); HOPKINS, *supra* note 163, at § 31, 46 ("[A]s the Supreme Court has pointed out, the process alone remains invisible to the eye, a conception of the mind, known only by its results, while the machine, the manufacture and the composition of matter develop into tangible and visible substance." (citing Cochrane v. Deener, 94 U.S. 780 (1876)). The fact that "manufactures" have historically been understood as being tangible items was also recently recognized by the Federal Circuit in *In re Nuijten*. 500 F.3d 1346, 1357 (Fed. Cir. 2007) (holding that the claimed "signals, standing alone, are not 'manufactures' under the meaning of that term in § 101" because they were not "tangible articles or commodities"). Although the Federal Circuit attempted to distinguish design patent from utility patent subject matter in *Nuijten*, *see id*. at 1357 n.9, that attempt was altogether unpersuasive. *See* Seymour & Torrance, *supra* note 11, at 199 (dissecting the Federal Circuit's footnote).

367. SYMONS, *supra* note 47, at 32 ("The attempt has often been made to secure a patent on a device which is not a single, unitary structure, the Patent Office holding that the term 'article of manufacture' means such a structure and not one or more parts, although they are joined together."); *id*. (discussing *Ex parte* Brower, 1873 Dec. Comm'r Pat. 151; Ex parte Pope, 1883 Dec. Comm'r Pat. 74; *Ex parte* Patitz, 1883 Dec. Comm'r Pat. 101;

itself for use or for sale.[368] To be "complete" in this sense, the item did not have to be the ultimate product sold or used by the ultimate consumer. For example, a mantel was an article of manufacture even though it was meant to "ultimately becom[e] part of a house."[369]

Finally, the category of "articles of manufacture" specifically excluded machines and compositions of matter.[370] These exclusions were based on the *expressio unius est exclusio alterius* canon of construction.[371] In the utility patent subject matter provision, Revised Statutes § 4886, Congress listed "art," "machine," "manufacture," and "composition of matter" as the categories of patentable inventions.[372] In the design patent subject matter provision, Revised Statutes § 4929, Congress did not mention any of these categories other than "manufacture."[373] Accordingly, the Patent Office

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*Ex parte* Gérard, 1888 Dec. Comm'r Pat. 37; Haggard, 1897 Dec. Comm'r Pat. 47; *Ex parte* Brand, 1898 Dec. Comm'r Pat. 62); *see also id.* (referring to Brower as "the earliest reported case found bearing on" the question of what constitutes a "unitary structure").

368. *Ex parte* Blanchard, 1870 Dec. Comm'r Pat. 59, 59; *see also Ex parte* Campbell, 1872 Dec. Comm'r Pat. 228, 228; Wilson v. Rousseau, 30 F. Cas. 162, 211–12 (C.C.N.D.N.Y. 1845).

369. *Ex parte* Lewis, 1891 Dec. Comm'r Pat. 61, 63; *see also Ex parte* Wiessner, 1898 Dec. Comm'r Pat. 236, 238 (noting that the examiner stated—without any apparent dispute from the applicant—that a bed headboard and footboard are "separate and distinct articles of manufacture" from the bedstead itself).

370. *See, e.g.*, *Ex parte* Smith, 1897 Dec. Comm'r Pat. 170, 170; CURTIS, *supra* note 155, at § 27, 20 n.2 (defining "manufacture" to exclude machines); PETTIT, *supra* note 166, at 35–36 ("Manufacture.—This is a very broad term, as broad almost as its derivation implies, *not including, however, machines* or compositions of matter." (emphasis added)); HOWSON & HOWSON, *supra* note 173, at 34 ("It would seem that the word 'manufacture' is used here in the sense of an article of manufacture, a 'thing' made or manufactured by hand or by machine, *and not itself a 'machine'* or a 'composition of matter'" (emphasis added)); *see also supra* Section IV.A.1. The Patent Office ruled that, while an entire machine could never be an "article of manufacture," parts of machines could be. *See, e.g.*, *Ex parte* Smith, 1897 Dec. Comm'r Pat. 170. However, at least one court expressed skepticism that machine parts could ever be articles of manufacture. *See* Westinghouse Elec. & Mfg. Co. v. Triumph Elec. Co., 97 F. 99, 102 (6th Cir. 1899).

371. *See generally* Russello v. United States, 464 U.S. 16, 23 (1983) ("Where Congress includes particular language in one section of a statute but omits it in another section of the same Act, it is generally presumed that Congress acts intentionally and purposely in the disparate inclusion or exclusion." (quoting United States v. Wong Kim Bo, 472 F.2d 720, 722 (5th Cir. 1972))).

372. 1 REVISED STATUTES OF THE UNITED STATES 946 (2d ed. 1878) (reproducing Rev. Stat. § 4886, as then in force). These were all considered to be independent, separate categories of invention. *See, e.g.*, *Ex parte* Blythe, 1885 Dec. Comm'r Pat. 82, 86.

373. REVISED STATUTES OF THE UNITED STATES 962 (1st ed. 1875) (reproducing Rev. Stat. § 4929, as enacted) (referring to a "design for a manufacture" and designs for "any article of manufacture," among other categories, as statutory subject matter). By that point,

repeatedly stated that designs for machines did not constitute proper statutory subject matter.[374] However, the Patent Office allowed design patents for parts of machines if those parts otherwise qualified as articles of manufacture.[375]

The fact that "article of manufacture" was a term of art in 1887 should be considered in evaluating arguments about the "plain meaning" of § 289.[376] After all, "[w]hen a term has become such a term of art, it is the traditional use, not the plain meaning, that governs."[377] And, as discussed above, there is no evidence that Congress meant "article of manufacture" to mean something different in § 289 than it did elsewhere in design and utility patent law.[378]

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"article of manufacture" and "manufacture" were already being used as synonyms. *See supra* note 192.

374. *See, e.g.*, *Ex parte* Tallman, 1898 Dec. Comm'r Pat. 10; *Ex parte* Adams, 1898 Dec. Comm'r Pat. 109; *Ex parte* Smith, 1897 Dec. Comm'r Pat. 170. In 1930, the CCPA rejected this line of cases and concluded that a design for a machine could be the subject of a design patent. *In re* Koehring, 37 F.2d 421, 424 (C.C.P.A. 1930). In *Koehring*, however, the CCPA did not consider the *expressio unius* point, basing its decision mainly on policy grounds and on a rejection of the Patent Office's "moving parts" reasoning. *See id*. at 423–24.

375. *See, e.g.*, *Ex parte* Smith, 1897 Dec. Comm'r Pat. 170, 171; *see also Ex parte* Kapp, 1898 Dec. Comm'r Pat. 108, 108 (affirming the rejection of a claim for a design of a pair of tongs but indicating that a design for an individual tong could be patented). *But see* Westinghouse Elec. & Mfg. Co. v. Triumph Elec. Co., 97 F. 99, 102 (6th Cir. 1899) (expressing skepticism that even a part of a machine could be an "article of manufacture" but not deciding that issue).

376. *See, e.g.*, Brief of Amicus Curiae American Intellectual Property Law Association in Support of Respondent at 7, Samsung Elecs. Co. v. Apple Inc., 137 S. Ct. 429 (2016) (No. 15-777), 2016 WL 4268252 (arguing for a "a Plain-Meaning Statutory Construction"); Janis App. Br., *supra* note 357, at 2 ("Section 289 permits design patentees to claim the infringer's *total* profits on sales of the infringing products. The statutory language is clear.").

377. Mark A. Lemley, *Does "Public Use" Mean the Same Thing It Did Last Year?*, 93 TEX. L. REV. 1119, 1127 (2015) (citing Air Wis. Airlines Corp. v. Hoeper, 134 S. Ct. 852, 861–62 (2014) (emphasis omitted)).

378. *See supra* Section IV.B.2.

### *B.* IN 1887, THE PHRASE "ARTICLE OF MANUFACTURE" DID NOT HAVE THE MEANING ASCRIBED TO IT BY EITHER THE FEDERAL CIRCUIT OR THE SUPREME COURT

In the past two years, both the Federal Circuit and the Supreme Court have interpreted the phrase "article of manufacture" in § 289.[379] While neither expressly purported to be attempting a historical definition of "article of manufacture," it is worth noting that these definitions do not reflect the historical meaning of that phrase.

#### *1. In 1887, "Article of Manufacture" Was Not a Synonym for "Product"*

In *Apple v. Samsung* and *Nordock v. Systems*, the Federal Circuit interpreted the phrase "article of manufacture" in § 289 as a synonym for the infringing product—i.e., as a synonym for whatever the defendant "sold separately . . . to ordinary purchasers."[380] In *Samsung v. Apple*, the Supreme Court suggested any "end product sold to the consumer" would qualify as an article of manufacture.[381] The historical evidence, however, belies both of these interpretations.

In 1887, the phrase "article of manufacture" was not a synonym for "product."[382] A "product" is anything "sold by an enterprise to its customers."[383] Numerous Patent Office decisions illustrate the fact that not all products were considered an "article of manufacture" in 1887.[384] For example, in *Brower*, the inkstand and stopper were deemed to be separate

379. *See* Apple Inc. v. Samsung Elecs. Co., 786 F.3d 983, 1001–02 (Fed. Cir. 2015); Nordock, Inc. v. Sys. Inc., 803 F.3d 1344 (Fed. Cir. 2015); Samsung Elecs. Co. v. Apple Inc., 137 S. Ct. 429, 434 (2016).

380. *See Apple*, 786 F.3d at 1002; *Nordock*, 803 F.3d at 1354–55; *see also supra* Section III.B.1.

381. *Samsung*, 137 S. Ct. at 434 ("The term 'article of manufacture,' as used in § 289, encompasses both a product sold to a consumer and a component of that product.").

382. Even if we ignore history and just look at the contemporary plain meaning of the phrase "article of manufacture," it is clear that this phrase is not a synonym for "product." The universe of things that can be "products" clearly includes items, like produce, that we would not normally consider to be "manufactured" in any reasonable sense of that word. Burstein, *The Patented Design*, *supra* note 1 at 208. Multiple "articles"—again, as that word is commonly understood today—are often sold as a single "product." *Id.*

383. ULRICH & EPPINGER, *supra* note 4, at 2.

384. *See, e.g.*, *Ex parte* Kapp, 1898 Dec. Comm'r Pat. 108, 108 (holding a pair of tongs was not a single "article of manufacture"); *see also Ex parte* Sherman, 1899 Dec. Comm'r Pat. 240, 241 (indicating there was a genuine issue of fact as to whether "inner and outer tubes, forming the fire-walls between the inner and outer flame of a hydrocarbon-burner" were separate "articles of manufacture").

articles of manufacture,[385] even though each one would have been useless without the other[386] and, presumably, would have been sold together as a single product.[387] Similarly, in *Patitz*, the mirror–frame and sconce were separate "articles of manufacture" even though they were designed to be used together and could be attached together to form a single fixture.[388] And in *Haggard*, the "cradle-supporting frame" and a "cradle body" were ruled to be "two distinct articles of manufacture," even though they were designed together and were clearly meant to be sold and used together as a single product.[389]

It is true that, in 1887, an article of manufacture had to be a "product" in the sense it had to be complete enough to be sold to someone.[390] But that "someone" did not have to be the ultimate or end consumer. It could be another manufacturer or artisan.[391]

Additionally, there is no evidence that, in or around 1887, the determination of whether something was an "article of manufacture" was a context–specific inquiry. An item either was an "article of manufacture" or it was not. In particular, there is no evidence the determination of whether something was an "article of manufacture" depended on the actual commercial practices of any of the parties to a particular patent dispute. While an item had to be capable of being sold separately in order to be an article of manufacture, it did not have to actually be sold separately by either

385. *See Ex parte* Brower, 1873 Dec. Comm'r Pat. 151, 151. Granted, Brower did not dispute the examiner's finding that the inkstand and stopper were separate articles of manufacture. *See id.* But one would have expected Brower to raise that issue before the Commissioner if "article of manufacture" had been understood to be a synonym for "product."

386. Specifically, the products would have been useless for their intended purposes. In theory, of course, someone could buy the stopper for use as a paperweight or the inkstand for use as a bud–vase.

387. The products would likely be sold in the normal course of first purchase. Of course, either piece might be separately sold as a replacement part.

388. *See Ex parte* Patitz, 1883 Dec. Comm'r Pat. 101, 102.

389. *See Ex parte* Haggard, 1897 Dec. Comm'r Pat. 47, 48.

390. *See supra* notes 179–181 and accompanying text.

391. *See* SIMONDS, *supra* note 172, at 19. Historically speaking, the Supreme Court was correct to say that "reading 'article of manufacture' in § 289 to cover only an end product sold to a consumer gives too narrow a meaning to the phrase." Samsung Elecs. Co. v. Apple Inc., 137 S. Ct. 429, 436 (2016). At least one later case suggested that being sold separately might not even be required as long as the item was manufactured separately. Pullman Couch Co., Inc. v. Union, 39 U.S.P.Q. 100 (D. Md. 1938) (indicating a furniture post that was "produced separate and distinct from the complete article of furniture" could be a separate "article of manufacture" even though it was "not sold, and can not profitably be sold, as a separate article" in commerce).

the patentee or the accused infringer. For example, in *Simpson v. Davis*, the court suggested that a newel cap could be an "article of manufacture" if it were "manufactured by itself," even if the cap was "never used except in connection with other parts . . . to make up" a complete newel post.[392] Notably, the court's analysis did not depend on whether or not the defendant (or the patent owner) actually manufactured or sold caps separately. Instead, the court focused on whether caps were made—and thus, presumably, could be sold—separately.[393]

Thus, in 1887, an article of manufacture had to be a vendible item.[394] But not all vendible items were articles of manufacture. For example, machines were unquestionably vendible items. Nonetheless, machines were not considered articles of manufacture.[395] Additionally, packaging could, in some sense, be considered a vendible item. However, at least one case indicated an "article of manufacture" must be something actually used by the purchaser beyond the point of sale, not mere packaging.[396]

So, in 1887, an "article of manufacture" was not a synonym for "product" and not every "end product sold to the consumer" qualified as an "article of manufacture."[397] Nor was the "article of manufacture" determination based on what any particular party actually "sold separately . . . to ordinary purchasers."[398] Therefore, in 1887 "article of manufacture" was not a synonym for "product"—let alone for any "end product sold to the consumer" or for "the infringing product."

#### 2. *In 1887, An "Article of Manufacture" Did Not Mean Any "Thing Made by Hand or Machine"*

In *Samsung v. Apple*, the Supreme Court stated that the phrase "article of manufacture" in 35 U.S.C. § 289 "is simply a thing made by hand or

392. *See* Simpson v. Davis, 12 F. 144, 145–46 (C.C.E.D.N.Y. 1882).

393. *See id.*; *see also Ex parte* Campbell, 1872 Dec. Comm'r Pat. 228, 228 (deciding that the applicant's invention was not an "article of manufacture" because it was "not a device or article that he can offer to the public as complete for their use"); Wilson v. Rousseau, 30 F. Cas. 162, 211–12 (C.C.N.D.N.Y. 1845) (suggesting that something that "may be" used separately constitutes a "separate and distinct" manufacture).

394. *See supra* note 176 and accompanying text.

395. *See supra* Section V.A.

396. *See* Pratt v. Rosenfeld, 3 F. 335, 337 (C.C.S.D.N.Y. 1880).

397. *See* Samsung Elecs. Co. v. Apple Inc., 137 S. Ct. 429, 434 (2016). To the extent that the Court was merely saying an "end product" *could* be an article of manufacture, however, that would be consistent with the historical evidence.

398. *See* Apple Inc. v. Samsung Elecs. Co., 786 F.3d 983, 1002 (Fed. Cir. 2015); Nordock, Inc. v. Sys. Inc., 803 F.3d 1344, 1354–55 (Fed. Cir. 2015).

machine."[399] The historical evidence shows that not all "thing[s] made by hand or machine" were considered "articles of manufacture" in 1887.

As discussed above, machines were not considered articles of manufacture.[400] But machines are "thing[s] made by hand or machine," and would, therefore, fall under the Supreme Court's definition.[401] Product packaging is certainly "made by hand or machine" but at least one case indicates that packaging was not considered an "article of manufacture."[402] Even in *Lewis*, where the Commissioner defined "manufacture" as "articles made by hand, machinery, or art, from raw or prepared materials," he also ruled that this seemingly very broad definition did not include houses.[403] Therefore, in 1887, the phrase "article of manufacture" did not include any and all "thing[s] made by hand or machine."[404]

### *3. In 1887, Not All "Components" Were Articles of Manufacture*

In *Samsung v. Apple*, the Supreme Court held that "[t]he term 'article of manufacture,' as used in § 289, encompasses both a product sold to a consumer and a component of that product."[405] This statement might be read as suggesting that any "component" can be an "article of manufacture" for the purposes of § 289.[406]

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399. *See Samsung*, 137 S. Ct. at 435 ("An article of manufacture, then, is simply a thing made by hand or machine.").

400. *See supra* Section V.A.

401. *See Samsung*, 137 S. Ct. at 435; *see also* Mueller, *supra* note 73, at 7 n.21 ("[W]hile Professor Robinson's definition of 'manufacture' . . . includes the parts of a machine, it excludes the 'machine itself,' contrary to the Supreme Court's definition of 'article of manufacture' in *Samsung Elecs*.").

402. Pratt v. Rosenfeld, 3 F. 335, 337 (C.C.S.D.N.Y. 1880).

403. *Ex parte* Lewis, 1891 Dec. Comm'r Pat. 61, 63.

404. *See Samsung*, 137 S. Ct. at 435 (interpreting the phrase "article of manufacture" in 35 U.S.C. § 289 to mean "simply a thing made by hand or machine"). Nor did it mean—as Apple, Samsung, and the Government argued in the Supreme Court—"any item that is made by human labor." *See* Gov't Brief, *supra* note 87, at 17; Apple Merits Br., *supra* note 98, at 36 (citing Gov't Brief, *supra* note 87, at 17); Reply Brief for Petitioners at 2–3, Samsung Elecs. Co. v. Apple Inc., 137 S. Ct. 429 (2016) (No. 15-777), 2016 WL 4524542 (quoting Gov't Brief, *supra* note 87, at 17).

405. *Samsung*, 137 S. Ct. at 434 (2016).

406. *See* Michael Risch, Samsung v. Apple*: Drilling Down on Profit Calculations*, WRITTEN DESCRIPTION (Dec. 6, 2016), http://writtendescription.blogspot.com/2016/12/samsung-v-apple-drilling-down-on-profit.html (apparently interpreting the decision this way).

In 1887, a component of a larger product could be an "article of manufacture."[407] But not all "components" were articles of manufacture—at least not in the sense that we understand the word "component" today. Today, a "component" can be "any part of a larger whole,"[408] including intangible characteristics and incomplete fragments of a product. Today, we might describe the pile yarn as a "component" of a carpet.[409] Or we might consider the "front" of a carpet and its "backing" as separate components.[410] We might even describe color or the type of fibers used as "components" of a particular carpet.[411] Of these things, the only ones that might have qualified as being "articles of manufacture" in 1887 were the yarn and the backing fabric.[412] If one were to just cut off the "front" of a rug—i.e., to

407. *See, e.g.*, *Ex parte* Brower, 1873 Dec. Comm'r Pat. 151, 152 (holding that the applicant could not claim designs for an inkstand and stopper in a single application because they did not constitute "a single unitary design for an article of manufacture"); *Ex parte* Wiessner, 1898 Dec. Comm'r Pat. 236, 237 (affirming the examiner's requirement of a division because, *inter alia*, the headboard and footboard were "separate and distinct articles of manufacture," even though they were "parts or elements of the entire bedstead"); *see also* Simpson v. Davis, 12 F. 144, 145–46 (C.C.E.D.N.Y. 1882) (suggesting, though not deciding, a cap for a newel post could be a separate "manufacture" because the cap was "often manufactured by itself," even though it was "never used except in connection with other parts . . . to make up what is known as a newel post"); *Ex parte* Lewis, 1891 Dec. Comm'r Pat. 61, 63 (stating that "articles, such as mantels," which "are manufactured and sold with reference to ultimately becoming part of a house" were articles of manufacture, even though the house was not).

408. CONCISE OXFORD ENGLISH DICTIONARY 293 (11th ed., rev'd 2008) (Catherine Soanes & Angus Stevenson, eds.) (defining "component," in relevant part, as: "a part or element of a larger whole, especially a part of a machine or vehicle"); *see also* THE AMERICAN HERITAGE COLLEGE WRITER'S DICTIONARY 203 (2013) (defining the noun "component" as "[o]ne of the parts that makes up a whole"); A.S. HORNBY, OXFORD ADVANCED LEARNER'S DICTIONARY OF CURRENT ENGLISH 306 (8th ed. 2010) (Joanna Turnbull, ed.) (defining the noun "component" as "one of several parts of which [something] is made").

409. CORKY BINGGELI, INTERIOR GRAPHIC STANDARDS: STUDENT EDITION 210 (2011) ("Pile yarn is the most expensive component in carpet manufacturing." (emphasis omitted)).

410. *See* Risch, *supra* note 406 (stating, in *Dobson*, the carpet "had a design on the front, but also had an unpatented backing, etc." and arguing that "[a]lthough there were at least two components, no one at the time Congress passed the law thought for a second that the profits for each component should be considered separately").

411. *See* DONALD A. BURNS & EMIL W. CIURCZAK, HANDBOOK OF NEAR-INFRARED ANALYSIS 509 (3d ed. 2007) ("The carpet components evaluated were fiber type, color, carpet and yarn construction, and dyeing/coloration method").

412. *See generally* CURTIS, *supra* note 155, at § 9 (describing "fabrics or substances made by the art or industry of man" as examples of manufactures). *But see Ex parte* Sellers, 1872 Dec. Comm'r Pat. 197, 198 (stating that an "article of manufacture" must be

sever the loops of fabric—that would not result in a complete, tangible and vendible item. And a color or fiber type certainly would not qualify. Therefore, not everything that we might think of today as a "component" of a product would have qualified as an "article of manufacture" in 1887.

### C. THE HISTORICAL EVIDENCE SHEDS NEW LIGHT ON THE ORIGINAL CONGRESSIONAL INTENT

Over the course of the *Apple* and *Nordock* cases, many arguments have been made regarding the original congressional intent. This Section explains what the 45th Congress apparently did and did not intend when it passed the 1887 Act.

#### *1. What the 45th Congress Did Intend*

The legislative history shows Congress did intend to change the result in *Dobson*.[413] Specifically, Congress intended to eliminate the possibility that a design patent owner would receive only nominal damages in cases of commercial infringement.[414] To this end, Congress provided for an automatic penalty of $250 for any violation of the statute, regardless of whether the patent owner could prove it was entitled to any profits or damages.[415] Congress also provided that, where the patent owner could prove the infringer made over $250 in "total profit . . . from the manufacture or sale . . . of the article or articles to which the design, or colorable imitation thereof, has been applied," the patent owner could recover those additional profits.[416]

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"complete in itself *for some special use*, and not to be applied to general purposes like pipes or tubes" (emphasis added)).

413. It is not clear Congress intended to completely overrule *Dobson* in every respect. *See, e.g.*, S. REP. NO. 49-206, at 2 (1886) (appearing to contemplate at least some of "the technical rules of the law as laid down by the Supreme Court" in *Dobson* would continue in effect, thus necessitating the provision of the $250 penalty).

414. Specifically, Congress was concerned about cases where the defendant "appl[ied] the design secured by such letters patent, or any colorable imitation thereof, to any article of manufacture for the purpose of sale" without authorization or where the defendant sold or "expose[d] for sale any article of manufacture to which such design or colorable imitation shall, without the license of the owner, have been applied, knowing that the same has been so applied." *See* Act of Feb. 4, 1887, ch. 105, 24 Stat. 387, 387.

415. *See supra* Section IV.B.2.

416. Act of Feb. 4, 1887, ch. 105, 24 Stat. 387, 387; *see also* FENTON, *supra* note 186, at 188 (stating the 1887 Act would "have no operation" in a case where the plaintiff could "offer such proof of actual damages or profits as would warrant a verdict of a jury or a finding of a master, for a sum exceeding two hundred and fifty dollars.").

By using the phrase "total profit," the 45th Congress apparently intended to avoid the type of apportionment required by *Dobson*—i.e., apportionment between the profits attributable to the ornamentation and/or configuration of the article and the profits attributable to the "intrinsic merits of quality and structure" of the article itself.[417] But the legislative history provides no indication Congress intended this "total profits" option to be the default remedy. Nor is there any indication Congress intended for a "total profits" award to be available—or easy to prove—in any and all cases of infringement.[418] There is also no indication Congress meant to change or affect the parties' burdens of proof with respect to patent damages.[419] To the contrary, both the House and Senate reports expressly contemplate that the patentee would continue to bear the burden of proving its entitlement to profits or damages.[420]

Additionally, the phrase "total profit" was qualified; the plaintiff was not entitled to recover the "total profit" of the defendant's entire commercial enterprise. Instead, the plaintiff was entitled to recover the "total profit" the defendant made "from the manufacture or sale . . . of the article or articles [of manufacture] to which the design, or colorable imitation thereof, has been applied."[421] As used in this passage, "the design" refers to the patented design—i.e., "the design secured by such letters patent."[422] Therefore, to determine the relevant article (or articles) for the purposes of the 1887 Act, one has to consider the nature of what constituted a patentable "design" in 1887.

Section 4929 of the Revised Statutes was interpreted as covering two different classes of design—"configuration" and "surface ornamentation."[423] A patentable configuration design had to "relate to the outward form or contour" of an article of manufacture, while "surface

417. *See* Dobson v. Hartford Carpet Co., 114 U.S. 439, 445–46 (1885).

418. Indeed, to the extent that the legislative history speaks to these issues at all, it indicates the opposite.

419. By 1887, it was well-established "[t]he burden of proving damages for the infringement of a patent is upon the plaintiff, and he must establish his damages by competent evidence . . . ." Hunt Bros. Fruit Packing Co. v. Cassidy, 53 F. 257, 261–62 (9th Cir. 1892) (citing Garretson v. Clark, 111 U.S. 120, 121 (1884); Blake v. Robertson, 94 U.S. 728, 733 (1876)).

420. *See* H.R. REP. NO. 49-1966, at 3 (1886); S. REP. NO. 49-206, at 2 (1886).

421. Act of Feb. 4, 1887, ch. 105, 24 Stat. 387, 387. As noted above, the Federal Circuit has read this qualifier into § 289. *See supra* note 350.

422. *See* Act of Feb. 4, 1887, ch. 105, 24 Stat. 387, 387.

423. *See Ex parte* Gérard, 1888 Dec. Comm'r Pat. 37, 40.

ornamentation relate[d] to illustrations and delineations that are printed or impressed upon or woven into it."[424]

Although there is no case law directly on point, it appears clear the relevant article of manufacture for a configuration design (or a design consisting of both a configuration and surface ornamentation) for the purposes of the 1887 Act would be the article of manufacture for which the design was created.[425] This would be true even if that article were later incorporated into a larger article. In the case of a design patent for the configuration of a casket–screw, the relevant article of manufacture would be the casket–screw, not the casket.[426] Of course, if the defendant only sold caskets, not casket–screws, it would be difficult to prove what profits the defendants received just from the screws. But there is no indication that the 1887 Act was meant to make it easy for plaintiffs to prove "total profits" in every case.[427] Indeed, this appears to be one of the very situations that the $250 minimum penalty was designed for.[428]

There is some indication that some design patents for surface design might have had more than one relevant "article of manufacture" for the purposes of the 1887 Act. For example, in *Amberg*, although the Patent Office would not let the applicant claim its design by reference to any articles other than those to which the applicant had already applied the design, the decision suggested that applying the design to other articles might, in appropriate circumstances, constitute an act of infringement.[429]

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424. *See id*.

425. *See id*. (referring to "*the* outward form or contour," singular (emphasis added)); *see also* Rev. Stat. § 4929 (providing for design patents for "any new, useful, and original shape or configuration *of* any article of manufacture," again suggesting any given article only had one shape or configuration (emphasis added)).

426. *See generally* Apple Merits Br., *supra* note 98, at 37 ("[M]any design patents covered designs of coffin parts - several issued in 1884 alone - such that it was conceivable that a single casket could incorporate four different patented designs. *E.g.*, D15,033 (casket handle); D15,014 (casket knob); D15,043 (coffin screw); D14,641 (casket plate)."). As discussed in more detail below, in 1887, a design for the configuration of a part was not considered a design for a larger composite whole. *See infra* Section V.C.2.b).

427. *See id*.

428. *See* S. REP. NO. 49-206, at 2 (1886) (noting the $250 minimum penalty was meant to apply where the plaintiff could not prove "the exact profit in dollars and cents"); *see also See* Young v. Grand Rapids Refrigerator Co., 268 F. 966, 974 (6th Cir. 1920) ("Any segregation of the profits due to the use of this particular design of latch casing is obviously impossible. The statute was passed, we think, to provide for cases of this character, and to prevent the otherwise inevitable result of a recovery of merely nominal damages.").

429. *See Ex parte* Amberg, 1898 Dec. Comm'r Pat. 117; *see also In re* Schnell, 46 F.2d 203, 209 (C.C.P.A. 1931).

Therefore, in the case of a design patent claiming a design for surface ornamentation, it might be possible for the defendant "to apply the design secured by such letters patent"[430] to articles other than the ones "invented and produced" by the patentee.[431] In any case, the result in cases like *Dobson* would have been very different following the enactment of the 1887 Act. The carpet–makers who sued the Dobsons would have been able to recover at least $250 per design patent—and more if they could prove the Dobsons' total profit on the infringing carpets.

Thus, different rules applied to surface ornamentation designs, on the one hand, and configuration and combination design, on the other. This is neither particularly surprising nor problematic because these types of designs are, by their very nature, different—a fact that was recognized in nineteenth century design patent law.[432]

This distinction also comports with the House Report's stated justification for allowing an award of "the entire profit on the article."[433] The House Report stated this type of award was "just" because "it is the design that sells the article, and so that makes it possible to realize any profit at all."[434] It is plausible—or at least, not absurd—to think that, when a consumer chooses between two otherwise similar articles and selects one with surface ornamentation, that ornamentation is material to the purchasing decision.[435] If a consumer decides to buy a carpet with one particular scheme of surface decoration over another carpet that has no decoration or a different scheme of decoration, it makes sense to surmise that the design

430. *See* Act of Feb. 4, 1887, ch. 105, 24 Stat. 387, 387.

431. *Ex parte* Amberg, 1898 Dec. Comm'r Pat. 117, 118.

432. *See generally supra* Section II.A.2.

433. H.R. REP. NO. 49-1966, at 3 (1886).

434. *See id.*

435. And back then, "ornamentation" actually meant "ornamentation"—not "indicia" or "treatment" or "anything not strictly required for utility." *Compare Ex parte* Gérard, 1888 Dec. Comm'r Pat. 37, 40 ("Shape must relate to the outward form or contour, while the surface ornamentation relates to illustrations and delineations that are printed or impressed upon or woven into it."), *and* Rev. Stat. § 4929 (providing for design patents for "any new and original impression, ornament, [pattern], print, or picture to be printed, painted, cast, or otherwise placed on or worked into any article of manufacture"), *with, e.g.*, MPEP, *supra* note 21, at § 1503.02(IV) ("The ornamental appearance of a design for an article includes its shape and configuration as well as any indicia, contrasting color or materials, graphic representations, or other ornamentation applied to the article ('surface treatment')"); *see also* Burstein, *supra* note 28, at 1457–58 (explaining how the Federal Circuit has interpreted the term "ornamental" in 35 U.S.C. § 171).

is "sell[ing] the article."[436] The same is true for a consumer who selects chairs with a particular shape over other chairs. But it strains credulity to suggest that every time an article of manufacture is incorporated into a larger article of manufacture, the shape of the part necessarily "sells" the larger article. While the shape of a casket–screw might "sell the article" to the casket–maker, it is unlikely that the shape would drive sales of the finished casket. In that scenario, the owner of a design patent for a casket–screw could, upon proper proofs, recover the "total profits" of the person who sold the screws to the casket–maker. But they would only be able to recover $250 from the casket–maker, unless they could prove what portion of the casket profits were attributable to the screws.

This analysis is consistent with the results, if not the stated reasoning, in cases decided under the 1887 Act. In *Bush & Lane Piano Co. v. Becker Bros*., the court awarded $250 when the plaintiff could not prove "the profits made by the defendant . . . upon the sale of the [piano] case which alone is the sole subject of the patent."[437] Similarly, in *Young v. Grand Rapids Refrigerator Co.*, the court awarded $250 because it was too difficult to "determine what profits have been made by a sale of the article," which consisted of a part of a refrigerator latch.[438] And in *Untermeyer v. Freund*, where the design patent–in–suit claimed a design for watch cases, the court awarded the profits for the infringing cases—not for completed watches.[439]

### *2. Congress Did Not Intend the Results in* Apple *and* Nordock

In *Apple* and *Nordock*, the Federal Circuit ruled that the patentees were entitled to recover the "total profit" from the infringing products, even though the asserted patents only claimed designs for portions of those products.[440] Defenders of those rulings argue that the *Apple*/*Nordock* rule

436. H.R. REP. NO. 49-1966, at 3 (1886). This is true regardless of whether the "ornamented" part covers less than the entire surface of a particular article. Some designs for surface ornamentation are meant to cover an entire surface; others are not. And of course, a piece of carpet would have clearly qualified as an "article of manufacture." *See supra* Section V.A.

437. *See* 222 F. 902, 903 (2d Cir. 1915).

438. *See* 268 F. 966, 973–74 (6th Cir. 1920).

439. *See* 50 F. 77, 77–78 (C.C.S.D.N.Y. 1892). Even though the Second Circuit decision makes reference to infringing "watches," *see, e.g.*, Untermeyer v. Freund, 58 F. 205, 209 (2d. Cir. 1893), it is clear from the decision below that the master's recommendation is actually based on sales of infringing watch *cases*. *See* Untermeyer v. Freund, 50 F. 77, 77–78 (C.C.S.D.N.Y. 1892).

440. *See supra* Section III.B.1. Although a full discussion of these issues is beyond the scope of this Article, it's worth noting the rules for design patent claiming—and the effect of design patent claims upon the ultimate patent scope—were very different in 1887 than

reflected the original congressional intent.[441] However, the historical evidence indicates that Congress did not intend for Apple to recover the total profit from the infringing Samsung smartphones or for Nordock to recover the total profit from the infringing Systems dock levelers.

a) Smartphones and Dock Levelers Would Not Have Been Considered "Articles of Manufacture" in 1887

In *Apple*, the infringing products were smartphones.[442] A smartphone is a computer.[443] "Computers are machines."[444] And machines were not considered articles of manufacture.[445] Therefore, the infringing smartphones would not have been considered "articles of manufacture" in 1887.[446] Any parts that were complete in and of themselves and

they are today. *See, e.g.*, *Ex parte* Pope, 1883 Dec. Comm'r Pat. 74; *Ex parte* Gérard, 1888 Dec. Comm'r Pat. 37.

441. Brief of Amicus Curiae American Intellectual Property Law Association in Support of Respondent at 2, Samsung Elecs. Co. v. Apple Inc., 137 S. Ct. 429 (2016) (No. 15-777), 2016 WL 4268252 ("The legislative history of Section 289 supports the plain meaning of the statutory language and demonstrates the policy decision Congress made in providing this remedy to design patent owners."); Brief of Amicus Curiae Crocs, Inc. in Support of Affirmance at 29, Samsung Elecs. Co. v. Apple Inc., 137 S. Ct. 429 (2016) (No. 15-777), 2016 WL 4239196 ("Congress's decision to protect design through the total-profits remedy is working as intended, and there is no sound basis to change it.").

442. *See supra* Section III.B.1.a).

443. Matt Buchanan, *Giz Explains: How Multitasking Works on a Phone*, GIZMODO (Apr. 29, 2010), http://gizmodo.com/5527407/giz-explains-how-multitasking-works-on-a-phone ("A smartphone is a computer that fits in your pocket . . . ."); *see also generally* MICHAEL JUNTAO YUAN, NOKIA SMARTPHONE HACKS: TIPS & TOOLS FOR YOUR SMALLEST COMPUTER xvi (2005) ("A Nokia smartphone is not only a voice communications device, but also a fully featured computer capable of running third-party software.").

444. CLS Bank Int'l v. Alice Corp., 717 F.3d 1269, 1305 (Fed. Cir. 2013), *aff'd*, 134 S. Ct. 2347 (2014) (internal quotation marks omitted); *see also* Wireless Media Innovations, LLC v. Maher Terminals, LLC, 100 F. Supp. 3d 405, 414 (D.N.J. 2015), *aff'd*, 636 F. App'x 1014 (Fed. Cir. 2016) (quoting Alice Corp. v. CLS Bank Int'l, 134 S. Ct. 2347, 2358–59 (2014)) ("There is no dispute that a computer is a tangible system (in § 101 terms, a 'machine') . . . ." ). The fact that a smartphone lacks visibly moving parts while in operation does not change this analysis. Although some nineteenth–century Patent Office decisions seemed to conflate the "machine" issue with the moving parts issue, these were in fact separate inquiries. *See Ex parte* Steck, 1902 Dec. Comm'r Pat. 9, 13. And moving parts was never a universal requirement for "machines," though some commentators did seem to use movement as a proxy for machinery. *See supra* notes 169–172 and accompanying text.

445. *See* SYMONS, *supra* note 47, at 28 (citing *Ex parte* Adams, 1898 Dec. Comm'r Pat. 115; *Ex parte* Steck, 1902 Dec. Comm'r Pat. 9).

446. As noted above, there is no indication the 45th Congress meant the phrase "article of manufacture" to mean something different in the 1887 Act than it did in Rev. Stat. §

manufactured separately could have qualified as articles of manufacture. Design patents claiming designs for such parts would have been allowable but a design for the product as a whole would not have been. Thus, in 1887, Apple could not have gotten a patent for the design of an entire smartphone because a smartphone would not have been considered an "article of manufacture." As discussed above, there is no indication that Congress meant the phrase "article of manufacture" to mean something different in the Act of 1887 than it did in the existing design patent subject matter provision.[447] It strains credulity to imagine that Congress intended courts to treat the entire smartphone as the relevant "article of manufacture" for the purposes of the "total profit" remedy when it would not have been considered an "article of manufacture" at all.[448]

Similarly, in *Nordock*, the infringing products were dock levelers.[449] By any definition of the term, a dock leveler would have qualified as a "machine" in 1887.[450] So a design for an entire dock leveler would not have been patentable, even if the "lip and hinge plate" would have been. Because machines were excluded from the category of "articles of manufacture," a dock leveler simply could not have been the article of manufacture "to which the design . . . has been applied."[451]

b) In 1887, a Design for the Configuration of a Part Was Not Considered a Design for the Larger Composite Whole

The historical evidence indicates that in 1887, a design for a configuration of an article of manufacture that formed part of a larger article was considered distinct from a design for the configuration of that larger article. For example, in *Wiessner*, the configuration of a bedstead headboard

4929 or to make any other changes to the existing design patent law. *See supra* Section IV.B.2.

447. *See supra* Section IV.B.2.

448. *Cf.* Brief for The Internet Association et al. as Amici Curiae Supporting Petitioners at 18, Samsung Elecs. Co. v. Apple Inc., 137 S. Ct. 429 (2016) (No. 15-777), 2016 WL 3194217 [hereinafter Internet Ass'n Br.] ("If Congress would not have thought that a complex device was an 'article of manufacture' for purposes of patentability, it surely did not intend for such a device to be the relevant 'article of manufacture' in the 'total profit' provision.").

449. *See supra* Section III.B.1.b).

450. *See supra* Section IV.A.1.a).

451. Act of Feb. 4, 1887, ch. 105, 24 Stat. 387, 387 ("Any person violating the provisions, or either of them, of this section, shall be liable in the amount of two hundred and fifty dollars; and in case the total profit made by him from the manufacture or sale . . . *of the article or articles to which the design . . . has been applied*) (emphasis added).

was considered distinct from the configuration of the entire bedstead.[452] They were different designs for different articles of manufacture—even though one was ultimately used to construct the other.[453] The article of manufacture to which a design for the configuration of a headboard was "applied" would be the headboard—not the entire bedstead.[454]

In *Apple*, none of the infringed patents claimed a design for the configuration of a smartphone. But two of them claimed designs for the configurations of different parts of a smartphone. The D'677 patent claimed a design for the configuration and color of the iPhone screen.[455] The screen is manufactured separately and could be sold separately, either to another manufacturer or as a replacement part; therefore, the screen would be the relevant "article of manufacture" in 1887. The D'087 patent claimed a design for the configuration of the front screen and the bezel.[456] The screen and bezel could have been considered separate articles of manufacture in 1887.[457] If they were considered separate articles of manufacture, this claim would not have been allowed in 1887.[458] But if it were, the relevant article of manufacture would have been the bezel and the screen conglomeration, not the completed smartphone.

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452. *See Ex parte* Wiessner, 1898 Dec. Comm'r Pat. 236.

453. *See id.* at 238 ("That the designs covered by claims 1 and 2, viz., the headboard and the footboard, are separate and distinct articles of manufacture, is well recognized in the art." (quoting the examiner)); *id.* at 242 ("The fact that these articles may be united and form still another article of manufacture furnishes no reason for allowing them in one case."); *see also generally Ex parte* Patitz, 1883 Dec. Comm'r Pat. 101, 102; *Ex parte* Brand, 1898 Dec. Comm'r Pat. 62, 63.

454. *See* Act of Feb. 4, 1887, ch. 105, 24 Stat. 387, 387 (providing for the disgorgement of the defendant's "total profit made by him from the manufacture or sale . . . of the article or articles to which the design . . . has been applied").

455. *See supra* note 92 and accompanying text.

456. *See supra* note 94 and accompanying text.

457. *See, e.g.*, *Ex parte* Brand, 1898 Dec. Comm'r Pat. 62, 63 (affirming the rejection of a design patent application "for the parts of a joint for bedstead-rails" even though they were "adapted to interlock"). Also, it is questionable whether a freestanding bezel-and-screen combination would have been considered sufficiently "complete" on its own. *See Ex parte* Blanchard, 1870 Dec. Comm'r Pat. 59, 59 ("[T]he word 'manufacture,' as used in the patent act . . . . fairly covers only such manufactured articles or products as are complete in themselves, or, if parts of a whole, are so far complete as to be the subject of separate manufacture and sale."). It might have also been considered "a mere fraction of a machine*." See id.*

458. *See, e.g.*, *Ex parte* Patitz, 1883 Dec. Comm'r Pat. 101; *Ex parte* Wiessner, 1898 Dec. Comm'r Pat. 236.

Similarly, in *Nordock*, the D'754 claimed a design for the configuration of a "lip and hinge plate" for a dock leveler.[459] Based on the reported decisions in *Nordock*, it is not clear whether the lip and hinge plate was manufactured separately or whether it had a unitary structure. If it was not, the plate would not have been considered an article of manufacture and the configuration claimed in the D'754 patent would not have been patentable in 1887. Assuming the plate would have qualified as an article of manufacture, it is clear that the plate—not the dock leveler—would have been the relevant article.

Therefore, even if smartphones and dock levelers would have been considered "articles of manufacture" in 1887, they would not have been the relevant articles of manufacture for the design patents at issue in *Apple* and *Nordock*.[460]

c) In 1887, GUI Designs Were Not Even on the Horizon

The third patent infringed in *Apple*, the D'305 patent, claimed a design for a GUI.[461] Of course, GUI designs did not exist—and could not have been anticipated—by the 45th Congress.[462] Thus, the 45th Congress did not actually intended for the owner of a GUI design patent to recover the "total profit" from an entire smartphone.

It could be argued that GUIs are surface ornamentation[463] and that, therefore, the 45th Congress could have fairly anticipated and did intend this kind of result. However, it is difficult to fairly analogize GUI designs to anything that was considered design patentable subject matter in 1887. In 1887, the category referred to as "surface ornamentation" was more specifically described in the statute as "any new and original impression, ornament, [pattern], print, or picture to be printed, painted, cast, or

459. *See supra* notes 116–118 and accompanying text.

460. In 1930, the CCPA decided that there was no reason a design for a machine could not be the subject of a design patent. *In re* Koehring, 37 F.2d 421, 424 (C.C.P.A. 1930). As discussed above the reasoning in *Koehring* was quite thin and did not address the *expressio unius* issue. *See supra* note 374. Nonetheless, some may argue that Congress tacitly approved and adopted *Koehring* when it enacted the Patent Act of 1952.

461. *See supra* note 96 and accompanying text.

462. And, as noted above, the legitimacy of this type of design patent is both highly debatable and untested. *See supra* notes 78–79 and accompanying text.

463. The USPTO considers GUIs to be "surface ornamentation." MPEP, *supra* note 21, at § 1504.01(a)(I)(A) ("Computer-generated icons, such as full screen displays and individual icons, are 2-dimensional images which alone are surface ornamentation") (citing *Ex parte* Strijland, 26 U.S.P.Q.2d (BNA) 1259 (Bd. Pat. App. & Int. 1992)). This is highly questionable; however, a full discussion of this issue is beyond the scope of this Article.

otherwise placed on or worked into any article of manufacture. . . ."[464] Perhaps some GUI designs—or portions thereof, such as icon designs—could be considered "patterns" or "pictures."[465] But in 1887, a protectable surface ornamentation design had to be "printed, painted, cast, or otherwise placed on or worked into [the relevant] article of manufacture."[466] It is difficult to argue that a GUI design is "placed *on* or worked *into*" a smartphone in any meaningful sense of those phrases.[467] Indeed, if a GUI design is "placed on or worked into" anything, it is "placed on or worked into" the smartphone screen—not the smartphone as a whole.[468] The relevant article of manufacture, if any, would have to be the screen, not the entire smartphone. That would entitle Apple to $250 or the profits from just the screen, if Apple chose to seek monetary relief under § 289.[469]

## VI. POTENTIAL OBJECTIONS

This analysis of the historical evidence may draw several objections. This Section discusses the most serious of those potential objections.

### A. THIS CANNOT BE RIGHT BECAUSE CONGRESS INTENDED TO ELIMINATE APPORTIONMENT

It may be argued that the conclusions drawn in this Article must be incorrect because Congress intended to eliminate any and all

464. 1 REVISED STATUTES OF THE UNITED STATES 954 (2d ed. 1878) (reproducing Rev. Stat. § 4929, as then in force); *see also* WALKER, *supra* note 156, § 20 (explaining that the word "patent" in the phrase "impression, ornament, patent, print, or picture" appeared to be a typo).

465. This is highly questionable. However, a full discussion of this issue is beyond the scope of this Article.

466. 1 REVISED STATUTES OF THE UNITED STATES 954 (2d ed. 1878).

467. *See* Seymour & Torrance, *supra* note 11, at 208–14 (arguing that computer–generated imagery "is not fixed within or worked into displays"). And, of course, as discussed above, a smartphone would not have been considered an "article of manufacture" in 1887. *See supra* Section V.C.2.a).

468. *See supra* Section III.A.3 (noting that, according to the USPTO, the relevant "article of manufacture" for a GUI design patent is the screen itself, not the device in which the screen is incorporated or embedded). It's also worth noting that the D'305 patent is entitled "Graphical User Interface *for a Display Screen* or Portion Thereof." U.S. Patent No. D604,305 fig.2 (issued Nov. 17, 2009) (emphasis added). However, a contemporary patent's title and the patentee's intent should not be dispositive because, today, the USPTO lets applicants name their patents pretty much whatever they want. *See* MPEP, *supra* note 21, at § 1503.01(I).

469. Of course, there are other remedies available. *See* Burstein, *Costly Designs*, *supra* note 1, at 118–19.

"apportionment."[470] It is true that the 45th Congress was concerned with "apportionment" but only in one particular sense—namely, apportionment between the profits attributable to the *design itself* and those attributable to the "intrinsic merits of quality and structure" of *the article itself*.[471] In other words, Congress meant to foreclose any apportionment between the profits from the configuration or surface ornamentation and the other, non–aesthetic characteristics of the article to which that configuration or surface ornamentation was applied. But Congress expressly disavowed any intention to change the design patent law in any other way.[472] Nothing in the 1887 Act changed the meaning of the well–established term of art "article of manufacture." Nor did it change the well–settled understanding of what constituted a patentable "design."

This Article's interpretation of the text of the 1887 Act and its legislative history would not require any differentiation between the profits attributable to the configuration of a casket–screw and the underlying intrinsic merits of a screw to which that design was applied. Accordingly, this reading does not "reinstitute the apportionment rule from the *Dobson* cases."[473] Instead, it merely recognizes that the screw itself was a separate "article of manufacture" and that the configuration of a casket–screw is not the same thing as the configuration of a casket.[474]

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470. *See* Mueller, *supra* note 73, at 1 (arguing that, by recognizing that a component can be an article of manufacture, the Supreme Court "reinstitute[d] apportionment"); *see also* Brief of Amici Curiae On Behalf of Intellectual Property Professors in Support of Respondent at 27, Samsung Elecs. Co. v. Apple Inc., 137 S. Ct. 429 (2016) (No. 15-777), 2016 WL 4239412 [hereinafter Janis S. Ct. Br.] (arguing "that Congress slammed the door on apportionment by using the term 'total'"); *id*. at 26 ("The Phrase 'Article of Manufacture' Does Not Authorize a Back-Door, Quasi-Apportionment Analysis.").

471. *See supra* note 335 and accompanying text; *see also* Apple Inc. v. Samsung Elecs. Co., 786 F.3d 983, 1001 (Fed. Cir. 2015), *rev'd and remanded*, 137 S. Ct. 429 (2016) ("Apportionment required [the patentee] to show what portion of the infringer's profit, or of his own lost profit, was *due to the design* and what portion was *due to the article itself*. The Act of 1887, specific to design patents, removed the apportionment requirement." (quoting Nike, Inc. v. Wal-Mart Stores, Inc., 138 F.3d 1437, 1441 (Fed. Cir. 1998)) (alteration in original)).

472. *See* S. REP. NO. 49-206, at 2 (1886); H.R. REP. NO. 49-1966 at 4 (1886).

473. *See* Janis S. Ct. Br., *supra* note 470, at 8 (arguing, in *Samsung*, the Court was "being asked to reinstitute the apportionment rule from the *Dobson* cases").

474. *See supra* Section V.C.2.b).

### B. THE STATUTE SAYS "ANY ARTICLE," SO CONGRESS MUST HAVE MEANT FOR THE RELEVANT "ARTICLE" TO BE THE WHOLE INFRINGER'S PRODUCT

It has been argued that, because § 289 refers to "*any* article of manufacture," "the infringer's product may be anything that bears the design."[475] A similar argument could be made based on the text of the 1887 Act.[476] This argument appears to be based on an unstated assumption that design patents do—or should—protect designs per se.[477] There are no cases that support that proposition; indeed, the only reported cases are to the contrary.[478] It is true that, in the nineteenth and early twentieth centuries, some cases and Patent Office decisions left open the possibility that design patents for surface ornamentation could be infringed by use of the design on articles other than the ones "invented and produced" by the patentee.[479] It is not clear how often, if ever, courts actually found that a surface ornamentation design for one article was infringed by the use of the design on a different type of article.[480] But, in any case, this was not the rule for configuration designs. Configuration designs are, by their very nature, are inextricably intertwined with their respective articles.[481] Moreover, this argument seems to assume that "article of manufacture" is a synonym for "product." As discussed above, that was not true in 1887.[482]

475. *See* Janis S. Ct. Br., *supra* note 470, at 26–27.

476. *See* Act of Feb. 4, 1887, ch. 105, 24 Stat. 387, 387 (also referring to "any article").

477. *See generally* Burstein, *The Patented Design*, *supra* note 1.

478. *See id*.

479. *See supra* note 429 and accompanying text.

480. Prior commentators have said that "surface ornamentation cases—such as those involving sheet material— . . . often result[ed] in infringement findings, even when the design is applied to an altogether different article, such as a carpet, rug, wall-paper, garment, or oil cloth." Jason J. Du Mont & Mark D. Janis, *Design Patent Remedies* at 6-50, *in* AMERICAN DESIGN PATENT LAW: A LEGAL HISTORY (forthcoming), http://ssrn.com/abstract=2784746. They do not, however, cite any such cases. *See id*. To date, the author has been unable to find any.

481. It may be argued this conflates the protected "design" with the underlying article itself. *See generally* Mueller, *supra* note 73, at 6 n.19. But that is not the case. There is nothing inconsistent about saying a design—*i.e.*, the patented invention—is distinct from the article itself while acknowledging that a configuration design is inextricably tied to the nature of the article. For example, the configuration of a shoe would simply not work as a configuration for a fork.

482. *See supra* Section V.B.1.

### C. NOT ALL ISSUED PATENTS FIT THIS INTERPRETATION

Some design patents issued prior to 1887 may not seem to fit this interpretation of "article of manufacture." However, the mere existence of such patents does not negate the conclusions drawn here. The Patent Office was notoriously lax in granting design patents in the nineteenth century.[483] It appears that the Patent Office did not start taking design patents seriously until sometime around 1870.[484] And of course, in any age, human institutions are prone to human error. A nineteenth–century design patent examiner could make a mistake as easily as a twenty–first–century design patent examiner.[485] Thus, nineteenth–century design patents are not particularly reliable sources for discerning principles of nineteenth–century patent law or Patent Office policy. The latter is especially true in instances where a granted patent conflicts with an express statement of Patent Office policy. It would not be surprising to find design patents, especially those issued before 1870, that claimed—or appeared to claim—designs for items that do not appear to meet the definition of "article of manufacture" discussed in this Article. But that does not mean the definition is incorrect.

Additionally, some nineteenth–century design patents may claim designs for items that do not appear, at least to a modern reader, to be separately–vendible items. For example, there were a number of design patents granted in the nineteenth century for chair–backs.[486] That might not immediately seem like a separately–vendible item.[487] However, in the nineteenth century, chair backs were often manufactured separately.[488]

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483. *See* SYMONS, *supra* note 47, at 1–2.

484. SIMONDS, *supra* note 172, at 182; *see also Ex parte* Bartholemew, 1869 Dec. Comm'r Pat. 103, 103 (discussing a recent uptick in interest in design patents).

485. And of course, the mere fact that the Patent Office made a mistake once does not mean it should be compelled to repeat it. *See generally Ex parte* Adams, 1898 Dec. Comm'r Pat. 115, 117 ("It is immaterial whether design patents of this kind have or have not heretofore been granted, since a practice not well founded in law should not be followed.").

486. *See e.g.*, Pattern for Chair Backs, U.S. Patent No. D22,328 (issued Apr. 4, 1893).

487. *See, e.g.*, Du Mont & Janis, *supra* note 480, at 6-50 (stating that, in the nineteenth century, "patents were . . . regularly granted for the components of (three dimensional) shapes or configurations that were not likely sold as completed products, protecting designs for things like the back of a chair . . . .").

488. *See, e.g.*, PARVIZ NAVI & DICK SANDBERG, THERMO-HYDRO-MECHANICAL PROCESSING OF WOOD 45 (2012) (discussing U.S. Patent No. 19405 (issued Feb. 23, 1858) for a method of mass–producing chair–backs); *see also* ALBERT JACKSON & DAVID DAY, CARE & REPAIR OF FURNITURE 46 (1995) (stating the three main methods of chair construction are "frame construction, stick construction, and bentwood"); *id*. at 46–47 (showing one component of a frame chair is the cresting rail, which is "[s]awn and shaped from one piece of wood"); *id*. at 48 (showing cresting rails could also be used with stick

Thus, they could have been sold separately to other manufacturers.[489] The fact that these pieces were meant to be incorporated into chairs would not have excluded them from the category of "articles of manufacture."[490] Indeed, *Simpson v. Davis* suggests that merely being manufactured as a separate piece might be enough to make something a separate "article of manufacture."[491]

Sometimes it is not clear from the face of a design patent whether an item was manufactured—let alone sold—separately.[492] Modern readers, like the original patent examiners, have to rely to some extent on the patentee's own disclosures. In any particular instance, an examiner might have missed—or an applicant might have intentionally obscured—some defect with respect to statutory subject matter. And nineteenth century patent applicants, like patent applicants today, were capable of strategic drafting. For example, after an initial rejection, the applicant in *Ex parte Sherman* attempted to amend the claims to omit any reference to the fact that the product to which its design was directed was actually made up of two separate pieces.[493]

Additionally, while some nineteenth–century design patents might appear to claim designs for "machines," that does not undermine the general principle that, in 1887, designs for "machines" were not considered to be design patentable subject matter. While it was clear that that designs for machines (at least, for full machines) could not be patented, the line between "machines" and "manufactures" was less clear.[494] As discussed above, there was disagreement over how to classify various tools and even pianos.[495] If a particular nineteenth–century design patent appears to modern eyes to fall

chairs); *id*. at 49 (stating the frames of late nineteenth–century bentwood chairs, like the one shown in U.S. Patent No. D17,448, "were made up from separate bent-wood units, usually screwed and bolted together" and that these chairs "were often shipped in parts for assembly by the purchaser").

489. *See supra* note 180.

490. *See, e.g.*, *Ex parte* Lewis, 1891 Dec. Comm'r Pat. 61, 63.

491. Simpson v. Davis, 12 F. 144, 145–46 (C.C.E.D.N.Y. 1882).

492. *See, e.g.*, Handle for Pokers and Like Instruments, U.S. Patent No. D16,786 (issued July 13, 1886).

493. *Ex parte* Sherman, 1899 Dec. Comm'r Pat. 240, 242 (noting, after having their application rejected for being composed of two separate and distinct articles of manufacture, the applicants amended their application to "disclos[e] the two tubes only in the position which they occupy when in use and containing no statement or indication that they can be separated.").

494. *See supra* Section IV.A.1.a).

495. *See id.*

on the "machine" side of the line, that may merely be the result of an honest difference of opinion.[496]

## VII. CONCLUSION

A close examination of the relevant statutory text, late nineteenth–century patent treatises, Patent Office decisions, and court cases shows that, in 1887, "article of manufacture" was a term of art referring to a tangible item made by humans—other than a machine or composition of matter—that had a unitary structure and was complete in itself for use or for sale. Therefore, in 1887, "article of manufacture" did not mean any "thing made by hand or machine."[497] Nor was "article of manufacture" a synonym for "product"—let alone a synonym for "the infringing product."[498] And while, in 1887, a component of a larger product could be an "article of manufacture," not all "components" were articles of manufacture.[499] Determining the relevant "article of manufacture" under the 1887 Act would not have been terribly difficult. For configuration or combination (configuration and ornamentation) designs, the article would have been the article identified in the patent.[500] For surface ornamentation designs, the infringing article could—in appropriate circumstances—be something other than what the patentee "invented and produced."[501] Additionally, while an article of manufacture had to be "vendible" in the sense that it had to be complete enough to be sold separately to someone—it did not have to actually be sold separately by any party to a particular patent dispute.[502] If the patentee could prove what profits the defendant made from the relevant

496. *See generally* SYMONS, *supra* note 47, at 28 ("There are some cases in which the question [of] whether a device is a manufacture or a machine is a close one.").

497. *Compare supra* Section V.B.2, *with* Samsung Elecs. Co. v. Apple Inc., 137 S. Ct. 429, 435 (2016).

498. *Compare supra* Section V.B.1, *with* Apple Inc. v. Samsung Elecs. Co., 786 F.3d 983, 1002 (Fed. Cir. 2015) (interpreting "article of manufacture" to mean whatever the defendant "sold separately . . . to ordinary purchasers"), *and* Nordock, Inc. v. Sys. Inc., 803 F.3d 1344, 1354–55 (Fed. Cir. 2015) (same). It also did not include any "sold to the consumer." *Compare supra* Section V.B.1, *with Samsung*, 137 S. Ct. at 434 ("The term 'article of manufacture,' as used in § 289, encompasses both a product sold to a consumer and a component of that product.").

499. *Compare supra* Section V.B.3, *with Samsung*, 137 S. Ct. at 434 ("The term 'article of manufacture,' as used in § 289, encompasses both a product sold to a consumer and a component of that product.").

500. *See supra* Section V.C.1 (discussing the nature of configuration designs, as understood in the late nineteenth century).

501. *See id.*

502. *See supra* Section V.B.1.

article, they would be entitled to the "total profit" from that article. If not, they would still be able to recover the $250 penalty.[503]

The historical evidence also provides support for at least part of the Supreme Court's decision in *Samsung v. Apple*. To the extent that the Court's decision in *Samsung* is read as ruling that the phrase "article of manufacture" could, at the time the special remedy was enacted, refer to a component of a larger product,[504] that reading is supported by the historical evidence.[505] On the other hand, to the extent the Court's decision can be read as ruling that in 1887, "article of manufacture" meant any "thing made by hand or machine,"[506] that would not be supported by the historical evidence.[507] Similarly, to the extent the Court's decision can be read as suggesting that in 1887, all "components" could be "articles of manufacture,"[508] that would not be supported by the historical evidence.[509]

This historical evidence also provides context for evaluating the Federal Circuit's initial interpretation of 35 U.S.C. § 289. In *Apple* and *Nordock*, the Federal Circuit interpreted the phrase "article of manufacture" in § 289 as a synonym for "the infringing product."[510] However, this interpretation ignores the fact that "article of manufacture" was a term of art in 1887, when the predecessor to § 289 was enacted. As discussed above, in 1887, "article of manufacture" did not mean "product" or "the infringing product."[511] And there is no indication that Congress intended to change the meaning of this phrase when it enacted the current version of § 289 when the Patent Act was

503. It may be that the statutory minimum of $250 should be increased to reflect inflation. But that is, of course, a question for Congress. It is also worth noting that § 289 is not the only provision under which a design patent owner can seek monetary relief. Like other patent owners, a design patent owner is free to seek relief, including treble damages, under 35 U.S.C. § 284. *See* Burstein, *Costly Designs*, *supra* note 1, at 118–19.

504. *See Samsung*, 137 S. Ct. at 434 (addressing the issue of "whether, in the case of a multicomponent product, the relevant 'article of manufacture' must always be the end product sold to the consumer or whether it can also be a component of that product"); *id.* at 435 (relying in part on a dictionary from 1885 in deciding "the term 'article of manufacture' is broad enough to encompass both a product sold to a consumer as well as a component of that product").

505. *See supra* Section V.B.1.

506. *See Samsung*, 137 S. Ct. at 435.

507. *See supra* Section V.B.2.

508. *See Samsung*, 137 S. Ct. at 435.

509. *See supra* Section V.B.3.

510. *See* Apple Inc. v. Samsung Elecs. Co., 786 F.3d 983, 1001–02 (Fed. Cir. 2015); Nordock, Inc. v. Sys. Inc., 803 F.3d 1344 (Fed. Cir. 2015).

511. *See supra* Section V.B.1.

overhauled in 1952.[512] Therefore, the Federal Circuit's interpretation did not reflect the "plain meaning" of the statute.[513]

The historical evidence also demonstrates that the 45th Congress did not intend the results in *Apple* and *Nordock*. Because the term "article of manufacture" was understood in 1887 to exclude machines, neither a smartphone nor a dock leveler could have been the relevant "article of manufacture."[514] And even if those items would not have been considered machines, they would not have been considered the relevant articles of manufacture; instead, the relevant articles would have been the separately–manufactured pieces for which the asserted designs were intended.[515] Therefore, the historical evidence indicates that the Federal Circuit's original interpretation of § 289 did not reflect either the "plain meaning" of the statute or the original congressional intent.

This historical evidence, therefore, provides important context for evaluating the history and meaning of § 289. As lower courts grapple with the question of how to interpret this provision, they should take this historical evidence into account.

512. *See supra* note 87.
513. *See* Lemley, *supra* note 377, at 1127.
514. *See supra* Section V.C.2.a).
515. *See id*.

# STANDING AGAINST BAD PATENTS

*Sapna Kumar*[†]

## ABSTRACT

Direct competitors possess the ability to challenge bad patents that hinder their ability to compete. However, numerous factors—including the cost of bringing such challenges and the fear of retaliation from patent holders—cause bad patents to remain unchallenged. In theory, members of the public who are harmed by the patents can bridge this gap by filing suit in federal court under the Administrative Procedure Act or the Declaratory Judgment Act. But in practice, the Federal Circuit has aggressively blocked such challenges using the administrative law doctrine of standing. The America Invents Act now provides the public with a robust mechanism for challenging bad patents in the Patent Trial and Appeals Board (PTAB). However, obstacles remain because public interest groups cannot appeal adverse PTAB decisions to the Federal Circuit if they cannot establish actual injury. This Article discusses the important role that the public plays in the patent system by challenging patents that direct competitors cannot or will not challenge. It contends that the Federal Circuit has distorted the Supreme Court's standing jurisprudence by making it significantly harder for third parties to establish that they are within the zone of interests of a statute. It further maintains that constitutional standing limits any challenges from public advocacy groups that have not experienced any direct harm. Finally, this Article makes suggestions to the PTO and Congress to facilitate patent challenges from members of the public.

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## I. INTRODUCTION

The doctrine of standing prevents unwanted litigants from challenging agency actions. Grounded in separation of powers,[1] the doctrine ensures that litigants are adverse, are directly concerned by the issue at hand,[2] and have

1. Allen v. Wright, 468 U.S. 737, 750 (1984) ("[T]he 'case or controversy' requirement defines with respect to the Judicial Branch the idea of separation of powers on which the Federal Government is founded. The several doctrines that have grown up to elaborate that requirement are founded in concern about the proper—and properly limited—role of the courts in democratic society.") (internal quotations omitted); *see also* Valley Forge Christian Coll. v. Ams. United for Separation of Church & State, Inc., 454 U.S. 464, 472 (1982) (noting how standing helps limit judicial power "to those disputes which confine federal courts to a role consistent with a system of separated powers and which are traditionally thought to be capable of resolution through the judicial process") quoting Flast v. Cohen, 392 U.S. 83, 97 (1968))); Carl Tobias, *Standing to Intervene*, 1991 WIS. L. REV. 415, 423–28 (1991) (discussing various rationales for standing).

2. *Valley Forge*, 454 U.S. at 472 ("[A]t an irreducible minimum, Art. III requires the party who invokes the court's authority to show that he personally has suffered some actual

a strong incentive to litigate.[3] Standing requires that parties suing an agency have a true stake in the outcome of the litigation.[4]

But standing can serve a more malicious purpose. In the 1930s, liberal Supreme Court Justices who supported the New Deal developed the doctrine to shield agencies from scrutiny.[5] As Justice Brennan observed, the doctrine has become "a catchall for an unarticulated discretion."[6] A court might decline to find standing based on political ideology[7] or as "caseload management" to keep the court's docket manageable.[8]

This harmful use of standing can be seen in patent law at the United States Court of Appeals for the Federal Circuit (Federal Circuit), which is a semi–specialized court.[9] Almost all patent cases appeal to the Federal

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or threatened injury as a result of the putatively illegal conduct of the defendant . . . .") (internal citation omitted).

3. *See id.* (explaining that standing ensures that legal issues will be resolved "in a concrete factual context conducive to a realistic appreciation of the consequences of judicial action"); Warth v. Seldin, 422 U.S. 490, 498–99 (1975) ("As an aspect of justiciability, the standing question is whether the plaintiff has 'alleged such a personal stake in the outcome of the controversy' as to warrant his invocation of federal-court jurisdiction and to justify exercise of the court's remedial powers on his behalf." (quoting Baker v. Carr, 369 U.S. 186, 204 (1962))).

4. *See Valley Forge*, 454 U.S. at 472–73; Sierra Club v. Morton, 405 U.S. 727, 740 (1972) ("The requirement that a party seeking review must allege facts showing that he is himself adversely affected . . . does serve as at least a rough attempt to put the decision as to whether review will be sought in the hands of those who have a direct stake in the outcome.").

5. *See* Daniel E. Ho & Erica L. Ross, *Did Liberal Justices Invent the Standing Doctrine? An Empirical Study of the Evolution of Standing, 1921–2006*, 62 STAN. L. REV. 591, 640 (2010) (showing that prior to 1940, liberal justices were empirically far more likely to deny standing); Robert J. Pushaw, *Justiciability and Separation of Powers: A Neo-Federalist Approach*, 81 CORNELL L. REV. 393, 458–59 (1996) (discussing how the New Deal Supreme Court used "justiciability to shield progressive legislation from conservative substantive due process challenges" and formulated new standing and ripeness doctrines "to prevent disruption of administrative agency processes").

6. Simon v. E. Ky. Welfare Rights Org., 426 U.S. 26, 66 (1975) (Brennan, J., dissenting) (internal quotation omitted).

7. *See* Richard J. Pierce, Jr., *Is Standing Law or Politics?*, 77 N.C. L. REV. 1741, 1744 (1999) (studying all courts of appeal decisions from 1993 to 1998 and finding that "Republican judges denied standing to environmental petitioners almost four times as often as did Democratic judges.").

8. *See Warth*, 422 U.S. at 519 (Douglas, J., dissenting) (noting that "[s]tanding has become a barrier to access to the federal courts" and "[t]he mounting caseload of federal courts is well known.").

9. *See* John M. Golden, *The Federal Circuit and the D.C. Circuit: Comparative Trials of Two Semi-Specialized Courts*, 78 GEO. WASH. L. REV. 553, 555 (2010) (arguing that the Federal Circuit is a semi–specialized court whose "grip on patent appeals is much more complete than the D.C. Circuit's grip on appeals involving administrative law."); Sapna Kumar, *Expert Court, Expert Agency*, 44 U.C. DAVIS L. REV. 1547 (2011) (arguing

Circuit; patent cases comprise more than sixty percent of the court's docket, and this number continues to grow.[10] Because of its repeated exposure to powerful institutional players, the Federal Circuit has traditionally been viewed as pro–patent[11] and at risk of capture by patent attorneys and interest groups.[12] It is therefore unsurprising that the Federal Circuit has used standing to prevent outsiders from gaining a foothold in the litigation process.[13] In this regard, the counter–majoritarian difficulty manifests itself in the Federal Circuit,[14] which can gain favor with the insular patent community by disregarding the will of Congress and, ultimately, the general

that the Federal Circuit acts as an expert in patent law and is the de facto administrator of the Patent Act).

10. Golden, *supra* note 9; Kumar, *supra* note 9; UNITED STATES COURT OF APPEALS FOR THE FED. CIRCUIT, APPEALS FILED BY CATEGORY: FY 2016 (2016), http://www.cafc.uscourts.gov/sites/default/files/the-court/statistics/FY16_Caseload_by_Category.pdf. This figure has significantly risen in the past few years. Jason Rantanen, *Federal Circuit Now Receiving More Appeals Arising From the PTO Than the District Courts*, PATENTLY-O (Mar. 2, 2016), https://patentlyo.com/patent/2016/03/receiving-appeals-district.html (discussing the dramatic rise in PTO appeals after passage of the AIA). Interestingly, in the 2011 Fiscal Year, only forty percent of the Federal Circuit's cases involved patents. Paul R. Gugliuzza, *Rethinking Federal Circuit Jurisdiction*, 100 GEO. L.J. 1437, 1439 (2011).

11. *See* David R. Pekarek-Krohn & Emerson H. Tiller, *Federal Circuit Precedent: An Empirical Study of Institutional Authority and Intellectual Property Ideology*, 2012 WIS. L. REV. 1177, 1183 (2012) (observing that "there is much commentary that the Federal Circuit has been a pro-patent court, even more pro-patent than some of the regional courts had been prior to the creation of the Federal Circuit," though many commentators observe the court appears to prefer narrow patents).

12. *See, e.g.,* Melissa F. Wasserman, *The Changing Guard of Patent Law:* Chevron *Deference for the PTO*, 54 WM. & MARY L. REV. 1959, 2016 (2013) (noting that the Federal Circuit's patent jurisprudence "has exhibited some symptoms that are consistent with bias" including a trend towards strengthening patents); Stuart Minor Benjamin & Arti K. Rai, *Fixing Innovation Policy: A Structural Perspective*, 77 GEO. WASH. L. REV. 1, 17 (2008) (describing how prior to the Supreme Court's intervention on Federal Circuit jurisprudence, "the Federal Circuit had made defending a patent against charges of invalidity significantly easier" and that the court's behavior "was arguably consistent with standard accounts of capture of regulatory processes by well-represented interest groups.").

13. *See infra* Section III.B.

14. The phrase "counter–majoritarian difficulty" was coined by Alexander Bickel to describe the problem of unelected judges using their power disregard the will of elected officials, therefore acting counter to "majority will." *See* ALEXANDER BICKEL, THE LEAST DANGEROUS BRANCH: THE SUPREME COURT AT THE BAR OF POLITICS 16–17 (2d ed. 1962) (arguing that "judicial review is a counter–majoritarian force in our system" and maintaining that when the Supreme Court declares a statute unconstitutional, it acts against "the prevailing majority"). Generally, standing ensures that the counter–majoritarian federal judiciary does not usurp "the policy-making functions of the popularly elected branches." William A. Fletcher, *The Structure of Standing*, 98 YALE L.J. 221, 222 (1988).

public.[15] Standing practices that filter third parties—who could bring patent challenges that regulated parties often will not—insulate bad patents and facilitate agency capture.[16] Without the safeguard of third party standing, the right to litigate against agencies would generally be limited to regulated parties whose interests may run counter to the interests of the general public.[17]

The 2011 Leahy–Smith America Invents Act (AIA) presents a potential solution to this problem. The AIA expanded the U.S. Patent and Trademark Office's (PTO's) ability to reexamine previously issued bad patents.[18] Congress added several provisions to the Patent Act to allow third parties to challenge patents in the Patent Trial and Appeal Board (PTAB).[19] Under the Patent Act's § 321 post–grant review (PGR), parties may challenge a patent within nine months of issuance.[20] PGR challenges may be made on the basis of failure to meet § 101 (eligible subject matter), § 102 (novelty and prior art), and § 103 (obviousness) challenges; third parties can additionally challenge patents under most of § 112's patentability requirements.[21] After the nine–month window expires, § 311 inter partes

15. Gregory Dolin has suggested that the historical push for addressing bad patents came from members of Congress, judges, and academics, as opposed to patent holders. Gregory Dolin, *Dubious Patent Reform*, 56 B.C. L. REV. 881, 891–92 (2015).

16. *See* Heather Elliott, *The Functions of Standing*, 61 STAN. L. REV. 459, 499–500 (2008) (arguing that "citizen suits allow citizens to ensure that agencies are not captive to regulated entities" and that as a remedy for capture, citizen suits "may serve a separation-of-powers interest arguably as valid as the anticonscription function."). For example, in environmental law, citizen–standing provisions allow third parties to challenge the Environmental Protection Agency's failure to enforce various environmental laws against transgressors. *See* Cassandra Stubbs, *Is the Environmental Citizen Suit Dead? An Examination of the Erosion of Standards of Justiciability for Environmental Citizen Suits*, 26 N.Y.U. REV. L. & SOC. CHANGE 77 (2001) (observing that Congress adopted the first environmental citizen–suit provision "against a backdrop of weak environmental laws, lax enforcement, and the popularity of agency capture theory.").

17. *See, e.g.*, Matthew T. Kirsch, *Upholding the Public Trust in State Constitutions*, 46 DUKE L.J. 1169, 1187 (1997) (explaining that standing has "traditionally been an obstacle to environmentally concerned plaintiffs seeking access to the courts" and that modern constitutional standing requirements are "often difficult for plaintiffs in environmental litigation to meet").

18. *See* Sarah Tran, *Patent Powers*, 25 HARV. J.L. & TECH. 595, 629 (2012) (describing how the AIA "gives the USPTO more tools (in the form of new proceedings) to weed out low-quality patents.").

19. *See infra* Part IV.B.

20. 35 U.S.C. § 321 (2011).

21. Section 321 states: "A petitioner in a post-grant review may request to cancel as unpatentable one or more claims of a patent on any ground that could be raised under paragraph (2) or (3) of section 282(b) (relating to invalidity of the patent or any claim)." *Id.* Section 282(b)(2) allows for challenges under § 101, 102, and 103, while § 282(b)(3)

review (IPR) allows challenges under §102 and § 103 based on published prior art or patents.[22] The new procedures for challenging issued patents have been wildly popular; the number of IPRs filed went from 514 in the 2013 fiscal year to 1310 in the 2014 fiscal year, and settled around 992 in the 2015 fiscal year.[23]

Notwithstanding the AIA's new procedures, questions remain regarding how to get third parties standing to challenge bad patents. Most scholars have focused on the Declaratory Judgment Act (DJA),[24] which allows, "in a case of actual controversy," for a court to "declare the rights and other legal relations of any interested party seeking such declaration."[25] However, as this Article will explain, the DJA is too limited to be an effective tool for fully protecting third–party rights, given that its focus is on protecting direct competitors.[26] Consequently, this Article focuses on standing under § 702 of the Administrative Procedure Act (APA), which creates a general cause of action for parties adversely affected by an agency decision.[27]

Part II of this Article considers impediments that prevent direct competitors from challenging bad patents, including the high cost of bringing challenges and the risk to the direct competitor's own patents. It further examines limitations on members of the public who want to challenge patents. Part III provides an overview of standing in the Federal

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allows for § 112 challenges excepting best mode. However, there is some disagreement over whether challenges should be permitted under § 101. *See, e.g.*, David Hricik, *Are the Courts Correct in their Assumption that a Patent Issued on Non-Patentable Subject Matter is Invalid?*, PATENTLY-O (Aug. 27, 2012), http://patentlyo.com/patent/2012/08/are-the-courts-correct-in-their-assumption-that-a-patent-issued-on-non-patentable-subject-matter-is-invalid.html (arguing that § 101 is not one of the "conditions of patentability," and is therefore excluded from § 282(b)(2)).

22. 35 U.S.C. § 311 (2015).

23. U.S. PATENT & TRADEMARK OFFICE, PATENT TRIAL AND APPEAL BOARD STATISTICS 4 (2015), http://www.uspto.gov/sites/default/files/documents/2015-04-30%20PTAB.pdf. Some parties have used IPRs for more malicious purposes, such as when billionaire Karl Bass filed IPRs to manipulate stock prices. *See* Jennifer Robichaux, Comment, *Hedge Funds Should Be Able to Challenge Patent Validity Using Inter Partes Review Despite Mixed Motives*, 54 HOUS. L. REV. 1315, 1317 (2017) (discussing Bass's use of IPRs to impact stock prices).

24. *See generally* Gaia Bernstein, *The End User's Predicament: User Standing in Patent Litigation*, 96 B.U. L. REV. 1929 (2016); Amelia S. Rinehart, *Patent Cases and Public Controversies*, 89 NOTRE DAME L. REV. 361 (2013); Megan M. La Belle, *Patent Law as Public Law*, 20 GEO. MASON L. REV. 41, 44 (2012).

25. MedImmune, Inc. v. Genentech, Inc., 549 U.S. 118, 126 (2007) (quoting 28 U.S.C. § 2201(a) (2006)).

26. *See infra* Section III.B.2.

27. *See* 5 U.S.C. § 702 (2012).

Circuit, and examines problems with regard to establishing constitutional standing and meeting the Federal Circuit's zone of interests test.

Part IV discusses the expansion of third–party rights under the AIA. It maintains that the statutory text and legislative history of the AIA both confirm that Congress intended for members of the public to be able to challenge bad patents. It further observes that third parties are now within the zone of interests because Congress intended the public to be beneficiaries under the Patent Act. Part V suggests potential changes that can be made to further expand standing. Specifically, Part V proposes that Congress create constitutional standing for third parties to bring challenges in the PTAB by adding a qui tam provision to the AIA. It argues that Congress could alternatively improve current PTAB procedures by adding an internal level of appeal for adverse decisions from administrative patent judges. Part VI concludes.

## II. OBSTACLES TO CHALLENGING BAD PATENTS

In an ideal world, if the PTO issued a bad patent, someone would seek to invalidate it—either through litigation or an administrative proceeding. But in practice, many bad patents remain unchallenged,[28] leading to vast social costs.[29] This Part considers non–legal impediments that can prevent such challenges, and discusses the resulting public impact. Section A considers why direct competitors do not challenge bad patents, including the high cost of bringing challenges, the risk of harming one's own patents, and the risk of retaliation. Section B examines how bad patents harm the public.

28. *See, e.g.*, Jay P. Kesan & Andres A. Gallo, *Why "Bad" Patents Survive in the Market and How Should We Change?—The Private and Social Costs of Patents*, 55 EMORY L.J. 61 (2006); Joseph Scott Miller, *Building a Better Bounty: Litigation-Stage Rewards for Defeating Patents*, 19 BERKELEY TECH. L.J. 667, 688–89 (2004) (arguing that challenges to bad patents are an undersupplied public good); *see also* Gaia Bernstein, *The Rise of the End User in Patent Litigation*, 55 B.C. L. REV. 1443, 1444–45 (2014) (discussing the growing role of end users in challenging bad patents).

29. *See* Miller, *supra* note 28, at 690 (discussing the social costs of bad patents); *see also* Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495, 1497, 1515–19 (2001) (arguing that bad patents have deterrent effects, create licensing hold–up issues, and facilitate antitrust collusion).

## A. OBSTACLES FOR DIRECT COMPETITOR PATENT CHALLENGES

### *1. Cost of Challenging Bad Patents*

Patent litigation is extremely expensive.[30] The American Intellectual Property Law Association's 2015 Report of the Economic Survey revealed that while the median litigation cost decreased slightly in 2015, it is still $600,000 for less than $1 million at risk.[31] For $1 to $10 million at risk, that amount rises to $950,000; for $10 to $25 million at risk, the cost is $1.9 million.[32] The high litigation costs create opportunities for holders of bad patents. Non–practicing entities or "patent trolls" flourish, in part, because it is cheaper for a business to pay for a patent license than it is to challenge the patent.[33] Likewise, even practicing entities can take the form of "patent bullies," asserting bad patents against entities that cannot afford to litigate.[34]

IPRs may be less expensive than litigation, but are nevertheless still costly. The filing fee alone for an IPR is $23,000 and, with attorney fees, the median cost to bring an IPR rises to $275,000 through a PTAB hearing or to $350,000 through an appeal to the Federal Circuit.[35] Consequently,

30. Joseph Farrell & Robert P. Merges, *Incentives to Challenge and Defend Patents: Why Litigation Won't Reliably Fix Patent Office Errors and Why Administrative Patent Review Might Help*, 19 BERKELEY TECH. L.J. 943, 949 (2004) (discussing the cost of patent litigation).

31. AM. INTELLECTUAL PROP. LAW ASS'N, REPORT OF THE ECONOMIC SURVEY 37 (2015) [hereinafter AIPLA 2015 REPORT]. The figure represents the median litigation cost for patent infringement suits, inclusive of all costs. *Id.* In 2013, the same figure was even higher—$700,000. *Id.*

32. *Id.*

33. *See* Ted Sichelman, *Commercializing Patents*, 62 STAN. L. REV. 341, 368 (2010) (observing that non–practicing entities are pejoratively referred to as "trolls" because they "tend to exploit litigation and licensing market defects to extract unwarranted rents from commercializers, usually on patents that the commercializer was completely unaware of before the NPE's demand for payment."); *see also* Mark A. Lemley & A. Douglas Melamed, *Missing the Forest for the Trolls*, 113 COLUM. L. REV. 2117, 2153 (2013) (noting that some non–practicing entities aggregate patents in an area of technology, forcing parties to pay for a license to the bundle even if they think individual patents are invalid); Colleen V. Chien, *Software Patents as a Currency, Not Tax, On Innovation*, 31 BERKELEY TECH. L.J. (forthcoming 2017) (describing potential advantages and drawbacks of non–practicing entity suits in context of software patents).

34. Ted Sichelman, *The Vonage Trilogy: A Case Study in "Patent Bullying"*, 90 NOTRE DAME L. REV. 543, 549–50 (2014) ("[P]atent bullies' take full advantage of weak, uncertain, and vague patents; the high costs of litigation; the ability to delay lawsuits; and their massive resources in order to engage in highly anticompetitive behavior, often against market entrants and startups."); Colleen V. Chien, *Of Trolls, Davids, Goliaths, and Kings: Narratives and Evidence in the Litigation of High-Tech Patents*, 87 N.C. L. REV. 1571 (2009) (describing such litigators as "Goliaths").

35. *See* AIPLA 2015 REPORT, *supra* note 31, at 38.

small businesses and startups may find it cheaper to pay for a license than to challenge the patent in the PTAB.[36] For example, Personal Audio LLC—a patent holding company—targeted several small podcasters and threatened to sue if a license was not purchased.[37] Recognizing that small businesses could not afford to challenge Personal Audio's patent, the Electronic Freedom Foundation (EFF) crowdsourced money to file an IPR, and successfully invalidated critical claims.[38]

There are ways that the problem of cost could be addressed. First, PTAB proceedings could be significantly cheaper. In the European Patent Office ("EPO"), for example, an opposition proceeding can be filed against a European patent for around $1,000.[39] Second, fee shifting could be used to defray the cost of litigation and encourage more injured parties to challenge bad patents.[40]

*2. Fear of Invalidation of One's Own Patents*

Another major obstacle to competitors challenging bad patents is a fear of harming its own patent portfolio, especially for § 101 challenges. If a challenger succeeds in convincing the court that its competitor's patents are not patentable subject matter, the challenger may undermine the validity of

36. The majority of defendants in cases brought by patent trolls are companies with less than $10 million in annual revenue. Colleen Chien, *Startups and Patent Trolls*, 17 STAN. TECH. L. REV. 461, 464 (2014) (observing that at least fifty–five percent of unique defendants in patent troll suits have annual revenue of $10 million or less).

37. *See* Letter from Personal Audio LLC to anonymized recipient (Apr. 23, 2013), https://trollingeffects.org/demand/personal-audio-2013-04-23-0 (demanding royalties for Personal Audio LLC's patent).

38. *Podcast 'Patent Troll' Faces Blow After US Ruling*, BBC NEWS (Apr. 13, 2015), http://www.bbc.com/news/technology-32286340. The EFF cited the high cost of IPRs as a reason why nonprofit organizations need the ability to challenge bad patents, given that the cost is prohibitive for many small businesses. Vera Ranieri, *Congress: Stop Trying to Limit EFF's Ability to Challenge Patents*, ELEC. FRONTIER FOUND. (Apr. 23, 2015), https://www.eff.org/deeplinks/2015/04/congress-stop-trying-limit-effs-ability-challenge-patents ("Patents that have been wrongly granted hurt the public, and the public should have a right to challenge them.").

39. Hazel Ford & Leythem A. Wall, *A Trump Card for Challengers*, LIFE SCI. INTELL. PROP. REVIEW (April 30, 2015), http://www.finnegan.com/resources/articles/articlesdetail.aspx?news=119a5f40-981d-43c2-b62c-1a89d6ad8142 (noting that the EPO charges a flat fee of $842 to file an opposition). However, EPO oppositions do not allow for discovery. *Id.*

40. *See* Bernstein, *supra* note 28, at 1489–93 (arguing that fee shifting could be used to encourage end users to challenge bad patents); Jay P. Kesan, *Carrots and Sticks to Create a Better Patent System*, 17 BERKELEY TECH. L.J. 763, 795 (2002) ("[O]ne-way, pro-defendant, fee-shifting in a narrow set of circumstances can be an effective disincentive by increasing the cost to patentees of engaging in certain kinds of opportunistic conduct.").

its own patents.[41] As Professor Rochelle Dreyfuss has noted, "because standing in court largely limits the class of potential challengers to entities within the same industrial sector as the patent holder, no one raises questions that call the entire industry's holdings into question."[42]

Relatedly, Dreyfuss notes that by the time a group finally manages to bring such a challenge, the court is reluctant to disrupt settled expectations.[43] For example, consider the litigation regarding Myriad Genetics' patents on isolated BRCA 1 and BRCA 2 ("the *Myriad* litigation"). In a concurrence, Judge Moore on the Federal Circuit stated that if she were "deciding this case on a blank canvas," she "might conclude that an isolated DNA sequence that includes most or all of a gene is not patentable subject matter."[44] Judge Moore noted that the PTO "has allowed patents on isolated DNA sequences for decades," and observed that "[t]here are now thousands of patents with claims to isolated DNA" and a large number of patents that claim "purified natural products or fragments thereof."[45] She concluded that courts must be "particularly wary of expanding the judicial exception to patentable subject matter where both settled expectations and extensive property rights are involved."[46]

To the extent that other judges are reluctant to disrupt settled patentability expectations, Dreyfuss's concern is a significant one. As discussed above, patent challenges are extremely expensive. After a bad patent issues, a public interest group may need to wait to make sure that the patent poses a real risk to the public welfare, and would then need to find the funds to cover the high cost of litigation and find suitable plaintiffs who could survive a standing challenge. By the time such a case made it to the Federal Circuit, expectations may be settled, making it that much harder to get the patent (or class of patents) invalidated.

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41. *See* Eileen M. Kane, *Splitting the Gene: DNA Patents and the Genetic Code*, 71 TENN. L. REV. 707, 726 (2004) ("[P]atent litigation also often involves similarly situated competitors, neither of which may be interested in raising an issue with implications beyond the patent in suit."); La Belle, *supra* note 24, at 65 ("[T]he parties usually best positioned to contest bad patents—competitors—often are loath to initiate challenges because of concerns about putting their own intellectual property at risk.").

42. Rochelle Cooper Dreyfuss, *Giving the Federal Circuit a Run for Its Money: Challenging Patents in the PTAB*, 91 NOTRE DAME L. REV. 235, 292 (2015).

43. *Id.*

44. Ass'n for Molecular Pathology v. U.S. Patent & Trademark Office, 689 F.3d 1303, 1343 (Fed. Cir. 2012) (Moore, J., concurring), *rev'd in part sub nom.* Ass'n for Molecular Pathology v. Myriad Genetics, Inc., 133 S. Ct. 2107 (2013).

45. *Id.*

46. *Id.*

*3. Retaliation*

Some competitors fear that if they challenge a bad patent, the patent holder will retaliate. Many parties will infringe a patent and hope that the patent holder does not notice, especially academics researching in life sciences.[47] Challenging a bad patent can bring unwanted scrutiny, especially for small competitors. A competitor who files a declaratory judgment action may find itself faced with a countersuit for patent infringement.[48]

A competitor cannot stay anonymous if it files an IPR or a district court proceeding.[49] This poses several problems. Commentators have noted that small companies may want to challenge a large competitor's patents without the fear of retaliation.[50] Although anonymous challenges are available for ex parte reexamination,[51] such challenges are limited to prior art from printed publications and patents, as well as statements from the patent owner in judicial or PTO proceedings.[52]

Contrast PTAB proceedings with opposition proceedings in the EPO. Like post–grant review, a European opposition proceeding must be brought within nine months of a patent's issuance. However, a "straw man provision" allows challengers to remain anonymous in the EPO and name

47. *See* Sapna Kumar & Arti Rai, *Synthetic Biology: The Intellectual Property Puzzle*, 85 TEX. L. REV. 1745, 1757 (2007) (noting that in the biopharmaceutical industry, "firms may be able to circumvent anticommons difficulties through secret infringement that does not come to light (if at all) until after the six-year statute of limitations has run"); John P. Walsh et al., *View from the Bench: Patents and Material Transfers*, 309 SCIENCE 2002 (2005) (finding that academic researchers frequently ignore patents).

48. *See* La Belle, *supra* note 24, at 65.

49. *See* Saurabh Vishnubhakat et al., *Strategic Decision Making in Dual PTAB and District Court Proceedings*, 31 BERKELEY TECH. L.J. 45, 59 n.67 (2016) (observing that IPRs cannot be filed anonymously due to constraints under 35 U.S.C. § 315(a) and (b)).

50. *See* Mark D. Janis, Inter Partes *Patent Reexamination*, 10 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 481, 489 n.32 (2000) ("One can imagine, for example, a small company that fears an infringement suit from a large patent owner, and would like to test the patent in a relatively inexpensive reexamination forum without attracting attention to the possible infringement."); Kristen J. Osenga, *Rethinking Reexamination Reform: Is It Time for Corrective Surgery, Or Is It Time to Amputate?*, 14 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 217, 236 (2003) ("[T]he requirement that a real party in interest must be identified for inter partes reexamination is a disincentive for smaller parties to utilize this mechanism.").

51. 35 U.S.C. § 301(e) (2012) ("Upon the written request of the person citing prior art or written statements pursuant to subsection (a), that person's identity shall be excluded from the patent file and kept confidential."); 37 C.F.R. § 1.501(d) (2016).

52. 35 U.S.C. § 301(a) (2012).

only their attorney or another third party.[53] The anonymous party then becomes a party to the proceeding, allowing it to participate in oral proceedings.[54] Such straw man proceedings are permitted so long as the real party of interest does not attempt to circumvent the law by abuse of due process.[55]

*4. Time Constraints and Limitations for Inter Partes Review*

Time constrains for PGRs limit competitor challenges to bad patents. PGRs can only be filed within nine months of a patent's issuance, which can make them difficult to use. A newer competitor may not have been in business when the PGR window closed or may not have been developing products in the same line of technology. Even an established competitor would have to make educated guesses as to which issued patents would pose a threat years down the line, as costs would limit the number of challenges it can bring.

After the PGR period ends, parties can still seek cancellation of patent claims using IPR.[56] But unlike PGR challenges, which can be brought on a wide variety of grounds, IPRs are considerably more limited. The request for cancellation for in an IPR must be "on a ground that could be raised under § 102 or § 103 and only on the basis of prior art consisting of patents or printed publications."[57] Consequently, for a challenge being brought more than nine months after issues that is based on § 101 or § 112, expensive litigation in federal court remains a competitor's only option.

53. *See* Filip De Corte et al., *AIA Post-Grant Review & European Oppositions: Will They Work in Tandem, or Rather Pass Like Ships in the Night?*, 14 N.C. J.L. & TECH. 93, 101 (2012) (discussing anonymous oppositions); *see also* G 0003/97 *INDUPACK AG/ Hartdegen Emmerich Ing.* O.J. EPO 245 (1999) (holding that the use of straw man in EPO oppositions is permissible and observing that the "formally authorised [sic] opponent is treated as a party"), http://www.epo.org/law-practice/case-law-appeals/recent/g970003ep1.html.

54. *Id.*

55. Abuse of due process occurs if the real party of interest is the patent holder or if "the opponent is acting on behalf of a client in the context of activities which, taken as a whole, are typically associated with professional representative" without possessing requisite qualifications. G 0004/97 *Genentech*, O.J. EPO 270 (1999), https://www.epo.org/law-practice/case-law-appeals/recent/g970004ex1.html.

56. 35 U.S.C. § 311 (2012).

57. 35 U.S.C. § 311(b).

*5. Free–Rider Problem*

Challenges to bad patents also suffer from a free–rider problem.[58] To challenge a patent, a competitor must bear the high cost of litigation and take the risk that the court will disagree. But if the competitor succeeds, then the invalidated patent becomes a public good that other competitors, who bore neither cost nor risk, will benefit from.[59] Consequently, competitors have an incentive to save resources by waiting for someone else to deal with the problematic patent.

Scholars have proposed a number of solutions to this problem. If plaintiffs who successfully invalidated patent claims in the PTAB or in court were financially rewarded with a "patent bounty," this would increase the incentive for competitors and non–competitors alike to bring such challenges. Several scholars have suggested ways for financing the bounty, such as requiring the patent holder to pay it.[60] However, these ideas have not gained any traction in Congress.

*6. Conclusions*

Examining the problems above, it becomes clear that many of the obstacles to challenging bad patents could be lessened with changes to the Patent Act. Fees for IPRs and PGRs could be reduced and the PTO could allow for anonymous complaints. Bounties for bad patents could be paid to those who successfully challenge a bad patent, and more aggressive fee

58. *See* Michael J. Burstein, *Rethinking Standing in Patent Challenges*, 83 GEO. WASH. L. REV. 498, 543–44 (2015) ("Because the costs of challenging patents are borne singly but the benefits are spread globally, parties who might be interested in such challenges have an incentive to free ride on the efforts of others"); Dreyfuss, *supra* note 42, at 237 (arguing that "there is a collective action problem" with challenging patents through litigation, because "every would-be challenger has an incentive to sit back and wait for a competitor to do the heavy lifting."); Farrell & Merges, *supra* note 30, at 952 (discussing the free–rider problem).

59. Megan M. La Belle, *Against Settlement of (Some) Patent Cases*, 67 VAND. L. REV. 375, 399 (2014) (arguing that an alleged infringer may choose to settle rather than seek invalidation of the patent holder's patent to prevent competitors from benefitting).

60. For example, Anup Malani and Jonathan Masur suggest that a person whose patent is invalidated in litigation should have to pay a penalty to the successful challenger. Anup Malani & Jonathan S. Masur, *Raising the Stakes in Patent Cases*, 101 GEO. L.J. 637, 672–73 (2013). Under their proposal, patent holders who are successful would also get a stronger reward, either heightened damages or an extension of their patent term. *Id.* at 658. John Thomas proposes a bounty being paid out prior to issuance when a third party supplies information that causes a patent claim to be rejected by the PTO. John R. Thomas, *Collusion and Collective Action in the Patent System: A Proposal for Patent Bounties*, 2001 U. ILL. L. REV. 305, 342 (2001).

shifting could be implemented, thus lessening both the free–rider effect and the financial burden of litigation.

However, patent holders have good reasons not to push for such changes. Amending the Patent Act to facilitate patent challenges will present some risk to all patent holders, given changes to the statute will increase uncertainty.[61] A risk–averse party might prefer having its competitors' bad patents left in place rather than risk statutory changes. For this reason, addressing the problem of public participation may be the best way to confront the bad patent problem.

### B. IMPACT ON THE PUBLIC

The Constitution sets out a public mission for the patent system: "to promote the Progress of Science and useful Arts."[62] Yet for many years, patent rights were treated as purely private rights affecting only the patent holder and its direct competitors.[63] However, this view has come under increasing scrutiny. Commentators have observed that the private law characterization of patents has led to skewed standing jurisprudence under the DJA[64] and has impacted how courts award remedies.[65]

The idea that bad patents harm more than just direct competitors has been gaining traction. The EFF has started a Patent Busting Project that crowd–sources money to file IPRs.[66] Although the EFF's efforts, in part,

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61. Several scholars have observed various ways in which the AIA has created uncertainty. *See, e.g.*, Mark A. Lemley, *Does "Public Use" Mean the Same Thing It Did Last Year?*, 93 TEX. L. REV. 1119, 1123–24 (2015) (discussing ambiguity in the AIA with regard to what constitutes "public use"); Gregory Dolin, *Dubious Patent Reform*, 56 B.C. L. REV. 881, 922, 924–25 (2015) (discussing how post–issuance review mechanisms under the AIA raise uncertainty for patent holders).

62. U.S. CONST. art. I, § 8, cl. 8; *see also* John M. Golden, *Patent Privateers: Private Enforcement's Historical Survivors*, 26 HARV. J.L. & TECH. 545, 547 (2013) ("U.S. patent law is federal statutory law designed to advance a constitutionally sanctioned public policy.").

63. Both the Supreme Court and the Federal Circuit have noted that patent infringement is a tort intended to make a private party whole. *See, e.g.*, Carbice Corp. of Am. v. Am. Patents Dev. Corp., 283 U.S. 27, 33 (1930) ("Infringement, whether direct or contributory, is essentially a tort, and implies invasion of some right of the patentee."); *In re* Cambridge Biotech Corp., 186 F.3d 1356, 1358, 1371 (Fed. Cir. 1999) ("[P]atent infringement is properly classified as a tort, albeit one created by federal statute.").

64. *See* La Belle, *supra* note 24, at 96–98 (2012).

65. *See* Ted Sichelman, *Purging Patent Law of "Private Law" Remedies*, 92 TEX. L. REV. 517, 529, 567 (2014) (arguing that the private law view of patent damages disregards the "overriding goal" of promoting innovation, and proposing a more discretionary approach).

66. *Patent Busting Project*, ELEC. FRONTIER FOUND., https://www.eff.org/patent-busting (last visited Aug. 13, 2017); *EFF Files Challenge with Patent Office Against*

are to protect small entities that are vulnerable to patent trolls, the organization is also concerned about patent owners hindering free expression by enforcing bad patents on means of online communication, like podcasting.[67]

The Federal Circuit has recognized that the issuance of patents is a public concern.[68] For example, in *MCM Portfolio LLC v. Hewlett–Packard Co.*, MCM challenged the constitutionality of the PTAB. The court held that IPRs do not violate Article III of the Constitution and held that the PTO has the right to correct its mistakes by cancelling erroneously granted claims.[69] Nevertheless, the Federal Circuit severely limits standing and downplays the harm that bad patents cause to the general public.[70]

*1. Higher Costs for Goods and Services*

When patents are erroneously granted, the public pays higher prices. The patent holder or an exclusive licensee can use supracompetitive pricing if no comparable product exists.[71] Manufacturers wishing to sell products that fall within the bad patent's scope may have to pay for an unnecessary license or engage in costly design–around activities; extra costs are then passed on to the consumer.[72] Indeed, Congress has recognized the impact of bad patents on the cost of pharmaceuticals and, under the Hatch–Waxman Act, has granted a 180–day period of exclusivity to the generic drug manufacturer that first files an Abbreviated New Drug Application challenging a drug patent.[73]

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*Troll's Podcasting Patent*, ELEC. FRONTIER FOUND. (Oct. 16, 2013), https://www.eff.org/press/releases/eff-files-challenge-patent-office-against-trolls-podcasting-patent.

67. *Id.*

68. *See* Patlex Corp. v. Mossinghoff, 758 F.2d 594, 604 (Fed. Cir. 1985) (observing that "the grant of a valid patent is primarily a public concern" and finding that "the threshold question usually is whether the PTO, under the authority assigned to it by Congress, properly granted the patent").

69. 812 F.3d 1284, 1291 (Fed. Cir. 2015).

70. *See infra* Section III.B.

71. Kesan, *supra* note 40, at 767. Likewise, as Judge Richard Posner notes, excessive patent protection leads to excessive market prices and other problems associated with bad patents. *See* Richard Posner, *Do Patent and Copyright Law Restrict Competition and Creativity Excessively?*, BECKER-POSNER BLOG (Sept. 30, 2012), http://www.becker-posner-blog.com/2012/09/do-patent-and-copyright-law-restrict-competition-and-creativity-excessively-posner.html.

72. *See* Shubha Ghosh & Jay Kesan, *What Do Patents Purchase? In Search of Optimal Ignorance in the Patent Office*, 40 HOUS. L. REV. 1219, 1227–28 (2004) (explaining that the cost of bad patents includes unnecessary licensing costs and wasteful design–around activities).

73. *See* Glynn S. Lunney, Jr., FTC v. Actavis*: The Patent-Antitrust Intersection Revisited*, 93 N.C. L. REV. 375, 386–89 (2015) ("That Congress provided such a special

Paying higher prices, however, is not a basis for standing in the Federal Circuit. In the *Myriad* litigation, a diverse group of plaintiffs challenged Myriad's isolated gene patents using the DJA.[74] Several of the plaintiffs complained about the high cost of BRCA 1 and 2 testing.[75] Indeed, soon after the Supreme Court struck down Myriad's patents, the cost of testing was halved.[76]

However, in striking standing for all but one of the plaintiffs, the Federal Circuit emphasized the narrowness of the doctrine. The court noted that "a case or controversy must be based on a *real* and *immediate* injury or threat of future injury that is *caused by the defendants*," and narrowly construed "injury" to be a threat of suit or demand of royalty payments.[77] It further held that "a declaratory judgment plaintiff must allege both (1) an affirmative act by the patentee related to the enforcement of his patent rights, and (2) meaningful preparation to conduct potentially infringing activity."[78] Merely paying higher prices is therefore insufficient.

*2. Lack of Access to Goods and Services*

The public is harmed when bad patents block access to goods and services.[79] For example, DNA Sciences was the exclusive licensee of a patent on the isolated, purified gene that causes Long QT Syndrome, a condition that can cause sudden death.[80] DNA Sciences sued competitor GeneDx, and was successful in shutting down its testing program.

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incentive to encourage challenges to pharmaceutical patents, and not patents generally, suggests that pharmaceutical patents, particularly weak pharmaceutical patents, impose uniquely high costs on society.").

74. Ass'n for Molecular Pathology v. U.S. Patent & Trademark Office, 669 F. Supp. 2d 365 (S.D.N.Y. 2009), *rev'd*, 689 F.3d 1303 (2012), *rev'd on other grounds sub nom.* Ass'n for Molecular Pathology v. Myriad Genetics, Inc., 133 S. Ct. 2107 (2013).

75. *Id.* at 374–75.

76. *See* Sy Mukherjee, *The Supreme Court's Gene Patent Ruling Is Already Leading to Cheaper Cancer Tests*, THINKPROGRESS (June 14, 2013, 2:35 PM), https://thinkprogress.org/the-supreme-courts-gene-patent-ruling-is-already-leading-to-cheaper-cancer-tests-b5ff1d4b09a9/ (noting that Ambry's most detailed BRCA testing cost $2,200—nearly half the cost of Myriad's comprehensive test).

77. Ass'n for Molecular Pathology v. U.S. Patent & Trademark Office, 689 F.3d 1303, 1319–20 (internal quotation marks omitted).

78. *Id.* at 1318 (citations omitted).

79. *See, e.g.*, Sapna Kumar, *Life, Liberty, and the Pursuit of Genetic Information*, 65 ALA. L. REV. 625, 661–63 (2014) (discussing how diagnostic patents can harm third parties when a patent holder does not offer the test that it has a monopoly over).

80. *See* Misha Angrist et al., *Impact of Gene Patents and Licensing Practices on Access to Genetic Testing for Long QT Syndrome*, 12 GENETICS MED. S111 (2010). Isolated DNA is now considered to be unpatentable under § 101 of the Patent Act. *Myriad Genetics*, 133 S. Ct. at 2120.

Consequently, no LQTS testing was offered for a period of 18 months,[81] possibly causing one death.[82]

In theory, the public should never lose access to life–saving tests and treatments. In *eBay v. MercExchange*, the Supreme Court held that a patent holder seeking a permanent injunction must satisfy a four–factor test, which includes demonstrating "that the public interest would not be disserved by a permanent injunction."[83] Injunctions are therefore unlikely to be granted for patents on tests or treatments that are only being offered by the infringer.

There are problems, however, that *eBay* could not address. Often a company seeking to offer goods or services covered by a patent does not want to risk litigation and will cease potentially infringing activity upon receipt of a cease–and–desist letter.[84] Moreover, the *eBay* decision does not apply to the International Trade Commission (ITC), which has the power to exclude goods that infringe patents at the U.S. border.[85] Although the ITC is supposed to take into account the public interest before issuing an exclusion order, it has not denied an exclusion order on such grounds since 1984.[86] Consequently, in practice, patents do hinder public access to life–saving technologies.

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81. *See* Angrist et al., *supra* note 80, at S120.

82. In a statement before the PTO, Marc Grodman attributed the death of a ten–year old girl to the lack of available LQTS testing. *Stifling or Stimulating—The Role of Gene Patents in Research and Genetic Testing: Hearing Before the Subcomm. on Courts, the Internet, and Intellectual Prop. of the H. Comm. on the Judiciary*, 110th Cong. 35 (2007) (statement of Marc Grodman, CEO, Bio–Reference Labs).

83. 547 U.S. 388, 391 (2006).

84. An example of this was seen in the *Myriad* litigation. The Yale University's DNA Diagnostics Laboratory developed large rearrangement testing for a genetic mutation that causes breast cancer. Yale's test was able to find women at high risk for breast cancer that Myriad's test missed. Yale sought permission to offer the test, but Myriad refused and threatened to sue, causing Yale to stop offering the test and leaving the public without an equivalent test for one year. Supplemental Declaration of Ellen T. Matloff at ¶ 8, Ass'n for Molecular Pathology v. U.S. Patent & Trademark Office, 702 F. Supp. 2d 181 (S.D.N.Y. 2010) (No. 09-cv-04515), 2010 WL 10107606. Yale also received a cease–and–desist letter for their other BRCA 1 and 2 testing. Carole Bass, *Can Genes Be Intellectual Property?*, YALE ALUM. MAG. (May/June 2013), https://yalealumnimagazine.com/articles/3678/can-genes-be-intellectual-property.

85. *See* Spansion, Inc. v. U.S. Int'l Trade Comm'n, 629 F.3d 1331, 1369 (Fed. Cir. 2010) (holding that *eBay* does not apply to the ITC because of the "different statutory underpinnings for relief" under § 337 of the Tariff Act).

86. *See* Sapna Kumar, *The Other Patent Agency: Congressional Regulation of the ITC*, 61 FLA. L. REV. 529, 567 (2009) (discussing the three cases in which the ITC denied an exclusion order on public policy grounds).

*3. Impeded Downstream Research*

The public is also harmed when bad patents impede downstream research.[87] Competitors may abandon promising research when lacking the funds to challenge a problematic patent.[88] This issue is especially pronounced in biomedical research, given the risk of a tragedy of the anticommons arising from fractured patent rights.[89] In *Madey v. Duke*, the Federal Circuit gutted the experimental use exception, holding that if an "act is in furtherance of the alleged infringer's legitimate business" and not "solely for amusement, to satisfy idle curiosity, or for strictly philosophical inquiry," then the act does not qualify for the experimental use defense.[90] Because the Patent Act lacks an exception for downstream research, nonprofit research institutions can be hindered.[91]

## III. STANDING LIMITATIONS TO ORIGINAL FEDERAL COURT ACTIONS

Members of the public can potentially play an important role in challenging bad patents in federal court. Unlike direct competitors, they do not have patents that could be invalidated as a result of their action and therefore face little risk of retaliation. Although non–competitors may not

87. *See* Robert P. Merges, *As Many as Six Impossible Patents Before Breakfast: Property Rights for Business Concepts and Patent System Reform*, 14 BERKLEY TECH. L.J. 577, 592 (1999) (discussing the cost of invalid patents, including "foregone research opportunities, abandoned or avoided by the patentee's competitors who fear infringement liability . . . .").

88. *See* Kesan, *supra* note 40, at 767 (explaining that one of the costs of bad patents is "the social cost of abandoned research activities by the patentee's competitors who may fear infringement.").

89. *See* Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research,* 280 SCIENCE 698, 698 (1998) (observing that privatization of upstream biomedical research, in the form of patents and other intellectual property, may create anticommons property that can be "economically and socially costly"); Arti K. Rai & Rebecca S. Eisenberg, *Bayh-Dole Reform and the Progress of BioMedicine*, 66 LAW & CONTEMP. PROBS. 289, 297–98 (2003) (noting that anticommons concerns from patents are "quite pressing in contemporary biomedical research that draws upon many prior discoveries made by different scientists in universities and private firms").

90. Madey v. Duke Univ., 307 F.3d 1351, 1362 (Fed. Cir. 2002); *see also* Katherine J. Strandburg, *What Does the Public Get? Experimental Use and the Patent Bargain*, 2004 WIS. L. REV. 81, 87 (2004) ("[T]he experimental-use exemption has been reduced to a mere *de minimis* exception that bears little relation to the implications of a particular experimental use for the public benefits of follow-on innovation.").

91. For example, in the *Myriad* litigation, one of the original plaintiffs argued that she had the capability to offer genetic testing that was more comprehensive than what Myriad offered, but she could not due to Myriad's patents. Ass'n for Molecular Pathology v. U.S. Patent & Trademark Office, 669 F. Supp. 2d 365, 372 (S.D.N.Y. 2009).

have the resources that a large competitor has, they can crowdsource public knowledge of prior art to challenge bad patents[92] and can pool resources to cover the costs of litigation.[93]

Standing, however, remains a significant obstacle. To challenge a patent in federal court, a plaintiff must establish standing under either the DJA or § 702 of the APA.[94] A series of Federal Circuit decisions has made this quite difficult by narrowing the category of who can be considered a direct competitor. Moreover, public interest groups that challenge patents in the PTAB may lack constitutional standing, thus preventing them from appealing adverse decisions to the Federal Circuit. Section A provides an overview of the standing doctrine and discusses both constitutional standing and the zone of interests test. Section B then discusses how the Federal Circuit has made it difficult for members of the public to establish standing in patent cases.

## A. INTRODUCTION TO STANDING

The Supreme Court has described standing as being "an essential and unchanging part of the case-or-controversy requirement of Article III."[95] To

92. AskPatents.com allows users to crowd–source prior art for bad patents. It was inspired by the Peer to Patent trial in the PTO. Joel Spolsky, *AskPatents.com: A Stack Exchange to Prevent Bad Patents*, STACK OVERFLOW (Sept. 20, 2012), http://blog.stackoverflow.com/2012/09/askpatents-com-a-stack-exchange-to-prevent-bad-patents/. EFF has also relied on crowd–sourcing information to bring IPRs. *See* Julie Samuels, *EFF's Fight for Open 3D Printing Continues at Ask Patents*, ELEC. FRONTIER FOUND. (March 18, 2013), https://www.eff.org/deeplinks/2013/03/effs-fight-open-3d-printing-continues-askpatentscom.

93. For example, United Patents is a subscription–based service that uses fees from company members to monitor patent trolls, file IPRs, and even purchase patents before trolls can. MARTA BELCHER & JOHN CASEY, HACKING THE PATENT SYSTEM: A GUIDE TO ALTERNATIVE PATENT LICENSING FOR INNOVATORS 4 (2014), https://www.eff.org/files/2014/05/29/hacking_the_patent_system.pdf. End users of products and services can also serve a similar role. *See, e.g.*, Organic Seed Growers & Trade Ass'n v. Monsanto Co., 718 F.3d 1350, 1353–54 (Fed. Cir. 2013) (involving a group of farmers seeking declaratory judgments of noninfringement and invalidity of twenty–three patents owned by Monsanto); *see also* Bernstein, *supra* note 28, at 1445 (discussing the role that end users play in challenging patents); Ellen Matloff, *A Genetic Counselor Explains How Gene Patents Harmed Her Patients*, BREAST CANCER ACTION (June 27, 2013), http://www.bcaction.org/2013/06/27/a-genetic-counselor-explains-how-gene-patents-harmed-her-patients/ (discussing how Yale genetic counselor Ellen Matloff's research was impacted by Myriad's BRCA 1 and 2 patents, leading her to become a plaintiff in the *Myriad* litigation).

94. *See infra* Section III.B.

95. Lujan v. Defenders of Wildlife, 504 U.S. 555, 560 (1992); *see also* U.S. CONST. art. III, § 2 ("The judicial Power shall extend to all Cases, in Law and Equity, arising under this Constitution, the Laws of the United States, and Treaties made . . . to Controversies between two or more States;—between a State and Citizens of another State;—between

bring a case, a plaintiff must "demonstrate a personal stake in the outcome in order to assure that concrete adverseness which sharpens the presentation of issues necessary for the proper resolution of constitutional questions."[96] The Court has further noted that "[a]bstract injury is not enough," and that a plaintiff must show that he or she "sustained or is immediately in danger of sustaining some direct injury" from the challenged conduct.[97]

Notwithstanding the Supreme Court's insistence of standing's constitutional roots, the doctrine dates back only to the 1930s,[98] with two developments playing a major role in its creation and evolution. The first development was the birth of the administrative state. As Professor Cass Sunstein has noted, during the New Deal, courts were viewed as lacking necessary expertise, flexibility, and accountability to tackle difficult social problems facing society.[99] Agencies, by contrast, were viewed as instruments for promoting public interest, making them the superior part of government to carry out the New Deal agenda.[100] When the APA was enacted 1946, § 702 stated that "[a] person suffering legal wrong because of agency action, or adversely affected or aggrieved by agency action within the meaning of a relevant statute, is entitled to judicial review thereof."[101] To protect agencies, sympathetic judges developed standing and other justiciability doctrines as a way of insulating agencies from outside challenges.[102]

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Citizens of different States;—between Citizens of the same State claiming Lands under Grants of different States, and between a State, or the Citizens thereof, and foreign States, Citizens or Subjects.").

96. City of Los Angeles v. Lyons, 461 U.S. 95, 101 (1983).

97. *Id.* at 101–02.

98. Fletcher, *supra* note 14, at 225.

99. Cass R. Sunstein, *Law and Administration After* Chevron, 90 COLUM. L. REV. 2071, 2079 (1990) ("[C]ourts lacked the flexibility, powers of coordination, initiative, democratic accountability, and expertise necessary to deal with complex social problems.").

100. *See id.* at 2080 (discussing the creation of new agencies to implement the New Deal); Thomas W. Merrill, *Capture Theory and the Courts: 1967–1983*, 72 CHI.-KENT L. REV. 1039, 1048 (1997) (noting that after the APA was implemented, "the dominant understanding of the administrative agencies was that they were instruments for promoting the public interest").

101. 5 U.S.C. § 702 (2012).

102. *See* Cass R. Sunstein, *Standing and the Privatization of Public Law*, 88 COLUM. L. REV. 1432, 1437–38 (1988) (explaining that pro–New Deal judges used justiciability doctrines to protect agencies from outside challenges); Maxwell L. Stearns, *Standing and Social Choice: Historical Evidence*, 144 U. PA. L. REV. 309, 366 (1995) ("[C]onstitutional historians have largely agreed that standing evolved to stave off unwelcome attacks by those harmed by regulatory programs that were designed to combat the Depression.").

The second development to impact standing was the recharacterization of certain areas of private law as public law.[103] The private law model views lawsuits as a mechanism reserved "for settling disputes between private parties about private rights."[104] Applied to standing, this approach limited court access to industries that were the direct targets of regulation. Competitors and the public who were affected by the regulation had no mechanism to challenge the court's action and had to resort to the political process.[105]

The public law model is considerably broader, viewing lawsuits as tools for the court to vindicate statutory or constitutional policies.[106] Beginning in the early 1970s, the Supreme Court began to embrace this more inclusive view of litigation with regard to public challenges to agency actions. In *Association of Data Processing Service Organizations v. Camp*, for example, the Supreme Court held that a party had standing so long as there was constitutional standing and the injury in fact was arguably within the zone of interests protected by the statute or constitutional provision at issue.[107] This current public law model permits courts to engage in policymaking in a limited scope, allows for greater third–party participation, and recognizes the court's ability to resolve disputes traditionally left to Congress or to agencies.[108]

*1. Standing Under the Administrative Procedure Act*

A party attempting to challenge an agency action under the APA must first show that it has constitutional standing by establishing that the government's action caused it an injury that can be redressed by the court. Second, the party must show that it is within the zone of interests that Congress intended to protect.

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103. *See* Jonathan Remy Nash, *Standing's Expected Value*, 111 MICH. L. REV. 1283, 1311 (2013) (discussing the Supreme Court's shift beginning in the 1970s from a private law model to a public law model for standing); La Belle, *supra* note 24, at 48–50 (discussing the expansion of the public law adjudication).

104. Abram Chayes, *The Role of the Judge in Public Law Litigation*, 89 HARV. L. REV. 1281, 1282 (1976).

105. *See* Sunstein, *supra* note 102, at 1436 (noting that under the common law, regulated industries had access to court while "the interests of competitors and regulatory beneficiaries were not legally cognizable"). The private law view of courts dates back to *Marbury v. Madison*. *See* 5 U.S. 137, 170 (1803) ("The province of the court is, solely, to decide on the rights of individuals . . . .").

106. Chayes, *supra* note 104, at 1284.

107. 397 U.S. 150, 153 (1970).

108. *See* Chayes, *supra* note 104, at 1307–08 (discussing six institutional advantages of a public law model of litigation).

a) Constitutional Standing

Constitutional standing is based on "concern about the proper—and properly limited—role of the courts in a democratic society."[109] Along with other justiciability doctrines, it helps maintain separation of powers by establishing "limits to the powers of an unelected, unrepresentative judiciary in our kind of government."[110] To establish constitutional standing, the plaintiff must show that she has suffered an injury in fact, an invasion of a legally protected interest which is (a) concrete and particularized and (b) actual or imminent, not conjectural or hypothetical.[111] The plaintiff must also show that the injury at issue was caused by the government's action and that the injury is redressable.[112] Standing is "substantially more difficult" to establish by third parties whom are not the direct target of a government action.[113]

In *Lujan v. Defenders of Wildlife*, a group of plaintiffs challenged a regulation that could indirectly cause harm to endangered animals outside the United States.[114] The Supreme Court held that the plaintiffs lacked injury because that the plaintiffs' plan to one day visit the animals was not "concrete" and thus did not constitute an "actual or imminent injury."[115] *Lujan* was notable because the Endangered Species Act contains a citizen–standing provision, which allowed the plaintiffs to meet the zone of interests test.[116] *Lujan* thus established that constitutional standing is a distinct requirement.

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109. Allen v. Wright, 468 U.S. 737, 750 (1984).

110. *Id.* (internal quotation marks omitted); *see also* John G. Roberts, Jr., *Article III Limits on Statutory Standing*, 42 DUKE L.J. 1219, 1230 (1993) (observing that standing protects separation of powers by ensuring "the court is carrying out *its* function of deciding a case or controversy, rather than fulfilling the *executive's* responsibility of taking care that the laws be faithfully executed").

111. *Lujan*, 504 U.S. at 560–61 (explaining that "[t]he party invoking federal jurisdiction bears the burden of establishing these elements" and that each element must be supported with evidence). The Supreme Court has admitted that standing doctrine "incorporates concepts concededly not susceptible of precise definition." *Allen*, 468 U.S. at 751.

112. *Lujan*, 504 U.S. at 561. There are other constitutional standing issues, such as the prohibition against general grievances, as well. *See* Lexmark Int'l, Inc. v. Static Control Components, Inc., 134 S. Ct. 1377, 1387 n.3 (2014) (noting that generalized grievances "do not present constitutional 'cases' or 'controversies'.").

113. *Lujan*, 504 U.S. at 562 (citation omitted).

114. *Id.* at 555, 562–63.

115. *Id.* at 564 (citation omitted).

116. *Id.* at 572 (discussing 16 U.S.C. § 1540(g)).

b) Zone of Interests

The zone of interests test is a murky administrative law doctrine. It is partially derived from § 702 of the APA, which states that a person can obtain judicial review of an agency decision if that person suffers a legal wrong because of it or is harmed by it.[117] The Supreme Court has noted that in enacting the APA, Congress did not intend "to allow suit by every person suffering injury in fact."[118] Thus, the Court held that plaintiffs must also establish that the interest they are seeking to protect is "arguably within the zone of interests" that Congress sought to protect.[119] The test is somewhat controversial, because the Court has been inconsistent in how it defines the zone of interest[120] and has made conflicting statements regarding the source of law which grounds the test.[121] The Court appears to have settled on the test being a requirement independent of constitutional and prudential standing.[122]

Courts apply the zone of interests test by asking whether the plaintiff's interests "fall within the zone of interests protected by the law invoked."[123] To do this, courts look to the traditional tools of statutory interpretation to determine "whether a legislatively conferred cause of action encompasses a

117. *See* Clarke v. Sec. Indus. Ass'n, 479 U.S. 388, 395 (1987) (describing the zone of interests test as a "gloss on the meaning of § 702"). Section 702 states that, "A person suffering legal wrong because of agency action, or adversely affected or aggrieved by agency action within the meaning of a relevant statute, is entitled to judicial review thereof." 5 U.S.C. § 702 (2012).

118. *Clarke*, 479 U.S. at 395.

119. *Id.* at 396.

120. *See* Jonathan R. Siegel, *Zone of Interests*, 92 GEO. L.J. 317, 347–50 (2004) (discussing the Supreme Court's inconsistent precedent regarding the zone of interests test and calling for greater consistency).

121. *See* Kowalski v. Tesmer, 543 U.S. 125, 128–29 (2004) (stating that the zone of interests test is an issue of prudential standing); Steel Co. v. Citizens for a Better Env't, 523 U.S. 83, 97 (1998) (stating that the zone of interests test is an issue of statutory standing); Lexmark Int'l, Inc. v. Static Control Components, Inc., 134 S. Ct. 1377, 1387 (2014) (holding that the test is an independent requirement); *see also* Siegel, *supra* note 120, at 341 (discussing the confusion regarding the legal source of the zone of interest test). An argument can also be made that the zone of interests test conflates federal question jurisdiction with standing. *See* Fletcher, *supra* note 14, at 234–35 (maintaining that the inquiry under the zone of interests test duplicates existing federal jurisdiction doctrine that considers whether the plaintiff's claim is "wholly insubstantial or frivolous").

122. *See Lexmark*, 134 S. Ct. at 1387 (maintaining that standing is not prudential, but instead, requires the court to determine "using traditional tools of statutory interpretation, whether a legislatively conferred cause of action encompasses a particular plaintiff's claim").

123. *Id.* at 1388.

particular plaintiff's claim."[124] This can include the statute's context and purpose,[125] legislative history,[126] and related regulations.[127]

The Supreme Court has recently emphasized that the zone of interests test is highly permissive. In *Lexmark International v. Static Control Components*, the Court stressed that under the APA, the test is "'not meant to be especially demanding.'"[128] It described the APA's review provision as "generous" and observed that its "lenient approach" was meant to preserve the APA's flexibility in permitting suits "for violations of numerous statutes of varying character that do not themselves include causes of action for judicial review."[129] Likewise, in *Match–E–Be–Nash–She–Wish Band of Pottawatomi Indians v. Patchak*, the Court noted that the test does "not require 'any indication of congressional purpose to benefit the would-be plaintiff,'" and maintained that "the benefit of any doubt goes to the plaintiff."[130] Importantly, the Court observed the test prevents a lawsuit only if the plaintiff's interests in the case "'are so marginally related to or inconsistent with the purposes implicit in the statute that it cannot reasonably be assumed that Congress intended to permit the suit.'"[131]

*2. Standing Under the Declaratory Judgment Act*

The DJA addresses the situation where one party is involved in a dispute with another party that could sue, but declines to do so.[132] The statute confers upon courts "unique and substantial discretion in deciding whether to declare the rights of litigants."[133] The DJA states that "[i]n a case of actual controversy within its jurisdiction . . . any court of the United States . . . may declare the rights and other legal relations of any interested party seeking

124. *Id.* at 1387.

125. *See id.* at 1389 (explaining that the Lanham Act's "detailed statement of the statute's purposes" makes it easy to identify that the plaintiff is within the zone of interests); Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians v. Patchak, 132 S. Ct. 2199, 2211 (2012) (citing to treatises that discuss the purpose of the Indian Reorganization Act).

126. *See* Barlow v. Collins, 397 U.S. 159, 164 (1970) (holding that "statutory provisions and their legislative history" implicitly showed that tenant farmers are within the zone of interests).

127. *See Pottawatomi Indians*, 132 S. Ct. at 2211 (holding that the Department of the Interior's regulations make it clear that the statute at issue is concerned about land use).

128. *Lexmark*, 134 S. Ct. at 1389 (quoting *Pottawatomi Indians*, 132 S. Ct. at 2210).

129. *Id.*

130. *Pottawatomi Indians*, 132 S. Ct. at 2210.

131. *Id.* (quoting *Clarke*, 479 U.S. at 399).

132. Donald L. Doernberg & Michael B. Mushlin, *The Trojan Horse: How the Declaratory Judgment Act Created a Cause of Action and Expanded Federal Jurisdiction While the Supreme Court Wasn't Looking*, 36 UCLA L. REV. 529, 553 (1989).

133. Wilton v. Seven Falls Co., 515 U.S. 277, 286 (1995).

such declaration, whether or not further relief is or could be sought."[134] The Supreme Court has interpreted Congress's use of the word "may" to confer discretion on the court, noting that it provides courts with "an opportunity, rather than a duty" to review.[135]

The DJA can be used to challenge patents, particularly when a patent holder threatens to sue the alleged infringer but stops short of actually suing. Prior to its passage, competitors who were not actually sued for patent infringement faced the dilemma of incurring "growing potential liability for patent infringement" or abandoning what was possibly non–infringing use.[136] The DJA provided a way for competitors to have the dispute resolved by the court.[137]

In *MedImmune v. Genentech,* the Supreme Court clarified the standing requirement for patent actions under the DJA.[138] MedImmune entered into a patent license agreement with Genentech, but believed that one of the licensed patents was invalid.[139] Because MedImmune was a licensee, it was unclear whether it could bring the suit without first breaching the license, under the theory that it would have no real apprehension of suit, and therefore no case or controversy.[140]

The Court held that to meet Article III's case and controversy requirement, the dispute at issue must be "definite and concrete, touching the legal relations of parties having adverse legal interests; and that it be real and substantial and admit of specific relief through a decree of a conclusive character, as distinguished from an opinion advising what the law would be upon a hypothetical state of facts."[141] It observed that "the question in each case is whether the facts alleged, under all the circumstances, show that there is a substantial controversy, between parties having adverse legal interests, of sufficient immediacy and reality to warrant the issuance of a declaratory judgment."[142]

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134. 28 U.S.C. § 2201(a) (2012).
135. *Wilton*, 515 U.S. at 287–88.
136. *See* Cardinal Chemical Co. v. Morton Int'l, Inc., 508 U.S. 83, 96 (1993).
137. *Id.*
138. 549 U.S. 118, 126 (2007).
139. *Id.* at 121.
140. *See id.* at 128–29; *see also* Studiengesellschaft Kohle, m.b.H. v. Shell Oil Co., 112 F.3d 1561, 1568 (Fed. Cir. 1997) (holding that a licensee cannot bring suit "until it (i) actually ceases payment of royalties, and (ii) provides notice to the licensor that the reason for ceasing payment of royalties is because it has deemed the relevant claims to be invalid").
141. *MedImmune*, 549 U.S. at 118.
142. *Id.*

The *MedImmune* Court observed that there is little case law regarding the statute's applicability "in which the plaintiff's self-avoidance of imminent injury is coerced by threatened enforcement action of *a private party* rather than the government."[143] However, it maintained that "'the requirements of [a] case or controversy are met where payment of a claim is demanded as of right and where payment is made, but where the involuntary or coercive nature of the exaction preserves the right to recover the sums paid or to challenge the legality of the claim.'"[144] Finding no Article III problems, the Court concluded that it had subject matter jurisdiction over the case.[145]

## B. CHALLENGES FOR ESTABLISHING STANDING IN THE FEDERAL CIRCUIT

### *1. Administrative Procedure Act*

The most significant obstacle for third parties attempting to sue in patent cases is meeting the zone of interests test.[146] In *Animal Legal Defense Fund v. Quigg* (*ALDF II*), the Federal Circuit declared that third parties are outside the Patent Act's zone of interests.[147] In this case, the several animal defense groups challenged the PTO Commissioner's rule that found "non-naturally occurring, non-human multicellular organisms" to be patentable subject matter under § 101, maintaining that the PTO should have used notice–and–comment rulemaking.[148]

The Federal Circuit correctly held that the appellants lacked constitutional standing. As discussed above, to meet constitutional standing, the plaintiff must show injury in fact, causation, and redressability. The court maintained that two of the appellants lacked injury in fact. The Humane Farmers Association and the Association of Veterinarians for Animal Rights claimed injury based on animal cruelty, maintaining that

143. *Id.* at 130.

144. *Id.* at 131 (quoting Altvater v. Freeman, 319 U.S. 359, 365 (1943)).

145. *Id.* at 137.

146. *See, e.g.*, Animal Legal Def. Fund v. Quigg, 932 F.2d 920, 938 (Fed. Cir. 1991) (narrowly construing the zone of interests test to limit patent challenges by non–competitors) [hereinafter *ALDF II*]; *see also* Xuan-Thao Nguyen, *Patent Prudential Standing*, 21 GEO. MASON L. REV. 17, 43–44 (2013) (criticizing the Federal Circuit's confusing application of standing that makes it difficult for nonexclusive licensees and some exclusive licensees to challenge patents).

147. *ALDF II*, 932 F.2d at 937–38.

148. Animal Legal Def. Fund v. Quigg, 710 F. Supp. 728, 729–30 (N.D. Cal. 1989) [hereinafter *ALDF I*], *aff'd on other grounds*, 932 F.2d 920 (Fed. Cir. 1991). The district court found that this rule was exempted from public notice and comment requirements of the APA. *Id.* at 732.

they would have to spend more money as a result of the rule.[149] The court concluded that standing was not met because this group of appellants failed to distinguish their harm from that of "any member of the public with a particularized conviction about protecting animals."[150]

The Federal Circuit found that the other appellants lacked causation. Several farmers and farming groups claimed to have "economic injury" with regard to members having to pay royalties to purchase animals or lose profits from having genetically inferior animals.[151] These appellants argued that causation was met because these injuries could be traced to the Commissioner's rule. The Federal Circuit disagreed, holding that causation was not met because the appellants' injuries were "speculatively dependent" on the acts of independent inventors—who must develop non–naturally occurring farm animals and seek a patent for injuries to occur.[152] The court similarly observed that the American Society for the Prevention of Cruelty to Animals and the Marin Humane Society lacked causation because they could not establish that the Commissioner's rule caused their injury of having to increase their budgets and enforcement staff to handle increased animal experimentation due to the potential patentability of animals.[153]

Rather than let the ruling rest on lack of constitutional standing, however, the Federal Circuit also held that the zone of interests test was not met. Citing to *Lujan*, the court correctly observed that the Patent Act is the relevant statute because that is the one "whose violation is the gravamen of the complaint."[154] The appellants argued that they were within the zone of interests of the Patent Act because patents are issued for "public good" and because patent case law "emphasizes the importance of the public interest and the constitutional requirement of a public benefit."[155] But the Federal Circuit disagreed, maintaining that the Patent Act cannot be so broad as to encompass challenges from any member of the public. It held broadly that the structure of the statute shows Congress's intent to provide "only the remedies provided therein to ensure that the statutory objectives would be

149. *ALDF II*, 932 F.2d at 936.
150. *Id.*
151. *Id.* at 932 (the PTO conceded that the alleged injuries sufficed to establish injury in fact).
152. *Id.* at 933.
153. *See id.* at 936–37.
154. *Id.* at 937.
155. *Id.* at 938.

realized," citing to the sections of the statute that permit civil suits as support.[156]

In an unusual move, the Federal Circuit analogized the facts of its case to that of *Block v. Community Nutrition Institute.*[157] In *Block*, the Supreme Court found that Congress implicitly precluded consumers from challenging milk marketing orders because "members of the public 'might themselves frustrate achievement of the statutory purposes.'"[158] The *Block* Court held that the statute's explicit judicial review provision for a limited group, coupled with the statute's lack of any express provision for consumer participation showed that Congress intended to exclude consumers from challenging the orders.[159] The Federal Circuit claimed that the appellants were likewise trying to thwart Congress's purposes in implementing the Patent Act by challenging the PTO in federal court.

The Federal Circuit's analysis is highly flawed for several reasons. The zone of interests test is not meant to be a gatekeeper to limit courts' dockets. Beginning in the late 1980s, the Supreme Court has taken a permissive approach to the test, emphasizing that it is not "especially demanding" and that it requires no indication on Congress's part to specifically include the

156. *Id.* (citing to 35 U.S.C. §§145 (civil action to obtain patent); 146 (civil action in case of interference); 135 (interference action; subsection (c) provides that discretionary actions by the Commissioner under that subsection are reviewable under section 10 of the APA); 281–282 (in civil action for infringement, validity of patent can be challenged defenses); 291 (civil action in case of interfering patents); 301–02 (reexamination proceedings)).

157. *Id.* at 939; Block v. Cmty. Nutrition Inst., 467 U.S. 340 (1984).

158. *ALDF II*, 932 F.2d at 938 (quoting *Block*, 467 U.S. at 352).

159. *Block*, 467 U.S. at 346–48.

plaintiff.[160] Any benefit of the doubt goes to the plaintiff.[161] The Federal Circuit failed to establish that the appellants' suit was "so marginally related to or inconsistent with the purposes implicit in the statute that it cannot reasonably be assumed" that Congress authorized the appellants to sue.[162] It provided no support in the statute or the legislative history to show that the goals of the appellants were in tension with the goals of Congress in enacting the Patent Act. More problematic, the court used such broad language that it essentially held that nobody could bring APA–based challenges against the PTO, no matter how direct or significant the injury.

The Federal Circuit further erred in relying on the *Block* decision, which was based on the doctrine of implied preclusion, and not the zone of interests test. *Block* has been interpreted by the Supreme Court to hold that if a statute allows for review of an agency action by a party who must first exhaust administrative remedies, then it creates a strong inference that parties "who are not *subject* to the administrative process" do not have the right to challenge the statute.[163] The *Block* Court emphasized the fact that the relevant statute did not have any provision expressly permitting participation by consumers[164] and observed that "the preclusion issue turns ultimately on whether Congress intended for that class to be relied upon to challenge agency disregard of the law."[165] Under the Court's reasoning, if Congress had wanted consumers to be able to challenge the agency's action, it would have given the group access to administrative remedies that were available to other groups.

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160. *See* Clarke v. Sec. Indus. Ass'n, 479 U.S. 388, 399 (1987) (holding that the zone of interests test "is not meant to be especially demanding . . . ."); *see also* Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians v. Patchak, 132 S. Ct. 2199, 2210 (2012) (holding that the test prevents a suit "only when a plaintiff's 'interests are so marginally related to or inconsistent with the purposes implicit in the statute that it cannot reasonably be assumed that Congress intended to permit suit.'") (quoting *Clarke*, 479 U.S. at 399). Indeed, parties have even met the zone of interests test in the Supreme Court with goals that were seemingly contradictory to Congress's intent. In *Bennett v. Spear*, a group of ranchers challenged Fish and Wildlife Service's (FWS) decision to reduce water to the public in order to protect endangered sucker fish. 520 U.S. 154, 159 (1997). The ranchers successfully established that they were within the zone of interests of the Endangered Species Act (ESA) notwithstanding the fact that they were not trying to protect an endangered species. *Id.* at 166. The Court's rationale was that Congress intended the best data possible to be used in making such a determination, and that the ranchers were trying to improve the quality of information that FWS was using. *Id.* at 172.

161. Lexmark Int'l, Inc. v. Static Control Components, Inc., 134 S. Ct. 1377, 1389 (2014) (recognizing that the Court has historically indicated "'that the benefit of any doubt goes to the plaintiff'" (quoting *Pottawatomi Indians*, 132 S. Ct. at 2210)).

162. *Id.* (internal quotation marks omitted).

163. Sackett v. EPA, 132 S. Ct. 1367, 1374 (2012).

164. *Block*, 467 U.S. at 347.

165. *Id.*

The Federal Circuit in *ALDF II* erred in applying *Block* to deny judicial review. In patent law, there is no mandatory administrative process that a party must exhaust before filing a lawsuit in federal district court—either under the APA or the DJA. Furthermore, the Patent Act has allowed for public participation for many years through post–grant review, which has steadily expanded over time. Congress, therefore, *does* rely on the general public to challenge the PTO's disregard for patentability standards under the Patent Act. Allowing challenges under the APA would not circumvent Congress's intent, given (1) there is no mandatory administrative process for challenging a patent and (2) Congress clearly intended for the public to assist in challenging bad patents. Consequently, it cannot be implied that Congress intended to preclude third–party challenges under the Patent Act.

*2. Declaratory Judgment Act*

There are several problems with using the DJA to protect the public for purposes of the zone of interests test. In *MedImmune, Inc. v. Genentech, Inc.*, the Supreme Court emphasized that the doctrine protects plaintiffs from "imminent injury," in the form of a threatened action by the government or a private party.[166] Although the Court rejected the Federal Circuit's strict "reasonable apprehension of suit" test,[167] there still must be "a substantial controversy, between parties having adverse legal interests, of sufficient immediacy and reality to warrant the issuance of a declaratory judgment."[168] Thus, use of the DJA in this context is viewed as protecting the rights of individuals who face imminent harm, and not the rights of the general public.[169]

166. 549 U.S. 118, 128–30 (2007).

167. The Federal Circuit previously restricted use of the DJA to cases where there was "both (1) an explicit threat or other action by the patentee, which creates a reasonable apprehension on the part of the declaratory judgment plaintiff that it will face an infringement suit, and (2) present activity which could constitute infringement or concrete steps taken with the intent to conduct such activity." Gen-Probe Inc. v. Vysis, Inc., 359 F.3d 1376, 1380 (Fed. Cir. 2004).

168. *MedImmune*, 549 U.S. at 128.

169. An argument can be made that the DJA is not as narrow as courts have interpreted. For example, Professor Megan La Belle has described the Federal Circuit's current approach to standing under the statute as "myopic" and has argued the private law approach has caused the Federal Circuit to prematurely dismiss patent declaratory judgment cases. La Belle, *supra* note 24, at 46. However, until the Supreme Court clarifies its statements from *MedImmune*, it is unlikely that the Federal Circuit will change its approach.

Following the *MedImmune* decision, the Federal Circuit has taken a narrow view of who meets the standing requirements under the statute.[170] The Federal Circuit has held that there must exist:

> (1) an explicit threat or other action by the patentee, which creates a reasonable apprehension on the part of the declaratory plaintiff that it will face an infringement suit, and (2) present activity which could constitute infringement or concrete steps taken with the intent to conduct such activity.[171]

In other words, "where a patentee asserts rights under a patent based on certain identified ongoing or planned activity of another party, and where that party contends that it has the right to engage in the accused activity without license, an Article III case or controversy will arise."[172]

The Federal Circuit emphasized that "a case or controversy must be based on a *real* and *immediate* injury or threat of future injury that is *caused by the defendants*," and narrowly construed "injury" to be a threat of suit or demand of royalty payments.[173] It further held that a plaintiff must be able to allege "an affirmative act by the patentee related to the enforcement of his patent rights," and further show "meaningful preparation to conduct potentially infringing activity."[174]

The narrowness of this standard can be seen in the *Myriad* litigation. The district court found standing for the twenty plaintiffs.[175] The Federal Circuit, however, found that only three plaintiffs had alleged "affirmative patent enforcement actions directed at them by Myriad."[176] Of those plaintiffs, only Dr. Harry Ostrer was found to have clearly alleged "a sufficiently real and imminent injury" because he claimed an intention to immediately begin offering BRCA 1 and BRCA 2 testing as soon as Myriad's patents were invalidated and because Myriad had demanded that he pay for a license.[177]

Much of the Federal Circuit's jurisprudence with regard to the DJA has been borne out of confusion. The Federal Circuit conflates elements of

170. *Id.* at 78.
171. BP Chems. Ltd. v. Union Carbide Corp., 4 F.3d 975, 978 (Fed. Cir. 1993).
172. Ass'n for Molecular Pathology v. U.S. Patent & Trademark Office, 689 F.3d 1303, 1320 (2012) (quoting SanDisk Corp. v. STMicroelectronics, Inc., 480 F.3d 1372, 1381 (Fed. Cir. 2007)).
173. *Id.* at 1319–20.
174. *Id.* at 1318.
175. Ass'n for Molecular Pathology v. U.S. Patent & Trademark Office, 702 F. Supp. 2d 181, 186–89 (2010).
176. *Ass'n for Molecular Pathology*, 689 F.3d at 1319–20.
177. *Id.*

constitutional standing, prudential standing, and ripeness.[178] The court goes back and forth on whether Article III requires it to keep the scope of standing narrow, or whether the court merely made a policy decision at some point in time.[179] But even setting aside the Federal Circuit's errors, the fact remains that the DJA—as interpreted by the *MedImmune* Court—was designed for addressing imminent harm faced by an individual, not general harm faced by the public. This makes it a flawed vehicle for bringing cases of broad public interest in which the PTO's actions harm the public, but nobody is at risk of being sued by the patent holder.

### *3. Challenges for Reforming Standing in the Federal Circuit*

The Federal Circuit's aggressive use of standing and justiciability raises the question of whether the court is attempting to insulate patent holders and the PTO from challenges, just as post–New Deal courts once shielded agencies from scrutiny. In *ALDF II*, the court maintained that if it adopted ALDF's position, it would "be opening the door to collateral attack on the validity of issued patents" and that "any competitor could simply file suit against the Commissioner [of the PTO] challenging a patent's validity."[180] In the *Myriad* litigation, Judge Moore noted in a concurrence that the court needed to be "particularly wary of expanding the judicial exception to patentable subject matter where both settled expectations and extensive property rights are involved."[181]

The Federal Circuit today is quite different from what it was twenty–five years ago in *ALDF II*. In its early years, the court used its mandate of promoting uniformity in patent law as an excuse to disregard administrative law.[182] But in the past decade, the court has gained eight new judges with a wide diversity of backgrounds. The current court has been much more likely

178. Burstein, *supra* note 58, at 505–09.

179. *See* Lisa A. Dolak*, Power or Prudence: Toward a Better Standard for Evaluating Patent Litigant's Access to the Declaratory Judgment Remedy*, 41 U.S.F. L. REV. 407, 420–25 (2007) (observing confusion within the Federal Circuit as to whether policy or Article III drives the requirement that plaintiffs suing under the Declaratory Judgment Act have "reasonable apprehension" of being sued).

180. *ALDF II*, 932 F.2d 920, 938 (1991); *see also* Burstein, *supra* note 58, at 530 n.211 (arguing that the Federal Circuit's position was probably correct because "arguably every statute that Congress passes purports to protect the public good.").

181. *Ass'n for Molecular Pathology*, 689 F.3d at 1343 (Moore, J., concurring in part).

182. *See* Sapna Kumar, *The Accidental Agency?*, 65 FLA. L. REV. 229, 258 (2013) (observing how the Federal Circuit has misconstrued the APA with regard to patent cases).

to correctly apply administrative law to patent cases,[183] perhaps signaling an end to patent law exceptionalism.[184]

The Federal Circuit, however, is still burdened by its rigid precedent. The major Federal Circuit decisions regarding standing under the APA and the DJA are the relics of an earlier court that resisted properly applying administrative law. The Federal Circuit should revisit its earlier cases and implement a broader standing doctrine that is in accordance with the Supreme Court's more public law–oriented precedent.

## IV. STANDING UNDER THE AMERICA INVENTS ACT

Although public participation in administrative patent challenges has been around in some form for more than thirty years, pre–AIA proceedings were very limited in scope. The AIA greatly expanded third parties' ability to challenge bad patents and clarified Congress's intent that the public should play a role in improving patent quality. Section A discusses the public's right to challenge patents pre–AIA. Section B examines how the AIA has dramatically expanded those rights. Section C then discusses how the AIA impacts standing.

### A. PRE–AIA THIRD–PARTY RIGHTS

Ex parte reexamination was introduced in 1980; it provided members of the public with a way to request reexamination during the life of a patent.[185]

183. For example, the Federal Circuit historically resisted applying *Chevron* deference to patent decisions from the ITC. *See* Kumar, *supra* note 86, at 553–56. But in 2015, the court reversed course and held that the *Chevron* framework was appropriate whenever the ITC interprets the Tariff Act. *See* Suprema, Inc. v. Int'l Trade Comm'n, 796 F.3d 1338, 1345 (Fed. Cir. 2015) (en banc) (holding that "Congress has delegated authority to the Commission to resolve ambiguity in Section 337 if the Commission does so through formal adjudicative procedures"); ClearCorrect Operating, LLC v. Int'l Trade Comm'n, 810 F.3d 1283, 1286 (Fed. Cir. 2015) (applying the *Chevron* framework to the ITC's interpretation of "articles"). This marks a major departure from 1999, when the Supreme Court rebuked the Federal Circuit for not following the APA when reviewing PTO decisions. *See* Dickenson v. Zurko, 527 U.S. 150, 152 (1999) (holding that the APA applies to judicial review of PTO determinations).

184. Patent law exceptionalism is the tenancy of the Federal Circuit to disregard basic administrative law precedent and principals with respect to patent decisions. *See, e.g.*, Paul R. Gugliuzza, *The Federal Circuit as a Federal Court*, 54 WM. & MARY L. REV. 1791, 1796–97 (2013) (providing examples of Federal Circuit exceptionalism); Kumar, *supra* note 182, at 277 (noting that the Federal Circuit's manipulation of law and fact and its refusal to apply proper deference to the ITC are examples of patent exceptionalism); Wasserman, *supra* note 12, at 2002 (discussing how the Supreme Court has reprimanded "the Federal Circuit for its endorsement of patent law exceptionalism.").

185. *See* Act of Dec. 12, 1980, Pub. L. No. 96-517, § 302, 94 Stat. 3015 (1980).

Reexamination was granted if the requester discovered patents or printed publications that raised "a substantial new question of patentability."[186] Congress's intent was not to protect the public against bad patents, but rather to "strengthen[] investor confidence in the certainty of patent rights"[187] and to protect patent holders from harassment.[188] Consequently, Congress allowed the requester to participate in only one response to the patent holder,[189] and did not allow the requester to participate in any appeal.[190] These limitations led to low utilization of the procedure.[191]

In 1999, Congress passed the American Inventors Protection Act, which created inter partes reexamination proceedings.[192] Like current IPRs, inter partes reexamination was based on only printed publications and prior art patents that could be used as a basis for an anticipation or obviousness challenge.[193] Three years later, Congress granted third parties the right to appeal adverse decisions to the Federal Circuit.[194]

But even with these expanded rights, several limitations remained. First, challengers could only rely upon prior art and patents; there was no mechanism for challenging a patent under subject matter or enablement.[195] Second, challengers were limited to a single response against the patent holder and strong estoppel provisions severely hindered challengers.[196]

186. 35 U.S.C. § 304 (2006).

187. H.R. REP. NO. 96-1307, pt. 1, at 3 (1980), *as reprinted in* 1980 U.S.C.C.A.N. 6460, 6462.

188. *See* Michael A. Carrier, *Post-Grant Opposition: A Proposal and a Comparison to the America Invents Act*, 45 U.C. DAVIS L. REV. 103, 112–13 (2011) (observing that under the 1981 amendments to the Patent Act, "Congress was concerned about challengers' potential harassment of patentees").

189. *Id.* at 113.

190. *See* J. Steven Baughman, *Reexamining Reexaminations: A Fresh Look at the* Ex Parte *and* Inter Partes *Mechanisms for Reviewing Issued Patents*, 89 J. PAT. & TRADEMARK OFF. SOC'Y 349, 356 (2007) (arguing that ex parte reexamination offered "fewer opportunities for the requester to participate actively" compared to inter partes review, and no opportunity to participate in any appeal).

191. *See* Carrier, *supra* note 188, at 113.

192. Intellectual Property and Communications Omnibus Reform Act of 1999, Pub. L. No. 106-113, 113 Stat. 1501 (1999).

193. 35 U.S.C. § 311(b) (2011).

194. 21st Century Department of Justice Appropriations Authorization Act, Pub. L. No. 107-273, §§ 13105-13106, 116 Stat. 1758, 1900–01 (2002); *see also* J. Steven Baughman, *Choosing* Inter Partes *Reexamination or Review: What to File, and When?*, 24 INTELL. PROP. & TECH. L.J. 8, 9 (2012) (discussing how inter partes reexamination allowed for ongoing participation by the requesting party).

195. *See* Carrier, *supra* note 188, at 114.

196. 35 U.S.C. § 314(b)(2) (2012); *see* Carrier, *supra* note 188, at 114 (describing how one estoppel provision prevented "a requester from challenging the validity of any fact determined in the examination" and another prohibited "a requester from later asserting the

Consequently, a major statutory change was needed to expand public challenges to issued patents.

## B. SCOPE OF THIRD–PARTY RIGHTS UNDER THE AMERICA INVENTS ACT

In 2011, Congress passed the AIA, which made several substantial changes to U.S. patent law.[197] The AIA provides a means for determining Congress's current intent regarding whom the Patent Act protects and whom has standing. The statutory changes in the AIA as well as the legislative history show clear intent for Congress to provide a broader role for members of the public in safeguarding patent quality.

### *1. Expressly Granted Third–Party Rights*

The AIA provided a dramatic expansion of public rights. PGRs now allow people to challenge a patent under § 101 or § 112,[198] albeit only for a nine–month window after issuance.[199] The AIA also provides for fairly formal proceedings for PGRs and IPRs that allow the public to take an active role in challenging a bad patent.[200] Either the challenger or the patent holder may request an oral hearing[201] or discovery,[202] making the public participation far more significant compared to the single response permitted under reexamination.

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invalidity of a patent on any ground that it 'raised or could have raised.") (quoting 35 U.S.C. § 315(c) (2012)).

197. *See* Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011). Reactions to the AIA were mixed. Professor Sarah Tran observed that while then–director David Kappos lauded the AIA as "the most significant overhaul to our patent system, since the founding fathers first conceived of codifying a grand bargain between society and invention," others have criticized the AIA "for being poorly written and rife with ambiguity." Tran, *supra* note 18, at 610.

198. *See* 35 U.S.C. § 321(b) (2011) (a party can bring a challenge under any patentability ground except failure to meet the best mode requirement).

199. 35 U.S.C. § 321(c) (2012); *see generally* Scott A. McKeown et al., *EPO Opposition Procedures, a Model for Post-Grant Review?*, PATENTS POST-GRANT (Mar. 7, 2010), http://www.patentspostgrant.com/epo-opposition-procedures-a-comparison-with-inter-partes-reexamination-in-the-uspto (observing a number of parallels between PGRs and European oppositions, including the nine-month time frame and the broad array of grounds for challenges).

200. *See* Wasserman, *supra* note 12, at 1988–89 (arguing that procedures for post-grant review and inter partes review are formal enough to merit *Chevron* deference).

201. 35 U.S.C. § 316(a)(10) (2012) (providing a right to an oral hearing for inter partes review); 35 U.S.C § 326(a)(10) (2012) (providing a right to an oral hearing for post grant review).

202. 35 U.S.C. § 316(a)(5) (2012) (providing a right to discovery for inter partes review); 35 U.S.C. § 326(a)(5) (2012) (providing a right to discovery for post grant review).

Congress clearly intended any member of the public to be able to be able to use IPRs and PGRs. For Covered Business Method (CBM) review, Congress explicitly noted that the party bringing the action must have been sued or charged with infringement.[203] Given that Congress knew how to limit the scope of parties bringing administrative patent challenges for CBM review, it clearly did not intend to restrict the class of challengers for PGRs and IPRs.

The AIA has furthermore made improvements to prior art submission. The AIA allows for anonymous third party submissions of prior art and requires the submitter to provide a concise description of the relevance of each piece of prior art.[204] By contrast, pre–AIA, third parties were not permitted to discuss the relevance of such prior art, thereby limiting the utility of the procedure. These statutory changes show that Congress intended to increase public participation in the patent system.

*2. Legislative History*

The AIA's legislative history further confirms Congress's intent to expand public rights to improve patent quality. The House Committee on the Judiciary issued a Report regarding H.R. 1249—the House version of the AIA. In the "Purpose and Summary" section, the House Report noted that "the need to modernize our patent laws has found expression in the courts," observing that the Supreme Court had reversed Federal Circuit patent decisions six times in a four–year period.[205] The House Report maintained that the Court's decisions "reflect a growing sense that

203. *See* Leahy-Smith America Invents Act § 18(a)(1)(B) (2012) ("A person may not file a petition for a transitional proceeding with respect to a covered business method patent unless the person or the person's real party in interest or privy has been sued for infringement of the patent or has been charged with infringement under that patent."); *see also* 37 C.F.R. § 42.302(a) (2015) ("A petitioner may not file with the Office a petition to institute a covered business method patent review of the patent unless the petitioner . . . has been sued for infringement of the patent or has been charged with infringement under that patent.").

204. 35 U.S.C. § 122(e)(2)(A) (2015).

205. H.R. REP. NO. 112-98, pt. 1, at 38–39 (2011), http://www.gpo.gov/fdsys/pkg/CRPT-112hrpt98/pdf/CRPT-112hrpt98-pt1.pdf (noting that Congress had not enacted legislation in "nearly 60 years," and that although "[t]he object of the patent law today must remain true to the constitutional command," the "form needs to change, both to correct flaws in the system that have become unbearable, and to accommodate changes in the economy and the litigation practices in the patent realm").

questionable patents are too easily obtained and are too difficult to challenge,"[206] and stated that it was "time for Congress to act."[207]

The House Report further recognized the patent community's call for "improving patent quality and providing a more efficient system for challenging patents that should not have issued."[208] More explicitly, it noted:

> The purpose of the "America Invents Act," as reported by the Committee on the Judiciary, is to ensure that the patent system in the 21st century reflects the constitutional imperative. Congress must promote innovation by granting inventors temporally limited monopolies on their inventions *in a manner that ultimately benefits the public* through the disclosure of the invention to the public.[209]

The House Report shows that Congress intended to expand the rights of the public to ensure patent quality. It discussed how once a patent application is published, "members of the public . . . may realize they have information relevant to a pending application."[210] It also observed how pre–AIA law unduly restricted the information that the public could bring to the PTO's attention.[211]

Finally, the House Report discussed the limitations of reexamination for members of the public under prior law. It noted that a third party "had fewer challenges it could raise" in reexamination than in federal court.[212] It further observed that under the old system, "the third-party challenger had no role once the proceeding was initiated" and recognized that a challenger who lost under reexamination had no right to appeal the decision.[213] It is therefore clear that in passing the AIA, Congress deliberately intended to signal an expanded role for the public in safeguarding the quality of patents.

206. *Id.* at 39 (citing referencing statements made by U.S. Senator Patrick J. Leahy during a hearing held by the Senate Judiciary Committee).

207. *Id.*

208. *Id.* at 39–40.

209. *Id.* at 40 (emphasis added).

210. *Id.* at 48.

211. *Id.* at 48–49 (explaining that while pre–AIA law permitted submissions of relevant information, such as prior art, by third parties, the submitter was "precluded from explaining why the prior art was submitted or what its relevancy to the application might be") (internal citations omitted).

212. *Id.* at 45.

213. *Id.*

## C. THE AIA'S IMPACT ON STANDING

### *1. The Zone of Interests Test is Met*

The language of the AIA and the House Report both show that members of the public seeking to invalidate bad patents are within the zone of interests protected by the AIA. As the Supreme Court noted, the test bars suit only if the plaintiff's interest is "'so marginally related to or inconsistent with the purposes implicit in the statute that it cannot reasonably be assumed that Congress intended to permit the suit.'"[214] When Congress passed the AIA, it was clearly concerned about the impact that bad patents have on the public. Under § 321 and § 311, Congress expanded the ability of third parties to file patent challenges, and the House Report emphasized the importance of increasing the quality of patents and noted that the public could play a role in improving such quality. Consequently, third–party lawsuits challenging bad patents are in no way inconsistent with Congress's intent and are consequently within the Patent Act's zone of interests.

A counterargument could be made that the AIA focused on increasing the public's role only in PTAB proceedings, not in the court system. After all, the AIA did not provide any new mechanisms for the public to file suit in federal district court. The zone of interests test, however, merely requires the plaintiff to establish that Congress's intent in enacting the pertinent statute included protecting the group that is attempting to sue.[215] Here there is ample evidence that Congress intended to increase public participation in the patent process and to protect the integrity of patents such that they benefit the public.[216] Any party that seeks to invalidate a bad patent in federal court shares Congress's interest in ensuring that issued patents ultimately benefit the public. Although Congress focused its efforts on post–grant review, it cannot be said that public interest patent litigation is "marginally related to or inconsistent with the purposes implicit" in the AIA.[217]

Congress likely recognized that there would be some actions that could not be brought in the PTAB. Challenges under § 101 and § 112 can only be brought through post–grant review within nine months of issuance, but given how rapidly Supreme Court jurisprudence is evolving, it is possible that a § 101 or § 112 problem would only manifest after the post–grant

214. Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians v. Patchak, 132 S. Ct. 2199, 2210 (2012) (quoting Clarke v. Securities Industry Ass'n, 479 U.S. 388, 389 (1987)).

215. *See* Air Courier Conf. v. Am. Postal Workers Union, 498 U.S. 517, 524 (1991).

216. *See supra*, Part IV.B.

217. *See* Lexmark Int'l, Inc. v. Static Control Components, Inc., 134 S. Ct. 1377, 1389 (2014).

period ended. Congress acknowledged that under the old law, a third party had more ways to challenge a bad patent in court than it did in the PTO. Although the AIA lessened the disparity, it did not get rid of it altogether. Given Congress's explicitly stated desire to improve patent quality, members of the public are within the zone of interests of the Patent Act.

*2. Constitutional Standing*

Constitutional standing has emerged as a sticking point in appealing PTAB proceedings. In PTAB challenges, the Patent Act permits anyone to challenge a bad patent, including those who were not harmed. This raises the question of whether the injury–in–fact requirement of constitutional standing has been met.

*a) Consumer Watchdog v. Wisconsin Alumni Research Foundation*

In 2006, Consumer Watchdog filed an inter partes reexamination proceeding before the PTO, arguing that prior art rendered Wisconsin Alumni Research Foundation's (WARF) embryonic stem cell patents invalid.[218] Although some of WARF's claims were initially rejected, WARF subsequently amended the claims to narrow them and was successful in having the patents reissued.[219]

Consumer Watchdog appealed to the Federal Circuit, only to have its appeal dismissed for lack of standing. The court noted that under *Lujan*, a plaintiff "must show that it has suffered an 'injury in fact' that is both concrete and particularized, and actual or imminent."[220] The court observed that Consumer Watchdog did not engage in any activity involving embryonic stem cells, nor did it have any intention to do so. It further noted that Consumer Watchdog was not a licensee of the patents at issue.[221] Consumer Watchdog maintained that its requested reexamination proceeding conferred standing.[222] However, the Federal Circuit found that the PTO's "disagreement with Consumer Watchdog did not invade any legal right conferred by" the Patent Act, and observed that "[t]he statute did not guarantee a particular outcome favorable to the requester."[223]

218. Consumer Watchdog v. Wis. Alumni Research Found., 753 F.3d 1258, 1260 (Fed. Cir. 2014).

219. Found. for the Taxpayer v. Wis. Alumni Research Found., No. 2012-011693, 2013 WL 5397843, at *7 (Bd. Pat. App. & Interf., Jan. 22, 2013).

220. *Consumer Watchdog*, 753 F.3d at 1261.

221. *Id.*

222. *Id.*

223. *Id.* at 1262.

The Federal Circuit further rejected Consumer Watchdog's argument that the Patent Act's allowance of appeals to the court conferred standing. The court disagreed, observing that a statutory grant of a procedural right does not eliminate the requirement that the plaintiff "have a particularized, concrete stake in the outcome of the reexamination."[224] The court thus concluded that "Consumer Watchdog has only alleged a general grievance" concerning the stem cell patent and denied the appeal.[225]

Although *Consumer Watchdog* involved the pre–AIA Patent Act, the same reasoning would apply to IPRs and PGRs under the AIA. Under the Patent Act, a party to either proceeding can appeal the PTAB's decision to the Federal Circuit.[226] However, although the explicit right to appeal allows plaintiffs to automatically meet the zone of interests test, a plaintiff must also establish constitutional standing.

b) Supreme Court Precedent and *Consumer Watchdog*

Although the *Consumer Watchdog* decision has attracted some criticism,[227] it fits within existing administrative law precedent. The most analogous Supreme Court decision is *Federal Election Commission v. Akins*, in which the Court dealt with the issue of injury in fact and general grievances.[228] The Federal Election Commission (FEC) determined that the American Israel Public Affairs Committee (AIPAC) was not a "political committee" under the Federal Election Campaign Act (FECA) and was therefore not obligated to release information regarding its membership.[229] A group of voters whose views were opposed to AIPAC filed a complaint with the FEC, seeking to have the information released. The FEC investigated the allegations but ultimately decided that AIPAC was not a political committee subject to the FECA. Although the voters' injury was intangible, the Court held that injury in fact was met because the information would help the voters evaluate candidates running for public office.[230]

224. *Id.*; *see also* Summers v. Earth Island Inst., 555 U.S. 488, 497 (2009) ("Unlike redressability . . . the requirement of injury in fact is a hard floor of Article III jurisdiction that cannot be removed by statute.").

225. *Consumer Watchdog*, 753 F.3d at 1263.

226. 35 U.S.C. § 141(c) (2015).

227. *See* Dreyfuss, *supra* note 42, at 294–95; *see also infra* note 246 and accompanying text).

228. 524 U.S. 11 (1998).

229. 524 U.S. 11, 13 (1998).

230. *Id.* at 21; *see also* Spokeo, Inc. v. Robins, 136 S. Ct. 1540 (2016) (observing that "[a]lthough tangible injuries are perhaps easier to recognize," that the Supreme Court has confirmed that intangible injuries can be concrete and meet the injury-in-fact requirement).

The *Akins* Court also clarified what constitutes a general grievance. The Court noted that for widely shared grievances, "the political process, rather than the judicial process, may provide the more appropriate remedy."[231] The Court noted that a generalized grievance "appears in cases where the harm at issue is not only widely shared, but is also of an abstract and indefinite nature."[232] In other words, plaintiffs must be able to show injury to their own interests as opposed to merely possessing a general interest in the administration of the law.[233] The Court concluded that although the plaintiffs' injury was widely shared, their harm was sufficiently concrete.[234]

The injuries that Consumer Watchdog alleged were shared by the general public and were of an "abstract and indefinite nature." Consumer Watchdog maintained that WARF's "broad and aggressive assertion" of its patent put "a severe burden" on taxpayer–funded research in California.[235] By contrast, the plaintiffs in *Akins* could show that they were injured by the lack of information, which Congress recognized as a harm, and which affected their ability as individuals to make an informed decision when voting.[236]

Another problem with Consumer Watchdog's appeal was that it was attempting to represent the interests of other parties. The organization's stated mission is to be "a voice for taxpayers and consumers in special interest-dominated public discourse, government and politics."[237] The Supreme Court has held that a party "generally must assert his own legal rights and interests, and cannot rest his claim to relief on the legal rights or interests of third parties."[238] The concern is that without this limitation, courts would be forced to decide "abstract questions of wide public significance" that other governmental institutions could more competently

231. *Akins*, 524 U.S. at 23.

232. *Id.*

233. *Id.* at 23–24.

234. *Id.* at 24–25.

235. Opening Brief for Appellant at 2, Consumer Watchdog v. Wis. Alumni Research Found., 753 F.3d 1258, 1260 (Fed. Cir. 2014) (No. 2013-1377), 2013 WL 3489791, at *1–2. Consumer Watchdog's opening and reply briefs did not address standing; it likely did not anticipate that constitutional standing could be a problem given the express right to appeal granted in the Patent Act.

236. *Akins*, 524 U.S. at 24–25 (concluding that "the informational injury at issue" was "directly related to voting, the most basic of political rights, is sufficiently concrete and specific such that the fact that it is widely shared does not deprive Congress of constitutional power to authorize its vindication in the federal courts").

237. Opening Brief for Appellant at 2, Consumer Watchdog v. Wis. Alumni Research Found., 753 F.3d 1258, 1260 (Fed. Cir. 2014) (No. 2013-1377), 2013 WL 3489791, at *1.

238. Kowalski v. Tesmer, 543 U.S. 125, 129 (2004).

address.[239] The only exceptions to the prohibition are if "the party asserting the right has a 'close' relationship with the person who possesses the right" or the right holder is hindered in protecting its own interest.[240] Consequently, Consumer Watchdog should have sought out researchers whose work was actually being hindered to join as plaintiffs on the challenge.[241]

Professor Dreyfuss has argued that the Supreme Court's decision in *ASARCO Inc. v. Kadish* supports standing for challengers who lose in the PTAB.[242] In state court, taxpayers and a teacher's association challenged an Arizona statute that permitted a state agency to lease minerals. The Arizona Supreme Court held that the statute was unconstitutional, and a group of mineral lessees appealed to the U.S. Supreme Court.[243] The United States argued that the case should be dismissed because the plaintiffs could not have filed the suit as an original action in federal court due to lacking constitutional standing.[244] The United States' argument was based on the fact that people generally cannot file federal lawsuits on the mere basis of being taxpayers, because such interests are generalized grievances shared by millions of other people.[245]

The *ASARCO* Court held that standing existed. The Court recognized that the plaintiffs would not have had standing to bring the original action in federal court, due to having a widely shared injury that was not distinct.[246] However, it recognized that state courts are not bound by federal standing requirements and possess authority "to render binding judicial decisions" on federal law.[247] The Court thus decided that the constitutional standing requirements applied to the first party to invoke federal judicial power, which in this case, was the defendant.[248] It concluded that that standing was

239. *Id.*

240. *Id.* at 130.

241. One could also argue that Consumer Watchdog is trying to solve a problem that could more effectively be addressed by Congress. For example, Congress passing a research exemption allowing not–for–profit researchers to utilize patented technology would address Consumer Watchdog's concerns.

242. Dreyfuss, *supra* note 42, at 295 (citing ASARCO Inc. v. Kadish, 490 U.S. 605 (1989)).

243. *ASARCO*, 490 U.S. at 611.

244. *Id.* at 612.

245. *Id.* at 613.

246. *Id.* at 613–15. Generally, people cannot file federal lawsuits on the mere basis of being taxpayers, because such interests are generalized grievances shared by millions of other people. *Id.*

247. *Id.* at 618.

248. *Id.* at 618–19.

met because the state court's decision posed a threat to the validity of the defendants' mineral leases.[249]

*Consumer Watchdog* can be distinguished from *ASARCO* on several grounds. In *ASARCO*, the Supreme Court found it notable that the plaintiffs wanted the state court, not the federal court, to hear the case. By contrast, in *Consumer Watchdog*, the plaintiff was actively trying to have its case heard by a federal court and could not show that it had lost anything concrete due to the PTAB's ruling, as it suffered no direct injury. Furthermore, the *ASARCO* decision was grounded in federalism concerns. The Supreme Court recognized that it had no authority to impose federal standing requirements on a state court that chose to exercise jurisdiction over a federal matter.[250] By contrast, no federalism concerns existed in *Consumer Watchdog*, and the plaintiff merely alleged a generalized grievance.[251]

c) Policy Concerns with *Consumer Watchdog*

The problem remains that third party actions represent an imperfect solution to a flawed patent system, providing a mechanism for challenging bad patents when direct competitors refuse to do so.[252] The fact that standing does not automatically exist to appeal PTAB decisions poses a problem for the integrity of post–grant challenges. For agency adjudication, an internal level of appeal typically exists before the plaintiff has to appeal to a federal appellate court. For example, in patent proceedings in the International Trade Commission, the plaintiff first litigates before an administrative law judge, whose decision is then reviewed by six Commissioners.[253] For post–grant challenges, however, the Federal Circuit is essentially playing the role of the second level of agency review.[254] There are currently 267

249. *Id.*

250. *Id.* at 617 (holding that the Arizona court had the right to disregard federal standing requirements, and maintaining this outcome "properly follow from the allocation of authority in the federal system").

251. *See* Rinehart, *supra* note 24, at 399 (noting when a third party "alleges a public harm to competition that affects general health and safety," that such a party "seeks to raise a generalized grievance," which is generally prohibited).

252. *See* Bernstein, *supra* note 24, at 110–113, 135–36 (discussing how end users are harmed by patents and proposing an expansion of end-user standing as a partial remedy); La Belle, *supra* note 24, at 56, 98–99 (discussing how federal court adjudication "is the primary gatekeeper of patent quality" and maintaining that the Federal Circuit should relax standing requirements).

253. 19 U.S.C. §§ 1330, 1337 (2012).

254. *See* John M. Golden, *Working Without* Chevron: *The PTO as Prime Mover*, 65 DUKE L.J. 1657, 1678–79 (2016) (observing that after the AIA, the PTO remains "the

Administrative Patent Judges.[255] Although the three–judge panels for PTAB decisions should improve the quality of the patent judges' decisions,[256] it will be difficult for panels to maintain uniformity with each other. Moreover, out of the thousands of decisions issued by the PTAB and its predecessor, only thirty–five precedential opinions currently exist.[257]

The Federal Circuit serves an important role in creating consistency in PTAB jurisprudence, and yet, it cannot properly serve that role when the plaintiff lacks standing. Part V makes suggestions for how this problem can be addressed.

## V. IMPROVING PTAB REVIEW

Bad patents harm many people—direct competitors who cannot offer competing goods, end users that pay higher prices, scientists who are unable to conduct research, and the general public that misses out on products and services that are never offered. Public challenges to patents provide an imperfect solution by serving as a failsafe when a bad patent gets issued and direct competitors are unwilling or unable to challenge it.

However, the PTAB will occasionally make mistakes, sometimes invalidating a claim that should have been left in place and sometimes finding a claim to be valid that is actually invalid. If the PTAB mistakenly invalidates a valid claim, then the patent holder can appeal to the Federal Circuit. But if the PTAB mistakenly leaves an invalid claim in place, a member of the public will lack constitutional standing and not be able to appeal, leading to an asymmetry.

This Part looks at ways to improve PTAB review and facilitate third–party challenges. Section A observes that Congress can create constitutional standing by adding a qui tam provision to post–issuance procedures. Section B suggests that Congress institute a second level of review within the PTAB to improve uniformity and lessen the Federal Circuit's role in reconciling disparate PTAB decisions.

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primary, day-to-day authority on the meaning of substantive provisions of the Patent Act.").

255. *See* U.S. PATENT & TRADEMARK OFFICE, PATENT PUBLIC ADVISORY COMMITTEE MEETING (2016), https://www.uspto.gov/sites/default/files/documents/PPAC_Transcript_20160818.pdf.

256. *See generally* Thomas J. Miles & Cass R. Sunstein, *Do Judges Make Regulatory Policy? An Empirical Investigation of* Chevron, 73 U. CHI. L. REV. 823 (2006) (discussing decision–making for panels of judges).

257. Golden, *supra* note 254, at 1686.

## A. CREATING CONSTITUTIONAL STANDING

An unorthodox solution to the problem of constitutional standing lies in qui tam actions, which allow Congress to utilize private citizens to enforce federal law. In a qui tam action, a private party, known as a "relator," brings an action on behalf of the government.[258] If the government's action succeeds, the private party receives a share of the award. For example, the False Claims Act permits a party to bring a qui tam action alleging fraud on the government.[259] As discussed below, parties that bring qui tam actions automatically have standing, making this a possible way for allowing members of the public to appeal an adverse PTAB determination.

### *1. Overview of Qui Tam Litigation*

Qui tam litigation in the United States was adopted from the English legal system, which once relied heavily on qui tam litigation to perform the tasks of the police, government prosecutors, and administrative officials.[260] In the eighteenth and nineteenth century, qui tam legislation in England was used for economic regulation, promoting public safety, and protecting the environment.[261] Although qui tam litigation is no longer used England,[262] four qui tam provisions remain in the United States.[263] The most heavily used provision is under the False Claims Act (FCA); § 3729 of the FCA prohibits people from making fraudulent claims for payment against the government,[264] and § 3730 allows private parties to bring an action on behalf of the federal government for a violation of § 3729.[265]

Qui tam actions were once a part of the Patent Act. Prior to the enactment of the AIA, § 292 of the Patent Act made it unlawful for any person to engage in false patent marking with intent to deceive the public.[266]

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258. *See* United States *ex rel.* Eisenstein v. City of New York, 556 U.S. 928, 932 (2009) (discussing qui tam actions under the False Claims Act); *see also* Evan Caminker, Comment, *The Constitutionality of* Qui Tam *Actions*, 99 YALE L.J. 341 (1989) (providing a detailed overview of qui tam actions).

259. *Eisenstein*, 556 U.S. at 932. For an overview of qui tam litigation in the U.S., see John M. Golden, *Patent Privateers: Private Enforcement's Historical Survivors*, 26 HARV. J.L. & TECH. 545, 577–84 (2013) (providing an overview of qui tam actions in patent law).

260. J. Randy Beck, *The False Claims Act and the English Eradication of* Qui Tam *Legislation*, 78 N.C. L. REV. 539, 566 (2000).

261. *Id.* at 591.

262. *Id.* at 606–08.

263. Richard A. Bales, *A Constitutional Defense of* Qui Tam*,* 2001 WIS. L. REV. 381, 387–88 (2001).

264. 31 U.S.C. § 3729 (2012).

265. 31 U.S.C. § 3730(a) (2012).

266. 35 U.S.C. § 292(a) (2012).

It included a qui tam provision, allowing any person to sue for false marking and split the proceeds from the suit evenly with the government.[267] This provision was controversial for several reasons. Although some scholars and judges argued that false marking is harmful,[268] it was expensive for businesses to remove patent numbers from products whenever a patent expired, yet it was very cheap for consumers to verify whether a patent was still valid.[269] Moreover, courts struggled with how to calculate an appropriate fine, given that § 292 provided discretion to courts.[270] Consequently, the provision was eliminated under the AIA in late 2011.[271]

*2. Standing in Qui Tam Litigation*

What is notable about qui tam litigation is the fact that plaintiffs who bring such suits automatically have standing. The Supreme Court has held that under the False Claims Act that the Government's partial assignment of damages, coupled with its injury in fact, confers standing to a third party bringing a qui tam action.[272] The Court noted that there was a long tradition in England and the American Colonies of permitting such suits, indicating that they were in the category of "cases and controversies of the sort traditionally amenable to, and resolved by, the judicial process."[273] The same reasoning applies to other statutes that provide a monetary reward to the plaintiff.

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267. *Id.*

268. *See* Elizabeth I. Winston, *The Flawed Nature of the False Marking Statute*, 77 TENN. L. REV. 111, 132–34 (2009) (maintaining that false marking is harmful to consumers due to the erroneous belief that patented products are somehow superior to unpatented counterparts, and arguing that the government has a broad interest in preventing deceit); Clontech Lab., Inc. v. Invitrogen Corp., 406 F.3d 1347, 1356–57, n.6 (Fed. Cir. 2005) ("[T]he act of false marking misleads the public into believing that a patentee controls the article in question (as well as like articles), externalizes the risk of error in the determination, placing it on the public rather than the manufacturer or seller of the article, and increases the cost to the public of ascertaining whether a patentee in fact controls the intellectual property embodied in an article.").

269. *See* Thomas F. Cotter, *Optimal Fines for False Patent Marking*, 17 MICH. TELECOMM. & TECH. L. REV. 181, 185–87 (2010) (discussing the costs associated with § 292).

270. *Id.* at 188 (discussing the wide range of approaches to fining violators under § 292).

271. *See* David Kwok, *Determining Standing and Damages for "Competitive Injury" from False Patent Marks*, 17 VA. J.L. & TECH. 171, 175 (2012) (discussing how the AIA eliminated the qui tam provision and allows only the United States and parties that suffer "competitive injury" to sue).

272. Vt. Agency of Nat. Res. v. United States *ex rel.* Steven, 529 U.S. 765, 773 (1999).

273. *Id.* (quoting Steel Co. v. Citizens for Better Env't, 523 U.S. 83, 102 (1998)).

Likewise, the Federal Circuit has held that plaintiffs who sued under the Patent Act's pre–AIA false marking provision had standing.[274] The court noted that by passing legislation prohibiting deceptive mismarking, Congress decided that mismarking is harmful. Given that the government has standing to enforce its own law, a plaintiff bringing a qui tam action "as the government's assignee" would also have standing.[275] The court distinguished the case from *Lujan*, where the suit was against the Government and where no party had established injury.[276] It further clarified that an injury to the Government's sovereignty arising from violation of its laws is assignable to a third party.[277]

*3. Qui Tam and Administrative Patent Challenges*

Congress has already acknowledged that the issuance of bad patents is harmful. If it wishes to empower members of the public to challenge patents in the PTAB and allow them to appeal adverse decisions to the Federal Circuit, it could create constitutional standing through use of a qui tam provision. Such a provision might say:

> (a) Whoever holds patent protection on a claim that that violates §§ 101, 102, 103, or 112 shall be fined $50 per invalidated claim, not to exceed $100 per patent.
>
> (b) Any person may institute inter partes review or post grant review under § 311 or § 321 respectively for the penalty, in which event one–half shall go to the person suing and the other to the use of the United States.

The patent holder whose claims are invalidated would have to pay the small fee, with the government and the plaintiff splitting the penalty. Because the government is the real party of interest, the plaintiff should automatically have standing to appeal from the PTAB to the Federal Circuit.[278]

The introduction of a new qui tam action would no doubt be controversial. General concerns are that qui tam provisions encourage the government to permit suits that it ordinarily would not initiate and that

274. Stauffer v. Brooks Bros., Inc., 619 F.3d 1321, 1325 (Fed. Cir. 2010).
275. *Id.* at 1326.
276. *Id.* at 1325–26.
277. *Id.* at 1326.
278. It is unclear whether there could be a qui tam provision without any fee being paid to the relator. In *Vermont Agency of Natural Resources,* the Supreme Court emphasized the fact that there was a partial assignment of the Government's damages claim. 529 U.S. at 773. But it is unclear that a damages award is mandatory for qui tam standing.

parties will misuse them for financial gain.[279] Although public prosecutors can exercise judgment in deciding which conduct to challenge, there is a concern that financially–motivated relators will ignore the public welfare in filing qui tam suits.[280]

However, many of the common problems with qui tam litigation can be avoided. First, PTAB proceedings have built–in safeguards. Typical qui tam actions are filed directly in federal court with a generalist judge. But for post–grant challenges, expert PTAB judges ultimately decide which proceedings can go forward. These judges are more than sufficiently skilled to ensure that the challenging party is not making misrepresentations about prior art. Second, making the financial compensation very low will prevent parties from bringing such challenges solely for financial gain. Congress has explicitly recognized that bad patents pose a threat to the public; a qui tam provision would ensure that members of the public are able to challenge bad patents while allowing the PTAB to block unmeritorious challenges.

### B. INTRA–AGENCY APPEALS

The current structure of the PTAB presents challenges for the agency in maintaining uniformity for post–issuance proceedings. Under the AIA, once a PTAB panel has issued an order for an IPR or PGR, the only avenue of appeal is directly to the Federal Circuit. Because there are close to 300 patent judges, the lack of internal appeal makes it difficult for the PTAB to maintain uniformity. The scarcity of precedential opinions from the PTAB further exasperates this problem.

Congress could help promote uniform adjudication by creating a level of appeal inside the PTAB. Such a system could be modeled after the International Trade Commission.[281] Congress could structure this by having parties appeal adverse PTAB decisions to a group of Commissioners. The

279. *See* Dayna Bowen Matthew, *The Moral Hazard Problem with Privatization of Public Enforcement: The Case of Pharmaceutical Fraud*, 40 U. MICH. J.L. REFORM 281, 297, 300 (2007) (observing that financially motivated plaintiffs will "pursue cases with poor factual support or pursue flimsy legal theories that establish bad precedent and waste public resources" and maintaining that the qui tam provision of the False Claims Act has led to excessive prosecution that the government alone would not have engaged in).

280. Beck, *supra* note 260, at 611 (observing that a "qui tam statute operates by appealing to the pecuniary interests of informers" and noting that if the "informer's personal financial interest conflicts with public interests affected by an enforcement action, the public interest typically will be sacrificed").

281. The ITC has six Commissioners that oversee six administrative law judges (ALJs). The ALJ issues an initial determination, then the Commission has sixty days to review it. The Commission can decline to review it (allowing the ALJ decision to stand), review and adopt it, modify it, or reverse it. Kumar, *supra* note 86, at 537.

Commissioners could then have ninety days to decide whether to accept the decision of the panel or to choose to revisit the case. Any decision issued by the Commissioners could automatically be made precedential. Alternatively, Congress could have PTAB decisions appeal to the PTO Director or to some other agency official.

Having an extra level of appeal would have several advantages. It would allow the PTAB to increase the uniformity by providing it with a mechanism for correcting erroneous decisions, and would reduce dependence on the Federal Circuit to correct errors.[282] Congress could then require the Federal Circuit to provide strong deference to PTAB decisions under *Chevron v. Natural Resources Defense Council, Inc*.[283] Several scholars have already argued in favor of applying such deference to PTAB decisions as they currently stand.[284] However, the current system has the weakness of depending on the Federal Circuit to unify the law.[285] By adding an internal level of appeal, the Federal Circuit would no longer be forced into the role of the de facto head of the PTO. Such an approach could ultimately save costs by shifting the heavy lifting from the Federal Circuit to the PTO and reducing the need for costly Federal Circuit appeals.

## VI. CONCLUSION

Members of the public play an important role in the patent system by challenging bad patents. Unlike direct competitors, third parties do not face repercussions from patent holders, nor do they have patents of their own at risk of invalidation. In expanding post–grant challenges under the AIA, Congress recognized that the general public can make a valuable contribution in patent law.

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282. Admittedly, a downside of adding an internal appeal is that it would raise the overall cost of litigation. The challenger and patent holder would have to pay extra attorney's fees to cover the cost of the appeal inside the PTAB.

283. Chevron, U.S.A., Inc. v. Nat. Res. Def. Council, Inc., 467 U.S. 837, 843–44 (1984) (requiring courts to uphold an agency's reasonable interpretation of its ambiguous organic statute).

284. *See* Stuart Minor Benjamin & Arti K. Rai, *Administrative Power in the Era of Patent Stare Decisis*, 65 DUKE L.J. 1563, 1582–83 (2016) (arguing that the AIA confers the PTAB with the power to act with the force of law for IPRs, PGRs, and CBMs); Wasserman, *supra* note 12, at 1999, 2005 (arguing that although Congress failed to grant the PTO substantive rulemaking authority under the AIA, that "Congress intended the [PTO's] post grant review proceedings to be effectuated through formal adjudication," and thereby granted it power to speak with the force of law).

285. *See* Golden, *supra* note 254, at 1683.

The doctrine of standing, however, currently impedes meritorious patent challenges. Part of the fault lies with the courts. The Supreme Court has emphasized that the APA's review provision is "generous" and maintained that a "lenient approach" to the zone of interests test is appropriate for "preserving the flexibility" of the APA's judicial review provision.[286] The Court has been clear that the test bars suit "only when a plaintiff's interests are so marginally related to or inconsistent with the purposes implicit in the statute that it cannot reasonably be assumed that Congress authorized that plaintiff to sue."[287] Nevertheless, the Federal Circuit has limited the zone of interests test to direct competitors, thereby artificially constraining the class of people that can challenge the PTO's actions. The Supreme Court has shown little interest in intervening.

Although the Federal Circuit deserves blame, Congress is also at fault. In passing the AIA, it created a mechanism for third parties to challenge bad patents, and attempted to provide a path to appealing adverse PTAB decisions in the Federal Circuit. Having an avenue of appeal is important, given that Congress depends on the Federal Circuit to reconcile conflicting PTAB decisions and to generally serve as the de facto head of the PTO. But as the Federal Circuit has correctly observed, public interest groups lack constitutional standing, because they cannot show that they were injured any more than the public at large. This creates an asymmetric system where patent holders can challenge adverse PTAB decisions, but members of the public cannot.

The solution to these problems lies with Congress. One option is for Congress to pass a new qui tam provision to create constitutional standing for all PTAB litigants. Such a statutory change would formally recognize that members of the public serve an important role in challenging bad patents that are detrimental to society. Alternatively, Congress could add an internal level of appeal within the PTAB to improve uniformity and provide protection against erroneous decisions from administrative patent judges. These changes would advance Congress's goal of giving third parties greater access to the PTO, while preserving the overall integrity of the patent system.

286. Lexmark Int'l, Inc. v. Static Control Components, Inc., 134 S. Ct. 1377, 1389 (2014).

287. *Id.* (quoting Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians v. Patchak, 132 S. Ct. 2199, 2210 (2012)).

# DIVERSIFYING THE DOMAIN NAME GOVERNANCE FRAMEWORK

*Alice A. Wang*[†]

## ABSTRACT

The Internet gives rise to a number of puzzles about how it should be governed. In particular, international disputes over Internet domain names have become increasingly commonplace as "cybersquatters" buy up domain names evocative of famous entities with the intention of arbitraging them for a profit. In response to this problem, the United States passed the Anticybersquatting Consumer Protection Act (ACPA). The ACPA allows for the extraterritorial application of U.S. trademark law to foreign actors by creating an in rem cause of action against Internet domain names themselves.

This Note discusses the legal and policy–based arguments against the current ACPA regime and suggests several reforms to ameliorate the ACPA's problems. Legally, the application of the ACPA against foreign registrants violates due process because the minimum contacts requirement is not met and because the registration process does not provide adequate notice to registrants about their exposure to U.S. laws. Furthermore, the ACPA's definition of multiple situses for a domain name is incoherent and leads to a suboptimal allocation of authority over domain name disputes, both internationally and within the United States. The ACPA regime also disregards foreign trademark regimes and competes unnecessarily with already–existing international dispute resolution mechanisms. This Note proposes that the situs of a domain name be limited to one location and that registrar contracts be revised to provide registrants more notice, solutions which would curtail the worst effects of the ACPA.

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## I. INTRODUCTION

The growth of the Internet has raised complex issues regarding its governance. As a virtual system in which users of different nationalities freely interact, the Internet is a medium in which the policies of any one state can have profound consequences for others.[1] The governance of the Domain Name System (DNS) is one such area where unilateral efforts to

1. The debate over Internet jurisdiction is complicated by the fact that the Internet is a system of connected networks and does not have a centralized location or storage point. For further discussion of these issues, see Asaad Siddiqi, *Welcome to the City of Bytes? An Assessment of the Traditional Methods Employed in the International Application of Jurisdiction over Internet Activities—Including a Critique of Suggested Approaches*, 14 N.Y. INT'L L. REV. 43, 49 (2001).

address the problem of domain name disputes and trademark infringement have resulted in a skewed and inconsistent system of governance.[2]

As websites have become important tools of communication and publicity, the number of disputes over Internet domain names has risen dramatically.[3] Cybersquatting—the practice in which speculators buy up domain names evocative of famous entities with the hope of arbitraging them for a profit—has become a problem for businesses,[4] sports teams,[5] and politicians[6] alike. For example, the Brooklyn Nets faced a problem for many years over the fact that they do not own "Nets.com." The many fans who visited "Nets.com" looking for their team's website were greeted instead by an image of Mark Cuban sticking out his tongue and a message that read, "Looking for the Brooklyn Nets? They're not here…but they SHOULD be!"[7] When interviewed by the *New York Times*, the owner of the domain said she hoped to sell "Nets.com" to the Nets for millions of dollars.[8] Although the Nets have resisted buying the domain, many businesses cave in to cybersquatters' demands when faced with the prospect of losing business over online obscurity. The same cybersquatter successfully sold the domain name "Roadrunner.com" to Time Warner for a seven–figure profit.[9]

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2. *See* Natalia Ramirez, *Will the Anticybersquatting Consumer Protection Act Create More Problems Than It Solves?*, 8 WASH. U. J.L. & POL'Y 395, 412–13 (2002) ("The domain name system illustrates a fundamental dichotomy between trademark law and the complexities of Internet technology: while trademark law is territorial, the Internet is universal.").

3. *Domain Name Wars: Cybersquatting Disputes Reach Record Figures*, UWP GROUP, http://www.uwpgroup.co.uk/blog/domain-name-wars-cybersquatting-disputes-reach-record-figures/ (last visited Aug. 20, 2017).

4. One of the earliest cybersquatting cases involved McDonald's. *See* Sung Yang, *Staking a Claim in Cyberspace: An Overview of Domain Name Disputes*, 36 WILLAMETTE L. REV. 115, 126–27 (2000).

5. Andrew Keh, *Taunting Nets? Family Makes That Its Domain*, N.Y. TIMES (Nov. 11, 2014), http://www.nytimes.com/2014/11/12/sports/basketball/taunting-nets-family-makes-it-their-domain-.html.

6. *Running for President? Better Name Your Website Domain Early*, N.Y. TIMES: FIRST DRAFT (May 4, 2015, 11:30 AM), http://www.nytimes.com/politics/first-draft/2015/05/04/running-for-president-register-your-domain-names-early. For more on the legal problems associated with registering people's names as domain names, see generally Benjamin B. Cotton, *Prospecting or Cybersquatting: Registering Your Name Before Someone Else Does*, 35 J. MARSHALL L. REV. 287 (2002).

7. Keh, *supra* note 5.

8. *Id.*

9. *Id.*

In response to the cybersquatting problem, Congress passed the Anticybersquatting Consumer Protection Act of 1999 (ACPA).[10] In part, the ACPA was motivated by the recognition that the anonymity of the Internet made it difficult for trademark holders to take action against domain name owners even when they had legitimate claims of trademark infringement.[11] This difficulty arises because many cybersquatters register domain names under aliases or with false information to protect their privacy[12] and to avoid service of process.[13] To provide relief in cases where the domain name owner cannot be found or is beyond the jurisdiction of U.S. courts, the ACPA allows trademark holders to bring in rem[14] lawsuits against the Internet domain names themselves and have the domain name transferred to them.[15] The ACPA gives jurisdiction over such lawsuits to the U.S. judicial district where the domain name registrar, domain name registry, or

10. *See* 15 U.S.C. § 1125(d)(2)(A) (2012). The Act amended Section 43 of the Lanham Act.

11. *See* H.R. REP. NO. 106-412, at 14 (1999).

12. Because each domain name owner's contact information is posted online in the WHOIS database, domain name owners risk a myriad of privacy problems, including spam, identity theft, and loss of data. *See* Mark V.B. Partridge & Scott T. Lonardo, *Icann Can or Can It? Recent Developments in Internet Governance Involving Cybersquatting, Online Infringement, and Registration Practices*, 1 LANDSLIDE 24, 24 (2009), http://chicagoipalliance.com/files/2009/11/ABA-Landslide-article-reICANN.pdf. Likely because of this, it is extremely common for WHOIS information to be false. A study found that over seventy–seven percent of domain registrations contain false, incomplete, or unverifiable information. Kieren McCarthy, *77% of Domain Registrations Stuffed with Rubbish*, REGISTER (Feb. 17, 2010, 7:50 AM), http://www.theregister.co.uk/2010/02/17/domain_name_problems.

13. H.R. REP. NO. 106-412, at 10 (1999) ("A significant problem faced by trademark owners in the fight against cybersquatting is the fact that many cybersquatters register domain names under aliases or otherwise provide false information in their registration applications in order to avoid identification and service of process by the mark owner. The bill, as amended, will alleviate this difficulty. . . .").

14. In rem jurisdiction refers to the power of a court over an item of real or personal property. Bhanu K. Sadasivan, *Jurisprudence Under the* In Rem *Provision of the Anticybersquatting Consumer Protection Act*, 18 BERKELEY TECH. L.J. 237, 237 n.5 (2003). In rem actions are brought directly against a property interest and often serve to settle claims against both tangible and intangible property. *Id.* The judgment in an in rem decision thus determines the title or status of the property named in the action. *See id.* Examples of common in rem proceedings are those brought to quiet title to land, condemn personal property, or administer a decedent's estate. *See* P. Wayne Hale, *The Anticybersquatting Consumer Protection Act &* Sporty's Farm L.L.C. v. Sportman's Market, Inc., 16 BERKELEY TECH. L.J. 205, 223 n.129 (2001) (explaining that suits in rem are brought "against the property itself"). The satisfaction of due process requirements in such cases is based on the notice to all those who may have an interest in the property. *See id.* at 213 (describing the due process requirements for proceeding in rem against a domain name).

15. S. REP. NO. 106-140, at 10 (1999).

"other domain name authority that registered or assigned the domain name is located."[16]

More than a decade and a half after the passage of the ACPA, several factors make the ACPA worth revisiting today. October 2016 marked the historic handover of the Internet management system from the U.S. government to an independent organization called the Internet Corporation for Assigned Names and Numbers (ICANN).[17] Hailed as "the most significant change in the Internet's functioning for a generation,"[18] the move is the culmination of the past decade's shift toward a multilateral Internet governance system.[19] In recent years, the transfer had taken on a new sense of urgency after Edward Snowden's revelations of the U.S. intelligence community's interception of Internet traffic led to a "global uproar" from countries around the world.[20] The October 2016 handover gave ICANN complete independence and ownership over the Internet directory.[21] The transfer reflects a significant change in U.S. Internet policy,

16. 15 U.S.C. § 1125(d)(2)(A) (2012).

17. Klint Finley, *The Internet Finally Belongs to Everyone*, WIRED (Oct. 3, 2016, 12:09 PM), https://www.wired.com/2016/10/internet-finally-belongs-everyone.

18. Kieren McCarthy, *Internet Handover Is Go-Go-Go! ICANN to Take IANA From US Govt*, REGISTER (Sept. 30, 2016, 9:58 PM), http://www.theregister.co.uk/2016/09/30/internet_handover_is_go_go_go.

19. Since its inception, the Internet has long developed under the auspices of the U.S. government. Douglas A. Hass, *The Never-Was-Neutral Net and Why Informed End Users Can End the Net Neutrality Debates*, 22 BERKELEY TECH. L.J. 1565, 1576 (2007). It began as a Department of Defense project, which gave rise to the Internet Assigned Numbers Authority (IANA), the database that stores all Internet domain names. *Id.* at 1577. The Internet Corporation for Assigned Names and Numbers (ICANN) was created in 1998 to manage IANA, which it did under a contract with the Department of Commerce. *Id.* at 1576 n.55; Finley, *supra* note 17. In 2009, the Department of Commerce and ICANN signed an Affirmation of Commitments which declared ICANN to be an independent entity and brought the total transfer into sight. Lawrence E. Strickling & Rod Beckstrom, *Affirmation of Commitments by the United States Department of Commerce and the Internet Corporation for Assigned Names and Numbers*, INTERNET CORP. FOR ASSIGNED NAMES & NUMBERS (Sept. 30, 2009), https://www.icann.org/resources/pages/affirmation-of-commitments-2009-09-30-en. For an analysis of the Affirmation of Commitments and its significance, see A. Michael Froomkin, *Almost Free: An Analysis of ICANN's 'Affirmation of Commitments'*, 9 J. TELECOMM. & HIGH TECH. L. 187 (2011).

20. Edward Wyatt, *U.S. to Cede its Oversight of Addresses on Internet*, N.Y. TIMES (Mar. 14, 2014), http://www.nytimes.com/2014/03/15/technology/us-to-give-up-role-in-internet-domain-names.html. Brazil in particular strongly criticized U.S. control. *Id.*

21. Finley, *supra* note 17. In the United States, the handover generated renewed political attention and controversy. *See, e.g.*, Cecilia Kang & Jennifer Steinhauer, *Ted Cruz Fights Internet Directory's Transfer; Techies Say He Just Doesn't Get It*, N.Y. TIMES (Sept. 15, 2016), http://www.nytimes.com/2016/09/16/us/politics/ted-cruz-internet-domain-names-funding.html.

and calls for a reexamination of the ACPA's role as well as its consistency with modern policies.

ICANN's growth also offers new solutions for the problems that Congress attempted to address when it passed the ACPA. For example, in December 1999, ICANN implemented a dispute resolution mechanism called the Uniform Domain–Name Dispute Resolution Policy (UDRP), which offers remedies similar to those of the ACPA in a more internationalized setting.[22] Given the availability of the UDRP today and its advantages over the ACPA, the time is ripe to reexamine whether the ACPA is really needed.[23] In light of these changes and other developments in the domain name economy in the past decade,[24] this Note examines the legal and policy issues raised by the ACPA's expansion of in rem jurisdiction.

Legally, the ACPA fails to pass constitutional muster for several reasons.[25] First, the extraterritorial application of in rem actions to domain names registered abroad by a foreigner violates due process because the minimum contacts requirement established in *Shaffer v. Heitner*[26] is not met. Second, under the same circumstances, ACPA's in rem actions offend notions of adequate notice and service of process. Specifically, individuals outside the United States receive no notice that merely registering a domain name might expose their domain names to lawsuits in U.S. courts. Though some commentators have suggested that a domain name buyer would be aware of the nationality of the registrar from which she buys a domain name,[27] the growing complexity of the domain name market makes it

22. *Timeline for the Formulation and Implementation of the Uniform Domain-Name Dispute-Resolution Policy*, INTERNET CORP. FOR ASSIGNED NAMES & NUMBERS (Feb. 25, 2012), https://www.icann.org/resources/pages/schedule-2012-02-25-en.

23. *See infra* Part IV.C (identifying concerns that the ACPA not only competes with, but actively interferes with the operation of the UDRP and results in some litigants getting a second bite at the apple in domain name disputes).

24. In addition to the growing number and diversity of accredited registrars, new offerings in the domain name space have complicated its regulation. For example, ICANN's offering of new generic top–level domains (gTLDs) and the rise in registration by proxy both have implications for the ACPA, to be discussed *infra*, in Sections IV.A. and III.B, respectively.

25. Though this Note does not challenge the assumption that the ACPA is a proper exercise of congressional power. *See, e.g.*, Heather A. Forrest, *Drawing a Line in the Constitutional Sand Between Congress and the Foreign Citizen "Cybersquatter"*, 9 WM. & MARY BILL RTS. J. 461, 474 (2001) (arguing that Congress did not have authority under the Commerce Clause to pass the ACPA).

26. 433 U.S. 186 (1977).

27. *See* Catherine T. Struve & R. Polk Wagner, *Realspace Sovereigns in Cyberspace: Problems with the Anticybersquatting Consumer Protection Act*, 17 BERKELEY TECH. L.J.

difficult for buyers to identify every entity that is involved in the transaction and thus to which countries' laws the buyer's exposure extends. Third, the ACPA's definition of a domain name's situs (or legal location) as any one of multiple locations stretches even the legal fiction of a situs and is inconsistent with the prevailing approach to the situs in relation to other intangible property.

The legal issues with the ACPA reflect the policy failings behind its outdated vision of Internet governance. First, the ACPA's definition of domain name situs promotes a skewed governance structure that artificially places the majority of domain name disputes under the jurisdiction of a single U.S. judicial district. The ACPA defines the situs of a domain name as the location of multiple entities, including the registry (where records of domain ownership are kept) and the registrar (where the owner claimed the domain name).[28] Under this definition, the majority of all domains are considered to be located in the United States, and in particular the Eastern District of Virginia, where almost all major registries are located.[29] This definition is difficult to reconcile with an equitably and usefully divided governance framework, and will become untenable as Internet penetration abroad continues to increase. Second, the ACPA ignores the fact that trademark law is governed nationally, failing to account for the possibility that there might be legitimate foreign trademarks that would conflict with U.S. trademarks. By giving U.S. trademark holders a right of action in U.S. courts where the foreign interested party may be absent, the ACPA favors U.S. trademarks without attempting to reconcile them with other legitimate trademark claims. Third, continued U.S. reliance on the ACPA regime not only ignores the existence of viable alternatives like the UDRP,[30] but also interferes with the operation of those alternatives. As a result, the ACPA stymies efforts to govern Internet domain name disputes multilaterally.

Given the problems with the current ACPA regime, this Note proposes several ameliorative measures. First, it suggests an alternative conceptualization of domain name situs for the purposes of the ACPA's in rem jurisdiction. Rather than defining a website's situs to be the location of both the registrar and the registry, the situs should only be the location of

989, 1001 (2002) ("It seems likely that most registrants will be aware of the nationality of the dealer they use.").

28. 15 U.S.C. § 1125(d)(2)(C) (2012).

29. As discussed below, the Eastern District of Virginia is the judicial district for the registries that contain the records of the most common websites, including ".com" and ".net" websites. *See infra* Section IV.A.

30. *See Uniform Domain Name Dispute Resolution Policy*, INTERNET CORP. FOR ASSIGNED NAMES & NUMBERS, https://www.icann.org/resources/pages/help/dndr/udrp-en (last visited Aug. 20, 2017).

the registrar where the purchaser gained ownership of the domain name. Limiting the ACPA's applicability to domain names registered with a U.S. registrar would narrow the ACPA's reach to only foreign registrants who directly made contact with a U.S. entity. This approach would curtail the worst of the ACPA's overreach while preserving the statute's fundamental purpose of protecting U.S. trademark holders by avoiding the types of extraterritorial application that fail to satisfy the minimum contacts standard. Moreover, because registrar locations are distributed much more evenly across the world than registry locations, this method would provide a more equitable international division of authority over domain name disputes. Second, requiring domain name registrars to modify their contracts with purchasers to clarify the reach of different jurisdictions may ameliorate the lack of notice. This would be a good first step toward providing adequate notice to foreign domain name purchasers of their exposure to other countries' laws.

This Note proceeds as follows. Part II provides an overview of the domain name registration process and the ACPA. Part III parses the legal problems with the ACPA, focusing on its failure to meet the requirements of constitutional due process in certain extraterritorial applications, as well as the incoherence of its definition of domain name situses as multiple sites. Part IV examines the ACPA's policy failures in promulgating a U.S.–centric definition of the situs of the domain, disregarding foreign trademark regimes, and interfering with the operation of dispute resolution mechanisms available under a more multilateral effort. Part V offers several proposals to reform the ACPA, and Part VI concludes.

## II. DOMAIN NAME GOVERNANCE AND THE ACPA

### A. THE DOMAIN REGISTRATION PROCESS

The Internet Domain Name System (DNS) consists of a directory of all domain names and their corresponding computers, which are registered to the domain name owner.[31] When a person registers the domain name for a website, the domain name becomes associated with the designated computer from which the individual can create a website accessible to all Internet users.[32] Although ICANN manages the DNS system, ICANN has

31. *FAQs*, INTERNET CORP. FOR ASSIGNED NAMES & NUMBERS, https://www.icann.org/resources/pages/faqs-2014-01-21-en (last visited Aug. 20, 2017).

32. *Id.*

contracted with downstream entities, including registries and registrars, to manage the registration process.[33]

An individual begins the registration process at a domain name registrar. Registrars are dealers authorized by ICANN to sell domain name addresses to customers through web–based interfaces[34] such as "GoDaddy.com" and "NameCheap.com." On these dealer websites, the customer can search for a desired domain name and select among the available variations of that name. After selecting a domain name to purchase, the customer must provide personal information, including name, address, and phone number.[35] As required by ICANN, this information is registered with the WHOIS database, which contains the information of the registrant, or owner, for every single registered domain in the world.[36]

Once the purchaser pays for the domain name and provides the required personal information, the registrar submits the technical information to a central directory known as a registry.[37] The registry is the master database that contains the records of all registered domain names for a particular top–level domain (TLD).[38] Thus, there is one registry containing all domains for the ".com" websites, and another registry for all the ".edu" websites. As the holder of the authoritative set of records for a TLD, each registry provides other computers on the Internet with the information necessary to find the websites registered by domain buyers.[39]

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33. *Id.*

34. *ICANN-Accredited Registrars*, INTERNET CORP. FOR ASSIGNED NAMES & NUMBERS (Aug. 21, 2017), https://www.icann.org/registrar-reports/accredited-list.html.

35. *GoDaddy WHOIS Lookup*, GODADDY, https://www.godaddy.com/whois (last visited Aug. 20, 2017); *see History of WHOIS*, INTERNET CORP. FOR ASSIGNED NAMES & NUMBERS, http://whois.icann.org/en/history-whois (last updated July 2017). The WHOIS database is required by ICANN; all accredited registrars must publish the registrant's contact information along with domain creation and expiration dates. Daniel Gervais & Dashiell Renau, *The Future of United States Copyright Formalities: Why We Should Prioritize Recordation, and How To Do It*, 28 BERKELEY TECH. L.J. 1459, 1492 n.184 (2013).

36. INTERNET CORP., *supra* note 35. For a more detailed discussion of the WHOIS database and its privacy implications, see Kathryn Elliott, *The Who, What, Where, When, and Why of WHOIS: Privacy and Accuracy Concerns of the WHOIS Database*, 12 SMU SCI. & TECH. L. REV. 141 (2009).

37. INTERNET CORP., *supra* note 31.

38. The TLD is what comes after the period in any website name—for example, ".com" or ".net." Heather N. Mewes, *Memorandum of Understanding on the Generic Top-Level Domain Name Space of the Internet Domain Name System*, 13 BERKELEY TECH. L.J. 235, 236 (1998).

39. *DNS and WHOIS - How it Works*, INTERNET CORP. FOR ASSIGNED NAMES & NUMBERS, https://whois.icann.org/en/dns-and-whois-how-it-works (last updated July

Because the Internet domain name system is globalized, there are few differences between the process that a U.S. domain buyer and a foreign domain buyer go through to purchase a domain name. Foreign registrants, however, are more likely to use foreign–based registrars, whose interface may be customized to its home country's language, customs, and laws. Thus, the foreign registrant would likely purchase the domain from a foreign–based registrar, which would then transfer the information to a registry, which would most likely be located in the United States.

### B. THE ACPA

Congress passed the ACPA to protect consumers and businesses, promote online commerce, and prevent abusive cybersquatting behavior.[40] In fact, the Senate Report for the ACPA shows that Congress intended it to be "carefully and narrowly tailored . . . to extend only to cases where the plaintiff can demonstrate that the defendant registered, trafficked in, or used the offending domain name with bad faith intent to profit from the goodwill of a mark belonging to someone else."[41] Nevertheless, the in rem solution Congress proscribed has proven to be quite broad.

The ACPA allows a trademark holder to file an in rem action against a domain name if: (1) the domain name violates a mark registered with the Patent and Trademark Office, and (2) the court finds that the owner either is unable to obtain in personam jurisdiction over the would–be defendant, or was unable to find the would–be defendant through due diligence.[42] This due diligence involves sending notice to the postal and email addresses of the domain registrant and publishing the notice of action as directed by the court.[43] Together, the ACPA considers these steps to "constitute service of process."[44] The ACPA thus provides an in rem option for plaintiffs to proceed in cases where in personam jurisdiction is unavailable or the owner cannot be found.[45] The in rem action can be brought in the judicial district where the registrar, registry, or other domain name authority that registered

2017) ("Registries also maintain another vital system, the authoritative name servers, which hold the key to where a website is located.").

40. *See* S. REP. NO. 106-140, at 4 (1999).

41. *Id.* at 12–13.

42. *See* 15 U.S.C. § 1125(d)(2)(A) (2012).

43. *See id.*

44. 15 U.S.C. § 1125(d)(2)(B) (2012).

45. This has drawn criticism from trademark holders and domain name registrants outside the United States, who argue that enforcing judgments from courts that lack personal jurisdiction over would–be defendants upsets the balance between the interests of trademark holders and the interests of the Internet community. *See* Statement of Policy on the Management of Internet Names and Addresses, 63 Fed. Reg. 31741 (June 10, 1998).

or assigned the domain name is located.[46] For this purpose, the domain name's situs is defined as the judicial district in which any of these authorities is located. Alternatively, the situs can be defined as the judicial district where "documents sufficient to establish control and authority regarding the disposition of the registration and use of the domain name are deposited with the court."[47] Courts have understood registrar certificates to constitute such documents.[48]

The exclusive remedy under in rem actions is a court order for the cancellation of the domain name or its transfer to the owner of the U.S. trademark.[49] When lawsuits are filed and notifications of the complaints are sent to the relevant domain name registrar, registry, or other domain name authority, the registrar or registry must deposit with the court documents sufficient to establish the court's control and authority over the disposition of the registration and use of the domain name.[50] In addition, the registrar or registry must freeze the status of the domain name while lawsuits are pending, putting a hold on any transfers, suspensions, or modifications to the domain name except by the order of the court.[51]

## III. LEGAL ISSUES WITH THE ACPA

The legal problems posed by the ACPA are most acute when a foreigner purchases a domain name from a domain name registrar that operates entirely outside of the United States. Here, the foreign purchaser's interactions while buying and paying for the domain name are all with foreign entities: the purchaser visits a foreign website, agrees to a foreign contract, and pays foreign currency. Any interaction with the United States that might suggest notice occurs during the interaction between the foreign registrar and the U.S. registry, *after* the registrant has completed her part of the process.[52] In this hypothetical, the foreign buyer is therefore unaware

46. 15 U.S.C. § 1125(d)(2)(A) (2012).

47. 15 U.S.C. § 1125(d)(2)(C)(ii) (2012).

48. *See, e.g.*, Mattel, Inc. v. Barbie-Club.com, 310 F.3d 293, 296 (2d Cir. 2002) ("Under the ACPA, a registrar's certificate is understood to constitute a 'document[ ] sufficient to establish [a district court's] control and authority regarding . . . the use of the domain name.'"); FleetBoston Fin. Corp. v. FleetBostonFinancial.com, 138 F. Supp. 2d 121, 123 (D. Mass. 2001) (describing plaintiff's arrangement for the registration certificate to be transferred to the court under the procedures established by 15 U.S.C. § 1125(d)(2)(D)).

49. 15 U.S.C. § 1125(d)(2)(D)(i) (2012).

50. 15 U.S.C. § 1125(d)(2)(D)(i)(I) (2012).

51. 15 U.S.C. § 1125(d)(2)(D)(i)(II) (2012).

52. The court in *Mattel* referred to the legislative history for the ACPA to establish that Congress considered the "registry or registrar" to provide a "nexus" for the ACPA's

that her domain name purchase could become an issue in a U.S. court over a U.S. trademark. This type of extraterritorial application of the ACPA offends notions of due process both in the lack of minimum contacts for such foreign registrants and in providing inadequate notice of their exposure to U.S. laws.

It is worth noting the ACPA's requirement of bad faith was intended to provide a safe harbor and offer some protection for foreign domain name registrants act in good faith.[53] But this protection is insufficient for at least two reasons. First, the most fundamental legal deficiencies of the ACPA cannot be resolved even by the existence of actual bad faith. The inquiry of whether there was bad faith is a question of merit that can only be reached if the court has personal jurisdiction over the registrant to adjudicate such an issue in the first place. In the absence of such jurisdiction, it does not matter whether a bad faith finding would result. Violations of constitutional due process and adequate notice are procedural violations regardless of the putative bad faith of the domain name registrants.

Second, the ACPA in rem proceeding necessarily favors the plaintiff in making the bad faith determination given that the would–be defendant is absent. These consequences disproportionately affect foreign registrants because the ACPA allows the in rem lawsuits to reach not only evasive and hard–to–find registrants, but also registrants who are known but foreign.[54] In the latter instance, the resulting in rem suit amounts to an ex parte proceeding that sidesteps the known registrant in favor of one–sided arguments by the plaintiff. Especially given that determinations of bad faith turn on subjective intent, it is striking that this determination is made outside the presence of the person whose intentions are being evaluated.[55] Despite

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in rem jurisdiction, thereby satisfying the principles of due process. *Mattel*, 310 F.3d at 302; *see also* H.R. REP. NO. 106-412, at 14 (1999). This nexus, however, actually demonstrates the flaws of Congress's approach to due process—not only did it ignore *Shaffer*, but it also never considered registrars and registries separately despite the very large differences in the extent to which each is involved in the registration process.

53. 15 U.S.C. § 1125(d)(1)(B)(ii). This provision prevents the finding of bad faith where "the court determines that the person believed and had reasonable grounds to believe that the use of the domain name was a fair use or otherwise lawful." *Id.*

54. *See, e.g.*, Standing Stone Media, Inc. v. Indiancountrytoday.com, 193 F. Supp. 2d 528, 531 (N.D.N.Y. 2002) (describing how the plaintiff commenced the in rem action after learning that the would–be defendant "resides or claims to reside" in Canada).

55. *See* Adam Silberlight, *Domain Name Disputes Under the ACPA in the New Millennium: When Is Bad Faith Intent to Profit Really Bad Faith and Has Anything Changed with the ACPA's Inception?*, 13 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 269, 274 (2002) ("The mere registration of a domain that may be similar to a famous trademark name is insufficient for a showing of 'bad faith intent to profit' as required under the

the language of the safe harbor, which excuses domain name owners who reasonably believed their use was fair,[56] it is unclear who in the domain name owner's absence would make such a showing.

### A. LACK OF MINIMUM CONTACTS FOR FOREIGN REGISTRANTS

The ACPA provides in rem jurisdiction as a method of bypassing the lack of personal jurisdiction.[57] This approach violates the due process required by the Supreme Court in *Shaffer v. Heitner*, which held that the minimum contacts standard of *International Shoe Co. v. Washington* applies to in rem jurisdiction.[58]

Generally, courts may only exercise power over defendants over whom the court has personal jurisdiction. As the Supreme Court established in *Pennoyer v. Neff*,[59] traditionally, in personam jurisdiction exists if the defendant is domiciled in the forum, is present in the forum when served with process, or agrees to submit to the jurisdiction of the forum court.[60] Many decades later, the Court added to these traditional bases of in personam jurisdiction by articulating the minimum contacts test in *International Shoe*.[61] The *International Shoe* Court held that personal jurisdiction is proper if the defendant has "certain minimum contacts with [the forum] such that the maintenance of the suit does not offend traditional notions of fair play and substantial justice."[62] As a corollary, where the defendant lacks minimum contacts with the forum, personal jurisdiction cannot be extended without the consent of the defendant.[63]

In *Shaffer v. Heitner*, the Court extended the minimum contacts requirement of *International Shoe* to apply to in rem jurisdiction, holding that due process requirements are implicated even when the exercise of

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ACPA. Bad faith intent to profit requires that there be a standard used to determine the mental state of the registrant.").

56. 15 U.S.C. § 1125(d)(1)(B)(ii) (2012).

57. *See* Lucent Techs., Inc. v. Lucentsucks.com, 95 F.Supp.2d 528, 534 (E.D. Va. 2000) (holding that the ACPA intends "to provide a last resort where in personam jurisdiction is impossible, because the domain name registrant is foreign or anonymous").

58. Shaffer v. Heitner, 433 U.S. 186 (1977); Int'l Shoe Co. v. Washington, 326 U.S. 310 (1945).

59. Pennoyer v. Neff, 95 U.S. 714 (1877).

60. Richard Freer, *American and European Approaches to Personal Jurisdiction Based Upon Internet Activity* 2 (Emory Pub. Law Research Paper No. 07-15, 2007), https://ssrn.com/abstract=1004887.

61. *Int'l Shoe*, 326 U.S. at 310.

62. *Id.* at 316 (internal quotation marks omitted).

63. Freer, *supra* note 60, at 3 ("[A] relevant contact is *absolutely essential* to a finding of jurisdiction; all the 'fairness' in the world will not make up for a lack of such contact between the defendant and the forum.").

jurisdiction is over a thing rather than a person.[64] The *Shaffer* Court considered a quasi in rem Type II action,[65] where the plaintiff brought a shareholders' derivative suit for breach of duty in Delaware Chancery Court for conduct that occurred in Oregon.[66] The plaintiff filed a motion for the sequestration of the defendants' Delaware property. In response, the defendants entered a special appearance to suppress service of process, protesting that because they lacked sufficient contacts with Delaware, the sequestration order violated due process.[67]

In rejecting the plaintiff's claim of jurisdiction, the Court held that the minimum contacts analysis set out in *International Shoe* extended to in rem actions.[68] Reasoning that in rem jurisdiction is "a customary elliptical way of referring to jurisdiction over the interests of persons in a thing"[69] and finding that "an adverse judgment in rem directly affects the property owner by divesting him of his rights in the property,"[70] the *Shaffer* Court held that extending in rem jurisdiction in the absence of minimum contacts would violate due process.[71] The Court made it clear that the requirement of minimum contacts applied to in rem actions as well as the quasi in rem action at issue, concluding that "all assertions of state-court jurisdiction must be evaluated according to the standards set forth in *International Shoe* and its progeny."[72]

Applying *Shaffer* to the ACPA's in rem actions, it follows that minimum contacts are not met in the case of a foreign domain owner who purchased a domain name through a foreign registrar. In such a case, the entirety of the foreign domain owner's activities were conducted abroad and the owner would not have interacted with any U.S. entities because the purchase was

64. *Shaffer*, 433 U.S. at 216.

65. In a quasi in rem action, courts "may only affect a named defendant's interest in a specific named piece of property." *Quasi in rem*, LEGAL INFO. INST., https://www.law.cornell.edu/wex/quasi_in_rem (last visited Aug. 20, 2017). Quasi in rem actions can be conceptualized as a type of action sharing the characteristics of both in personam actions and in rem actions. *Id.* Quasi in rem type I actions involve the plaintiff's pre-existing interest in the named property. *Id.* In contrast, in quasi in rem type II actions, the plaintiff's claim is unrelated to the named property, which is applied to satisfy the plaintiff's claim if the plaintiff wins. *Id.* The action considered in *Shaffer* was quasi in rem type II. *See id.*

66. *Shaffer*, 433 U.S. at 186.

67. *Id.*

68. *Id.* at 216.

69. *Id.* at 207.

70. *Id.* at 206.

71. *Id.* at 216–17.

72. *Id.* at 212. Although this holding includes a reference to state courts, the holding likely applies to federal courts as well. *See* Struve & Wagner, *supra* note 27, at 1016.

made through a foreign–based registrar, which then transferred the information to a U.S. registry. Even if a foreign registrant had used a U.S. registrar, courts have found that this alone would not constitute minimum contacts.[73] Thus, the ACPA's provision of in rem jurisdiction where in personam jurisdiction is unavailable is a nullity: where in personam jurisdiction is unavailable, in rem jurisdiction is also unavailable, given that they both require minimum contacts.[74]

Although no court has yet invalidated the applicability of the ACPA on this ground, some courts have recognized that *Shaffer* does render some provisions of the ACPA null.[75] In *Ford Motor Co. v. Greatdomains.Com, Inc.*, a Michigan district court relied on *Shaffer* to reject the plaintiff's assertion of jurisdiction under 15 U.S.C. § 1125(d)(2)(C).[76] In that case, the plaintiff brought an ACPA in rem action in the Eastern District of Michigan, which was not the location of the registry, the registrar, or any other domain name authority. Instead, plaintiffs relied on § 1125(d)(2)(C), which defined the situs of a domain name as the location where "documents sufficient to establish control and authority regarding the disposition of the registration and use of the domain name are deposited with the court."[77] Because 15 U.S.C. § 1125(d)(2)(D)(i)(I) provides that, upon the filing of an ACPA complaint, registrars and registries must present documents sufficient to establish the court's control over the registration,[78] the statutory scheme seems to suggest that the situs of a domain name, and thus jurisdiction, can be granted to *any* court with which the ACPA complaint is filed simply by presenting such documents. The *Ford* court held that *Shaffer*'s constitutional due process requirements precluded such jurisdiction.[79]

73. *See* Panavision Int'l, L.P. v. Toeppen, 141 F.3d 1316, 1322 (9th Cir. 1998) (holding that registering a domain name, by itself, does not constitute minimum contacts); Banco Inverlat, S.A. v. www.inverlat.com, 112 F. Supp. 2d 521, 522 n.1 (E.D. Va. 2000) ("[I]t is established that the mere act of registering a disputed domain name with NSI in Virginia, as done here, is insufficient to subject a defendant to the personal jurisdiction of this Court.").

74. Struve & Wagner, *supra* note 27, at 1006.

75. *See, e.g.*, Ford Motor Co. v. Greatdomains.com, Inc., 177 F. Supp. 2d 656, 659 (E.D. Mich. 2001); *see also* Cable News Network L.P., v. CNNews.com, 162 F. Supp. 2d 484, 491 (E.D. Va. 2001) *aff'd in part, vacated in part sub nom*. Cable News Network, LP v. CNNews.com, 56 F. App'x 599 (4th Cir. 2003) (rejecting the argument that documents which establish control over the domain name are sufficient to vest jurisdiction and noting that "there is no constitutional basis for *in rem* jurisdiction when the adjudicating court merely has possession of the certificate of the domain name. . . .").

76. *Ford*, 177 F. Supp. 2d at 659.

77. 15 U.S.C. § 1125(d)(2)(C) (2012).

78. 15 U.S.C. § 1125(d)(2)(D)(i)(I) (2012).

79. *Ford*, 177 F. Supp. 2d at 659.

Pointing to *Shaffer*'s acknowledgment that in rem jurisdiction can be unavailable even in cases where property is related to the underlying claim if the property was brought into the forum "without the consent of the owner," the court held that an exercise of jurisdiction would violate due process.[80] It is not so difficult to imagine that *Shaffer* similarly affects other aspects of the ACPA, particularly its application to foreign registrants, in ways that the ACPA's drafters did not seem to recognize.[81]

Courts, however, have resisted applying *Shaffer* to the ACPA's in rem provision. *Cable News Network L.P. v. CNNews.com*[82] in the Eastern District of Virginia, and *Mattel, Inc. v. Barbie-Club.com*[83] in the Second Circuit are two such notable cases. These decisions offer three arguments justifying *Shaffer's* inapplicability: (1) that *Shaffer*'s minimum contact requirements are limited by Justice Scalia's opinion in *Burnham v. Superior Court*;[84] (2) that *Shaffer* only requires minimum contacts for in rem actions that are unrelated to the property in question; and (3) that *Shaffer*'s language about in rem actions is dicta and the holding only applies to quasi in rem type II actions.[85] None of these arguments withstand scrutiny.

The first argument is that Justice Scalia's opinion in *Burnham* limited the scope of *Shaffer* to only quasi in rem type II actions.[86] In *Cable News Network L.P. v. CNNews.com*, a Virginia district court rejected a challenge to ACPA jurisdiction by relying on *Burnham* and a series of lower court cases as "the greater weight of (and more persuasive) authority" that trumps *Shaffer*.[87] However, *Burnham* stands for a much narrower proposition than

80. *Id.*

81. *Shaffer* was decided before the passage of the ACPA, so the drafters of the ACPA had the opportunity to consider the constraints imposed by *Shaffer*, but they appear not to have done so. Relying on reasoning that directly contradicts the analysis in *Shaffer*, the House Committee report stated that the ACPA's in rem jurisdiction does not offend due process "since the property and only the property is the subject of the jurisdiction, not other substantive personal rights of any individual defendant." H.R. REP. NO. 106-412, at 14 (1999).

82. *Cable News Network*, 162 F. Supp. 2d at 491.

83. Mattel, Inc. v. Barbie-Club.com, 310 F.3d 293 (2d Cir. 2002).

84. Burnham v. Superior Court of Cal., 495 U.S. 604 (1990).

85. Struve & Wagner, *supra* note 27, at 1011–12.

86. A related argument that reaches the same result from a different path is that *Shaffer* only applies to quasi in rem type II actions because the other parts of *Shaffer* were dicta and need not be followed. That argument is addressed paragraphs below. *See supra* notes 105–11 and accompanying text.

87. *Cable News Network*, 162 F. Supp. 2d at 491.

*Shaffer* and its holding is not at odds with *Shaffer*—something that *Burnham* explicitly states several times.[88]

*Burnham* concerned personal jurisdiction over a defendant—a New Jersey resident—who was served with a court summons and divorce petition while he was physically present in California but otherwise lacked connections to the state.[89] Justice Scalia's opinion rejected the petitioner's argument that personal jurisdiction could not be extended to him in a suit unrelated to his activities in the state absent "continuous and systematic" contacts with California as required by *International Shoe*.[90] The opinion appears to take issue with *Shaffer*'s requirement that "all assertions of state-court jurisdiction must be evaluated according to" the standards of *International Shoe*, stating *Shaffer*'s holding narrowly as a requirement that "*quasi in rem* jurisdiction . . . must satisfy the litigation-relatedness requirement of *International Shoe*."[91] When read in context, it is apparent that this statement is meant only to carve out an exception for tag jurisdiction where the defendant *physically appears* in the forum.[92] The next sentence continues, "[t]he logic of *Shaffer*'s holding . . . does not compel the conclusion that physically present defendants must be treated identically to absent ones. . . . *International Shoe* confined its 'minimum contacts' requirement to situations in which the defendant 'be not present within the territory of the forum,' and nothing in *Shaffer* expands that requirement beyond that."[93] In short, to the extent that *Burnham* can be read to reject *Shaffer*, it does so only on the narrow ground of rejecting its applicability to tag jurisdiction, and *Burnham* otherwise leaves *Shaffer* untouched. Indeed, Justice Scalia is careful to state, several times, that "our holding today does not contradict *Shaffer*"[94] and that the court is "in no way receding from or casting doubt upon the holding of *Shaffer* or any other case."[95] Thus, the *CNN* court's rejection of *Shaffer*'s applicability to the ACPA based on *Burnham* is itself based on a misunderstanding of *Burnham*'s relationship to *Shaffer*.

In fact, Justice Scalia's reasoning in *Burnham* supports the idea that *International Shoe*'s minimum contact analysis must be met for the ACPA's

88. *See Burnham*, 495 U.S. at 622 (stating that the Court is "in no way receding from or casting doubt upon the holding of *Shaffer* or any other case").
89. *Id.* at 607–08.
90. *Id.* at 616–19.
91. *Id.* at 620–21.
92. *See* Struve & Wagner, *supra* note 27, at 1014.
93. *Burnham*, 495 U.S. at 621 (internal citations omitted).
94. *Id.*
95. *Id.* at 622.

in rem actions.[96] *Burnham* turned on the idea that tag jurisdiction is an age–old tradition that *Shaffer* was not meant to disturb.[97] *Burnham* recognized that "[f]or new procedures, hitherto unknown, the Due Process Clause requires analysis to determine whether 'traditional notions of fair play and substantial justice' have been offended."[98] Although in rem jurisdiction itself has a historical basis,[99] in rem jurisdiction over domain names constitutes an entirely novel procedure created by Congress, complete with a new conception of a domain name's situs. This is precisely the type of "hitherto unknown" procedure for which *Burnham* would require *International Shoe*'s minimum contacts analysis.[100]

A second argument against the applicability of *Shaffer* to the ACPA is that *Shaffer* does not require minimum contacts for actions that are related to the property in question. The Eastern District of Virginia[101] and the Second Circuit[102] have both relied on this reasoning to find that minimum contacts are not required for the ACPA's in rem proceedings. This also seems to have been the rationale of the ACPA drafters, who believed that the ACPA's in rem action would not offend due process because it would only affect the property in question.[103] In *Mattel*, the Second Circuit relied on *Shaffer*'s observation that, where claims to the property are the source of the controversy at issue, "it would be unusual for the State where the

96. Struve & Wagner, *supra* note 27, at 1014.

97. *See Burnham*, 495 U.S. at 622 ("But a doctrine of personal jurisdiction that dates back to the adoption of the Fourteenth Amendment and is still generally observed unquestionably meets that standard.").

98. *Id.*

99. *See* Morris E. Cohn, *Jurisdiction in Actions In Rem and In Personam*, 14 ST. LOUIS L. REV. 170, 175 (1929) ("The generally accepted view is that actions *in rem* started in Roman Law and were taken over into the common law from jurisprudence.").

100. Struve & Wagner, *supra* note 27, at 1014.

101. *See* Caesars World, Inc. v. Caesars-Palace.com, 112 F. Supp. 2d 502 (E.D. Va. 2000).

102. *See* Mattel, Inc. v. Barbie-Club.com, 310 F.3d 293 (2d Cir. 2002).

103. The House Committee report stated that the ACPA's in rem jurisdiction does not offend due process "since the property and only the property is the subject of the jurisdiction, not other substantive personal rights of any individual defendant." H.R. REP. NO. 106–412, at 14 (1999). Indeed, the *Mattel* court relies on this legislative history to suggest that, because Congress conceived the ACPA's in rem jurisdiction as requiring "few if any due process concerns," it must be true that in rem actions do not pose any due process issues. *Mattel*, 310 F.3d at 302–03. However, Congress does not have the power to declare that a judicial process comports with due process requirements simply by fiat. *See, e.g.*, Marbury v. Madison, 5 U.S. (1 Cranch) 137, 177 ("[I]t is emphatically the province and duty of the judicial department to say what the law is").

property is located not to have jurisdiction."[104] The *Shaffer* Court suggests that in such cases, "the defendant's claim to the property located in the State would normally indicate that he expected to benefit from the State's protection of his interest," thus establishing the necessary sufficient contacts.[105]

*Mattel*'s reliance on this observation, however, ignores *Shaffer*'s explicit limitation. In a footnote, the *Shaffer* Court recognizes that there are certain circumstances in which "the presence of property in the forum State will not support the inference suggested in text," including if the property was brought into the state by fraud, or for the purposes of litigation, or without the consent of the owner.[106] This is exactly the case with the ACPA's extraterritorial application. Arguably, the domain name is "taken to" the U.S. registry from a foreign registrar without the domain name owner's knowledge or consent. Thus, in these circumstances, the domain name's presence in the forum does not mean that the domain name owner intended to benefit from the forum state's protection. There can be no intention to benefit from the laws of the United States on the part of a foreign domain name buyer who does not even know that the registry for her domain name is located there.[107] The ACPA as applied to foreign registrants is exactly the "unusual" circumstance recognized by *Shaffer* where minimum contacts do not exist even though the foreign registrant's property, the domain name, is deemed to have its situs in the forum.

Third is the argument that *Shaffer*'s language about in rem actions is dicta[108] and thus non–binding. The *CNN* court took this approach, finding

104. *Mattel*, 310 F.3d at 302–03 (quoting Shaffer v. Heitner, 433 U.S. 186, 207 (1977)).

105. *Shaffer*, 433 U.S. at 207–08.

106. *Id.* at 208 n.25 (citing comments in the Second Restatement of the Conflict of Laws noting several situations in which a forum may not exercise jurisdiction over chattels present in its jurisdiction); *see* RESTATEMENT (SECOND) OF CONFLICT OF LAWS § 60(c)–(d) (AM. LAW INST. 1971).

107. This is where the *Caesars World* court errs by deciding—without providing support—that domain registration is sufficient to satisfy the constitutional requirement of minimum contacts. *See* Caesars World, Inc. v. Caesars-Palace.com, 112 F. Supp. 2d 502, 504 (E.D. Va. 2000). *But see* Panavision Int'l, L.P. v. Toeppen, 141 F.3d 1316, 1322 (9th Cir. 1998) (holding that "simply registering someone else's trademark as a domain name," by itself, does not constitute minimum contacts); Banco Inverlat, S.A. v. www.inverlat.com, 112 F. Supp. 2d 521, 522 n.1 (E.D. Va. 2000) ("[I]t is established that the mere act of registering a disputed domain name with NSI in Virginia, as done here, is insufficient to subject a defendant to the personal jurisdiction of this Court.").

108. Although there is no precise definition of what dictum is, Black's Law Dictionary defines it as "[a] judicial comment made while delivering a judicial opinion, but one that

that *Shaffer*'s position on true in rem and quasi in rem type I "was unnecessary to the holding and is therefore non-binding dicta."[109] This, however, is incorrect. *Shaffer* stands not only for the result it reaches but also the reasoning it applies to reach that result.[110] In *Shaffer*, that includes the reasoning that jurisdiction over property is really jurisdiction over the interest of persons in the property.[111] Analytically, this reasoning applies to all types of in rem actions, and *Shaffer* itself makes no distinction between the different types of in rem actions. The bar for a lower court to dismiss a higher court's reasoning as mere dicta is extremely high,[112] and the *CNN* court's decision does not even approach it.[113] Moreover, even if the requirements were dicta, many courts believe that the Supreme Court's dicta nevertheless "must be respected."[114] Thus, the *CNN* court's dismissal of *Shaffer*'s position on in rem actions as dicta is without merit. Given the applicability of *Shaffer*, the ACPA is unconstitutional as applied to certain types of foreign registrants.

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is unnecessary to the decision in the case and therefore not precedential." *Dictum*, BLACK'S LAW DICTIONARY 1102 (8th ed. 2004).

109. Cable News Network L.P. v. CNNews.com, 162 F. Supp. 2d 484, 491 (E.D. Va. 2001), *aff'd in part, vacated in part sub nom.* Cable News Network, LP v. CNNews.com, 56 F. App'x 599 (4th Cir. 2003). The court stated that "despite the *Shaffer* decision, it remains generally accepted that" courts routinely exercise jurisdiction when the property is within the forum state without conducting a minimum contacts analysis. *Id.* (citing only to a law review article for supporting authority). Finally, the court rejected *Shaffer*'s application of minimum contacts to all in rem cases as "counter to historical practice and common sense" without explaining why the court believed a Supreme Court decision would not be able to change historical practice. *Id.*

110. This is particularly true for the Supreme Court, which scholars have recognized has a function to decide cases that "involve[] principles, the application of which are of wide public or governmental interest, and which should be authoritatively declared by the final court." William Howard Taft, *The Jurisdiction of the Supreme Court Under the Act of February 13, 1925*, 35 YALE L.J. 1, 2–3 (1925).

111. Shaffer v. Heitner, 433 U.S. 186, 207 (1977).

112. The bar is so high that federal courts of appeals invoke the distinction meaningfully in approximately 1 in 4000 cases, while federal district courts do so in approximately 1 in 2000 cases. David Klein & Neal Devins, *Dicta, Schmicta: Theory Versus Practice in Lower Court Decision Making*, 54 WM. & MARY L. REV. 2021 (2013).

113. *See* Struve & Wagner, *supra* note 27, at 1013 ("When the Supreme Court articulates a general principle of constitutional doctrine, and especially when the Court takes pains, as it did in *Shaffer*, to assess the implications of that principle for contexts other than that of the case at hand, lower courts should be slow to brush the principle aside as mere 'dictum.'").

114. *See, e.g.,* Wisconsin Right to Life, Inc. v. Barland, 751 F.3d 804, 836 (7th Cir. 2014) ("Still, the Supreme Court's dicta must be respected.").

### B. INADEQUATE NOTICE TO FOREIGN REGISTRANTS

The ACPA's interpretation of what "constitute[s] service of process"[115] fails to provide adequate notice, particularly for foreign registrants. Although the ACPA's in rem action is technically a claim against the domain name itself and not against any person, it nevertheless affects the domain name owner's interest in the domain name.[116] Recognizing this, *Shaffer* affirmed that "property cannot be subjected to a court's judgment unless reasonable and appropriate efforts have been made to give the property owners actual notice of the action."[117] Given that a successful ACPA in rem action essentially takes away the registrant's property, some amount of notice is required.

Notice under the ACPA is limited for unknown registrants and nonexistent for known foreign registrants. The ACPA provides "[t]he actions under subparagraph (A)(ii) shall constitute service of process."[118] Subparagraph (A)(ii) is divided into two parts, (A)(ii)(I) and (A)(ii)(II). Part (A)(ii)(I) governs situations where personal jurisdiction is not available over the domain name owner and does not specify any action to provide notice. Part (A)(ii)(II) governs situations where the plaintiff is unable to locate the owner and provides instructions to send notice to the email and postal addresses provided in the WHOIS database, and to publish a notice of the action as directed by the court.[119] The separation of the subparagraphs into two distinct scenarios, each with its own necessary actions, suggests that in the case of foreign domain name owners over whom no personal jurisdiction exists, the ACPA does not require any action to constitute service of process. In the case of the missing domain owner, attempts to make contact through the email and postal addresses provided by the registrar constitute service of process.[120] Courts have suggested that the minimum waiting period before filing an in rem action can be as short as

115. 15 U.S.C. § 1125(d)(2)(B) (2012).

116. *See Shaffer*, 433 U.S. at 207–08.

117. *Id.* at 206; *see also* CompuServ, Inc. v. Patterson, 89 F.3d 1257, 1262 (6th Cir. 1996) (holding that due process requires potential defendants be able to "structure their primary conduct with some minimum assurance as to where the conduct will and will not render them liable to suit.") (quoting World-Wide Volkswagen Corp. v. Woodson, 444 U.S. 286, 297 (1980)).

118. 15 U.S.C. § 1125(d)(2)(B) (2012).

119. 15 U.S.C. § 1125(d)(2)(A)(ii)(II) (2012).

120. *Id.*

ten days.[121] Notice by publication is permitted at the discretion of the court,[122] but it is not likely to be helpful if the missing owner is a foreign registrant. Especially given the growing popularity of private and proxy registration services, where a third–party business listing shields the true domain name holder on WHOIS,[123] the ACPA's conception of notice is even less adequate today than when it was enacted.

### C. INCOHERENT DEFINITION OF MULTIPLE DOMAIN NAME SITUSES

The ACPA defines a domain name's situs as the location of its registrar, registry, or other domain name authority.[124] This formulation is inconsistent with the treatment of other intangible property because the registry has no effective control over domain names. In addition, the ACPA's allowance for multiple definitions of situs for one domain name is incoherent given that the registrar and the registry are often located in entirely different locations.

A domain name can be thought of as a piece of data or code that represents a piece of property in cyberspace.[125] Thus, a domain name may

121. Lucent Techs., Inc. v. Lucentsucks.com, 95 F.Supp.2d 528, 533 (E.D. Va. 2000) (suggesting that a waiting period of eight days was not enough to demonstrate due diligence, but that ten days may be the appropriate minimum length).

122. For example, in *Banco Inverlat, S.A. v. www.inverlat.com*, the court exercised its discretion to waive service by publication. 112 F. Supp. 2d 521, 523 (E.D. Va. 2000); *see also* Andrew J. Grotto, *Due Process and In Rem Jurisdiction Under the Anti-Cybersquatting Consumer Protection Act*, 2 COLUM. SCI. & TECH. L. REV. 1, 19 (2001).

123. *See, e.g.*, *Public vs. Private*, DOMAINS BY PROXY, https://www.domainsbyproxy.com/PublicVsPrivate.aspx (last visited Aug. 20, 2017). In fact, the contract for Domains by Proxy provides for the registrant to authorize Domains by Proxy to either resolve third-party claims or to cancel the service when a legal issue arises out of the domain name. *Domain Name Proxy Agreement*, DOMAINS BY PROXY, https://www.domainsbyproxy.com/policy/ShowDoc.aspx?pageid=domain_nameproxy (last revised June 28, 2017).

124. The phrase "other domain name authority" is undefined and otherwise unclear. ROBERT A. BADGLEY, DOMAIN NAME DISPUTES § 4.05, 4-26.3 (2002). For the purposes of this discussion, this Note only considers registrars and registries as potential situses. Courts have debated whether ICANN can be a "domain name authority," which would potentially pull all ACPA in rem actions to California, where ICANN is located. *See, e.g.*, Patrick M. Phelan, *District Court: ICANN Not a Domain Name Authority for In Rem Jurisdiction Under the ACPA*, INSIDE TECH MEDIA (Sept. 14, 2012) https://www.insidetechmedia.com/2012/09/14/district-court-icann-not-a-domain-name-authority-for-in-rem-jurisdiction-under-the-acpa.

125. There is some debate about whether a domain name may count as property at all; some argue that a domain name is merely a contractual right. *See* Ned Snow, *The Constitutional Failing of the Anticybersquatting Act*, 41 WILLAMETTE L. REV. 1, 47–48 (2005); *see also* David Post, *Are Internet Domain Names "Property"?*, WASH. POST: VOLOKH CONSPIRACY (Aug. 1, 2014), http://www.washingtonpost.com/news/volokh-conspiracy/wp/2014/08/01/are-internet-domain-names-property. Consistent with the

be considered a piece of intangible property.[126] There are several approaches to locating intangible property. One approach is the domicile–based approach. For some intangible property, such as corporate stock,[127] the general rule is that its situs is located where its owner is domiciled.[128] The ACPA clearly does not comport with this approach: the registrar and the registry have no consistent connection to the location where the owner of the domain name is domiciled.[129] The domicile–based approach does not make sense for domain names given that they are neither portable nor dependent on the location of their owners; in fact, domain names may not undergo any changes even when their ownership changes.

Another approach to locating intangible property is the control–based approach, which forms the "overarching principle"[130] dominating Supreme Court and lower court cases. Under this approach, the situs is the location of the entity that has control and dominion over the intangible property. This appears to be the ACPA's conception of situs. The ACPA locates the situs in the judicial district of the entity "that registered or assigned the domain name,"[131] which suggests that control over the domain name is the idea at play.[132] The other situs defined by the ACPA is even more explicit about control: the judicial district of the court where "documents sufficient to establish control and authority regarding the disposition of the registration

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ACPA's construction of domain names and the majority of courts who have considered the question following the passage of the ACPA, this Note treats domain names as property. *See* Sadasivan, *supra* note 14, at 241.

126. *See* Kremen v. Cohen, 337 F.3d 1024, 1029 (9th Cir. 2003) (finding that domain names are intangible property); *see also* Daniel Hancock, *You Can Have It, But Can You Hold It?: Treating Domain Names as Tangible Property*, 99 KY. L.J. 185, 186 (2011).

127. 84 C.J.S. *Taxation* § 170 (2016) ("Thus, the situs of shares of stock is ordinarily at the domicile of the owner or the corporation.").

128. *See* GP Credit Co. v. Orlando Residence, Ltd., 349 F.3d 976, 979 (7th Cir. 2003) ("The general rule is that [situs of] intangible personal property is 'located' in its owner's domicile."); *see also In re* Lambert, 179 F.3d 281, 285 (5th Cir. 1999) (same).

129. One of the more attractive features of defining the situs as the registrar rather than the registry, however, is that there is a better chance that the location of the registrar is the location of the registrant's domicile.

130. Thomas R. Lee, *In Rem Jurisdiction in Cyberspace*, 75 WASH. L. REV. 97, 126–27 (2000).

131. 15 U.S.C. § 1125(d)(2)(C)(i) (2012).

132. In fact, this is consistent with the conventional way of defining the situses of intangibles like copyright, trademarks, and patents as the location where they are registered.

and use of the domain name are deposited."[133] Thus, the ACPA appears to espouse the control–based approach to intangible property.

However, the ACPA's definition of a domain name's situs fails to follow through with the control–based approach. Given that the situs of a domain name should be the location of the entity exercising control over it, the situs should exclusively be the location of the registrar, which has effective control over the domain name. Under ICANN's structure, changes to domain name ownership, including cancellations and transfers, are handled by the registrars, as provided in their accreditation contract with ICANN.[134]

The registry, on the other hand, has no control over domain names because it is only a database that contains records of all domain names. Some argue that the registry has control over domain names because it "holds" them in the same sense that "an issuing corporation holds stock, an insurance company holds an insurance policy, or a financial institution holds an account or fund."[135] However, this argument muddles the distinction between "holding" something and having effective control over the issuance of the property. Corporations, insurance companies, and financial institutions are all entities responsible for issuing and managing the intangible property they hold. In contrast, registries are merely holders of lists. Indeed, courts appear to turn exclusively to registrars to effectuate their orders regarding domain names. Even if the registrar is foreign, courts request enforcement of their ACPA decisions with the foreign registrar rather than the U.S. registry.[136] In addition, rogue registrars have been able to prevent enforcement of domain name decisions by refusing to implement the ordered transfers.[137] This demonstrates that registry control over domain names is largely theoretical; in practice, the registrars control the domain

133. 15 U.S.C. § 1125(d)(2)(C)(ii) (2012). Courts have consistently interpreted the ACPA narrowly to disallow jurisdiction stemming solely from the relevant documents having been deposited in a particular jurisdiction. *See* Sadasivan, *supra* note 14, at 245.

134. *See* INTERNET CORP., *supra* note 30.

135. Lee, *supra* note 130, at 130.

136. For example, in *CNN* the U.S. District Court for the Eastern District of Virginia requested that the Chinese registrar of the domain name at issue transfer the domain name certificate to the court, despite the fact that the domain name was a ".com" domain and the registry was also based in the Eastern District of Virginia. Cable News Network L.P. v. CNNews.com, 162 F. Supp. 2d 484, 492 (E.D. Va. 2001), *aff'd in part, vacated in part sub nom.* Cable News Network, LP v. CNNews.com, 56 F. App'x 599 (4th Cir. 2003).

137. *See* Sarah B. Deutsch & David E. Weslow, *UDRP Hijacking Revisited: A Domain Name Registrar's Actions Raise Concerns*, INT'L TRADEMARK ASS'N BULL. (Oct. 1, 2011), http://www.inta.org/INTABulletin/Pages/UDRPHijackingRevisitedADomainNameRegistrar%E2%80%99sActionsRaiseConcerns.aspx.

names. Furthermore, it is the registrar that possesses the certificate establishing the domain name registration,[138] which places the registrar squarely within the ACPA's second definition of a situs—the location of "documents sufficient to establish control and authority regarding the disposition of the registration."[139] Accordingly, the appropriate situs for domain names should only be the location of the registrar, and not the registry.

Moreover, the ACPA's practice of allowing multiple situses for each individual domain name is conceptually incoherent. The locations of the registry and the registrar are often different,[140] and it is not clear which would be the domain name's true situs in such cases.[141] It is possible that the drafters of the ACPA wanted to provide an expansive allowance so that if any of these locations are in the United States, then the ACPA can apply to the domain name. However, locating a piece of intangible property in multiple locations is untenable in the context of disputes in other areas that may arise over domain names, for which the specific location of their situses may become important.

## IV. POLICY ISSUES WITH THE ACPA

The ACPA reflects an outdated vision of the Internet as a space governable by the unilateral actions of individual states. In the early days of the Internet, the Department of Commerce set out plans to facilitate global participation in its management.[142] However, in bringing the majority of authority over the domain name space to one judicial district within the United States, the ACPA does not facilitate a practical or equitable distribution of domain names. Especially given the October 2016 handover to ICANN, such a system is not only undesirable as a matter of policy but

138. *See, e.g.*, Mattel, Inc. v. Barbie-Club.com, 310 F.3d 293, 296 (2d Cir. 2002) (describing the registrar's submission of the registrar's certificates to the court).

139. 15 U.S.C. § 1125(d)(2)(C)(ii) (2012).

140. *See* INTERNET CORP., *supra* note 34.

141. As an analogy, it has long been considered a puzzle of personal jurisdiction that the Internet allows a person to be found in multiple locations; for example, whether a user's location should be considered where the user's computer resides, or where the computer directly linking to the Internet is located. *See* Siddiqi, *supra* note 1, at 50.

142. *See* U.S. PATENT & TRADEMARK OFFICE, U.S. DEP'T OF COMMERCE, REPORT TO CONGRESS: THE ANTICYBERSQUATTING CONSUMER PROTECTION ACT OF 1999, SECTION 3006 CONCERNING THE ABUSIVE REGISTRATION OF DOMAIN NAMES (2001), http://www.uspto.gov/web/offices/dcom/olia/tmcybpiracy/repcongress.pdf [hereinafter REPORT TO CONGRESS].

also likely to become untenable as more countries seek to exert influence over the Internet.

### A. CONCENTRATED ALLOCATION OF DOMAIN NAME DISPUTES TO ONE COURT

The ACPA's definition of domain situs funnels a disproportionate number of domain name disputes into the Eastern District of Virginia. The ACPA sets a domain's situs at the location of either the registrar or the registry. Almost all of the major registries are located in the United States. As shown in Table 1, the registries for most of the classic top–level domains (TLDs)—which dominate the Internet—are located in U.S. jurisdictions. At the close of the second quarter of 2016, there were a total of 334.6 million domain names registered across all TLDs.[143] Of these, ".com" names accounted for 127.5 million, while ".net" names accounted for 15.8 million.[144] In addition, ".org" domain names numbered 10.5 million as of October 2015.[145] Together, these three TLDs account for about forty–six percent of all domain names, and these registries are all located in the Eastern District of Virginia. In addition to the sheer number of domains they possess, ".com" and ".org" are disproportionately likely to be the subjects of domain name disputes because they are also the most often used,[146] making it even more disproportionately likely that any given domain name dispute will have to be brought in the Eastern District of Virginia.

**Table 1. Distribution of Major Registries**

| Top–level domain | Registry | Judicial District | Percent of total domain names[147] |
|---|---|---|---|
| **.com** | Verisign[148] | E.D. Va. | 38.1% |

143. *Domain Name Industry Brief*, VERISIGN, Sept. 2016, at 2, http://www.verisign.com/assets/domain-name-report-sept2016.pdf.

144. *Id.*

145. Press Release, Your Public Interest Registry, Report: Nonprofit Domains Gain Traction Worldwide (Oct. 14, 2015), http://pir.org/report-nonprofit-domains-gain-traction-worldwide.

146. Both are the TLDs with the most and second most page results in Google, respectively. Bill Slawski, *Google's Most Popular and Least Popular Top Level Domains*, SEO BY THE SEA (Jan. 13, 2006), http://www.seobythesea.com/2006/01/googles-most-popular-and-least-popular-top-level-domains.

147. These are approximate percentages calculated by dividing the total number of domain names by the number of domain names of a certain TLD. They are approximate because the dates for the numbers do not match up perfectly, with different registries releasing information about their domain name numbers at slightly different times.

148. VERISIGN, http://www.verisign.com (last visited Aug. 20, 2017).

| | | | |
|---|---|---|---|
| **.net** | Verisign | E.D. Va. | 4.7% |
| **.org** | Public Interest Registry[149] | E.D. Va. | 3.1% |

In contrast, registrars are much more numerous and spread out all over the world. As of October 2016, there were 2144 registrars accredited by ICANN.[150] Based on my analysis of ICANN's accredited registrars list, 69 countries had an accredited registrar. In addition, as shown in Table 2, the distribution of registrars in non–U.S. countries is a more accurate reflection of the populations and economies of countries than the distribution of registry locations.

**Table 2. Distribution of Registrars [151]**

| Country | Number of Registrars |
|---|---|
| United States | 1653 |
| China | 83 |
| India | 64 |
| Hong Kong | 35 |
| Germany | 27 |
| United Kingdom | 24 |
| Canada | 21 |
| Australia | 18 |
| France | 18 |
| Japan | 18 |
| South Korea | 16 |
| Netherlands | 14 |
| Spain | 13 |
| Russia | 9 |
| Italy | 8 |
| Sweden | 8 |
| Turkey | 8 |

149. YOUR PUBLIC INTEREST REGISTRY, http://pir.org (last visited Aug. 20, 2017).

150. The total is based on an analysis of the list of registrars on the ICANN website. *See* INTERNET CORP., *supra* note 34. The number of accredited registrars continues to grow rather dramatically; as of November 2014, there had been only 1,160 registrars on the list. *Id.*

151. *Id.*

| | |
|---|---|
| Vietnam | 6 |
| Ireland | 5 |
| Panama | 5 |
| Switzerland | 5 |
| United Arab Emirates | 5 |
| Other (47 countries)[152] | 81 |
| Total | 2144 |

There are both equitable and practical reasons to spread geographical jurisdiction over domain names. Equitably, it does not necessarily make sense for domain name disputes to end up primarily in the United States, nor for the Eastern District of Virginia to be made "the global tribunal," adjudicating the substantive rights of foreign registrants who have no contact with the district.[153] Confining so many domain name disputes to one district may be inconvenient not only for the would–be defendant but also the plaintiff in a given dispute, neither of whom are likely to reside in the Eastern District of Virginia. As a practical matter, as the volume of disputes over domain names increases,[154] the Eastern District of Virginia may be overwhelmed by the number of cases.

One potential argument in defense of concentrating domain name cases in one court is that it could lead to gains in efficiency and consistency that result from such specialization; for example, the Federal Circuit is tasked with patent appeals to promote uniformity in patent law. The comparison with specialized courts, however, is inapt for two reasons. First, the concentration of domain name cases in the Eastern District of Virginia was not planned, but inadvertent. As a result, any subject matter specialization is incomplete. The Eastern District is not a specialized court. The occasional case might still end up in other districts, undermining the goal of promoting consistency by creating outlier cases decided by a different court than the rest. Second, the concentration of cases within a single district court implicates international concerns that are simply not present in the case of specialized domestic courts like the Federal Circuit. These considerations

152. The breakdown is as follows: four countries with four registrars, seven countries with three registrars, eight countries with two registrars, and twenty–eight countries with one registrar.

153. *See* Xuan-Thao N. Nguyen, *The Digital Trademark Right: A Troubling New Extraterritorial Reach of United States Law*, 81 N.C. L. REV. 483, 534 (2003).

154. *See Domain Name Wars*, *supra* note 3.

outweigh any potential efficiencies of the current system. Cases should instead be distributed more evenly, both within the United States as well as globally.

Furthermore, ICANN's new program to expand generic top–level domains (gTLDs) could exacerbate the concentration problem. Whereas ICANN previously allowed only a limited number of TLDs,[155] it recently began a program that grants new gTLDs.[156] For example, New York City has proposed and developed the new ".nyc" gTLD, to be used by people and businesses located in New York City.[157] It remains an open question whether the ACPA could be used for disputes over the names of the gTLDs: for example, if Macy's wanted to challenge the registration of a gTLD of ".macys" by another party, could it do so under the ACPA? And if it can, because ICANN is the body that directly oversees the acceptance of new TLDs,[158] at least one court has contemplated that ICANN would be the "other domain name authority that registered or assigned the domain name"[159] where the domain name's situs would be assigned.[160] Because no registrars or registries are involved in the TLD process, the location of ICANN would be the only possible situs for the TLD.[161] If ICANN is recognized as a domain name authority, then the Central District of California would become the sole site of all disputes arising out of TLD names under the ACPA and any other laws that follow its definition of domain name situs.[162] Moreover, unlike the current situation with registrar and registries, both of which increase in number every year, there is only

155. Daniela Michele Spencer, *Much Ado About Nothing: ICANN's New GTLDs*, 29 BERKELEY TECH. L.J. 865, 869 (2014).

156. *About the Program*, INTERNET CORP. FOR ASSIGNED NAMES & NUMBERS, http://newgtlds.icann.org/en/about/program (last visited Aug. 20, 2017). For a more detailed examination of gTLDs and a critique of their potentially anticompetitive effects, see Spencer, *supra* note 155. For an analysis of the application process, see Nafees Uddin, *Stymieing Controversy Over Generic Top-Level Domains (gTLDs) and Other Internet Governance Decisions with Content Neutrality*, 11 SEATTLE J. FOR SOC. JUST. 813, 826 (2013).

157. *See* .NYC, http://www.ownit.nyc (last visited Aug. 20, 2017).

158. *See* INTERNET CORP., *supra* note 156 (describing ICANN's approval process for new gTLDs); Del Monte Int'l GmbH v. Del Monte Corp., 995 F. Supp. 2d 1107, 1120 (C.D. Cal. 2014) (recognizing that ICANN acts in a "hands-on" manner with respect to assigning new gTLDs).

159. 15 U.S.C. § 1125(d)(2)(A) (2012).

160. *See* Vizer v. VIZERNEWS.COM, 869 F. Supp. 2d 75, 77 (D.D.C. 2012) (quoting 15 U.S.C. § 1125(d)(2)(A)).

161. However, not all courts agree. In *Del Monte*, the court rejected the idea that a TLD can be a domain name, and ICANN a domain name authority, within the meaning of the ACPA. *Del Monte*, 995 F. Supp. 2d at 1120.

162. *Id.* at 1120, 1124.

one ICANN, and there would be no possibility that jurisdiction would expand over time to a greater number of courts. Thus, any potential expansion of the ACPA to cover TLDs would further exacerbate preexisting inequalities in the distribution of domain name authority.

### B. UNRESOLVED CONFLICT BETWEEN U.S. TRADEMARKS AND FOREIGN TRADEMARKS

The ACPA fails to recognize foreign trademarks in a manner consistent with international comity. Trademark law remains an area governed nationally[163] under vastly different regulatory regimes.[164] Whereas trademark law allows identical marks to operate in non–competing markets, the domain name system in effect allows only one of those trademark holders to lay a legitimate claim over the associated domain name.[165]

Within such a system, the ACPA privileges U.S. trademarks over those of other nations and "establish[es] U.S. trademark law as the law of the Internet."[166] Trademarks registered in other countries are not enforceable under the ACPA,[167] and the ACPA does not provide for the possibility that a legitimate claim by a U.S. trademark holder over a particular domain name may conflict with a legitimate claim by a foreign trademark holder over the same domain name.[168] The ACPA thus privileges the claims of U.S.

163. Trademark rights in general are granted in a specific geographical area and are not enforceable beyond that area. Thus, they are not enforceable internationally unless the party obtains protection in other countries as well. Ramirez, *supra* note 2, at 416.

164. Sadasivan, *supra* note 14, at 255. Unlike the United States, which has a system in which the first to *use* the mark in a particular geographical area obtains rights, most other countries employ a system in which the first to *register* the mark obtains rights. *Id.* Although the Madrid System for international registration of trademarks allows for the filing of trademarks simultaneously, it is not a substantive harmonization treaty but is rather an efficient way for trademarks to be filed in different countries with one application. *Madrid Protocol*, U.S. PAT. & TRADEMARK OFF., http://www.uspto.gov/trademark/laws-regulations/madrid-protocol (last visited Aug. 20, 2017).

165. Ramirez, *supra* note 2, at 415.

166. *See* Statement of Policy on the Management of Internet Names and Addresses, 63 Fed. Reg. 31741 (June 10, 1998) (noting that commentators criticized the regulation on this basis).

167. *See* H.R. REP. NO. 106-412, at 14 (1999) (acknowledging that the Act does not provide for in rem jurisdiction over domain names registered outside of the United States).

168. The question of whether the defendant has any other intellectual property rights in the domain name is a factor that may be considered in the context of the bad faith showing under paragraph (1)(B)(i)(I), but as discussed below, this is difficult in in rem cases where the domain name holder is not even a party to the proceedings. 15 U.S.C. § 1125(d)(1)(B)(i)(I) (2012).

trademark holders without attempting to reconcile them with the rights of foreign trademark holders.[169]

There have been cases in which legitimate foreign trademarks were challenged under the ACPA for overlapping with U.S. trademarks. For example, in *Hartog & Co. AS v. Swix.com*, the plaintiff, a Norwegian company that owned the mark "SWIX" in the United States, brought suit against two domain names owned by a Swiss company called Swix Internet, which possessed the mark "SWIX" in Switzerland.[170] Although that suit ultimately did not succeed because no brand dilution could be proven and the defendants had not acted in bad faith,[171] it was a case where the two companies had been involved in the dispute for some time and the defendant was aware of the lawsuit. It is difficult to assess how the results may have come out if the defending party was truly unaware of the lawsuit, as is possible with ACPA in rem actions where no notice is required to be given to foreign registrants.

Although the ACPA provides a safe harbor for defendants who "believed and had reasonable grounds to believe that the use of the domain name was a fair use or otherwise lawful,"[172] it is difficult to say if this would protect the absent defendant in a truly ex parte proceeding involving only the domain name in an in rem action. If the defendant is absent, and indeed does not know that the case is taking place, how accurate would an assessment of the defendant's intent be, and indeed, who would even make the defense?[173] Although the safe harbor provision may have been meant to exclude from liability the use of a domain name by, for example, a

169. *See* Nguyen, *supra* note 153, at 557 ("[T]he ACPA's digital trademark right appears to have been enacted solely for the purpose of protecting United States trademark owners at the expense of legitimate domain name and trademark owners outside the nation's physical boundaries."). Scholars have argued that this is a violation of the Paris Convention, which requires each signatory's national law to be limited to territorial application. *Id.* at 542–44.

170. Hartog & Co. AS v. Swix.com, 136 F. Supp. 2d 531 (E.D. Va. 2001).

171. The ACPA outlines nine factors to be considered in assessing the bad faith of the registrant. 15 U.S.C. § 1125(d)(1)(B)(i). For further discussion of these factors, see Matthew Edward Searing, Note, *"What's in A Domain Name?" A Critical Analysis of the National and International Impact on Domain Name Cybersquatting*, 40 WASHBURN L.J. 110, 120 (2000).

172. 15 U.S.C. § 1125(d)(2)(B)(ii).

173. This issue is exacerbated by the fact that, unlike in other trademark infringement cases, liability under the ACPA turns on intent rather than conduct; it does not require any "commercial use" of the domain name, only the defendant's bad faith intent with respect to the domain name. Snow, *supra* note 125, at 39–40. This places even more importance on the ability to accurately assess the registrant's intent, a task made more difficult by the registrant's absence.

legitimate foreign business, it is difficult to see how much protection such a provision would offer in an in rem proceeding. By allowing trademarks of different countries to be pitted against each other on terms designed to protect only U.S. trademarks, the ACPA fails to comport with the principles of international comity.

### C. FAILURE TO UTILIZE INTERNATIONALIZED DISPUTE RESOLUTION

Another policy consideration against the ACPA is that continued reliance on it today interferes with the more internationalized domain name dispute resolution system run by ICANN. Roughly around the same time that the ACPA was passed, ICANN developed and implemented the Uniform Domain–Name Dispute Resolution Policy (UDRP), which all ICANN–approved registrars follow.[174] Under the UDRP, disputes over domain names and cybersquatting claims can be addressed in expedited administrative proceedings at the request of the trademark holder, who can file a complaint with a dispute resolution service.[175] In the complaint, the complainant must specify the trademarks on which the complaint is based and provide reasons that (1) the domain name is identical or confusingly similar to the trademark; (2) why the current domain name holder has no rights or legitimate interests in the domain name; and (3) why the domain name should be considered to have been registered in bad faith.[176] These are strikingly similar to the ACPA's requirements. The remedy under the UDRP is also the same as that under the ACPA: the cancellation of the domain name or the transfer of the domain name to the complainant.[177] An independent panel of either a single member or three members hears the case.[178]

The UDRP has several key advantages over the ACPA. It is a fast and cost–effective alternative that is readily accessible, and it poses no jurisdictional issues because it relies on contractual agreements.[179] Compared to the

174. *See* INTERNET CORP., *supra* note 30.

175. *See id.*

176. *See Rules for Uniform Domain Name Dispute Resolution Policy*, INTERNET CORP. FOR ASSIGNED NAMES & NUMBERS (Sept. 28, 2013), https://www.icann.org/resources/pages/udrp-rules-2015-03-11-en.

177. INTERNET CORP., *supra* note 30.

178. INTERNET CORP., *supra* note 176.

179. Connie L. Ellerbach, *UDRP Versus ACPA: Choosing the Right Tool to Challenge Cybersquatting*, FENWICK & WEST LLP 1 (Sept. 29, 2003), https://www.fenwick.com/publications/pages/udrp-versus-acpa-choosing-the-right-tool-to-challenge-cybersquatting.aspx. The major advantage of the ACPA over the UDRP is that U.S. courts are better equipped than a dispute resolution panel to adjudicate complex, fact–intensive claims (e.g., if a claim of bad faith is circumstantial). *Id.* Otherwise, the ACPA is attractive in large part

ACPA, the UDRP better meets the demands of international comity.[180] It is run by ICANN, a non–profit organization which has been functionally independent since 2009.[181] The handover in October 2016 gave ICANN complete independence.[182] ICANN conceives of itself as serving a "global community supporting the vision of 'one world, one Internet.' "[183] Although some have worried whether ICANN would be sufficiently internationalized as an independent rather than intergovernmental organization,[184] others have praised ICANN's multilateral, stakeholder–led structure.[185] Governments stay involved with ICANN through the Governmental Advisory Committee (GAC), which can force ICANN's board to vote on an issue but must do so by consensus, ensuring that no one country can

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because it gives litigants a second bite at the apple if their UDRP claim fails, as discussed below. *See id.*

180. However, the U.S. Department of Commerce has long stated that it would not accept a proposal that ceded control to an intergovernmental organization. Wyatt, *supra* note 20. For a time, some speculated that the United Nations would take control over ICANN if the United States missed the October 1 handover deadline, a possibility that was met with concern. L. Gordon Crovitz, *An Internet Giveaway to the U.N.*, WALL ST. J. (Aug. 28, 2016, 5:52 PM), http://www.wsj.com/articles/an-internet-giveaway-to-the-u-n-1472421165. Others have also worried that the United States will continue to exert influence over ICANN, which, despite its independence, remains a U.S. entity subject to U.S. law, unlike organizations such as the Red Cross, which operate under international law. Kieren McCarthy, *French Scream Sacré Bleu! as US Govt Gives up the Internet to ICANN*, REGISTER (Mar. 24, 2016, 9:25 PM), http://www.theregister.co.uk/2016/03/24/france_slams_us_govt_internet_transition.

181. ICANN is not without its problems and has been criticized for its lack of accountability. *See, e.g.*, Olivier Sylvain, *Legitimacy and Expertise in Global Internet Governance*, 13 COLO. TECH. L.J. 31 (2015); Rolf H. Weber & Shawn Gunnarson, *A Constitutional Solution for Internet Governance*, 14 COLUM. SCI. & TECH. L. REV. 1 (2013). However, companies such as Facebook and Google, as well as advocacy groups like Public Knowledge and Access Now, have supported the transfer to ICANN. Finley, *supra* note 17. An alliance of companies including Facebook and Google has called the transfer "imperative," arguing that "a global, interoperable and stable Internet is essential for our economic and national security." Shelby Carpenter, *Google, Facebook Say It's 'Imperative' That U.S. Hand Over Control of Internet*, FORBES (Sept. 13, 2016, 1:01 PM), http://www.forbes.com/sites/shelbycarpenter/2016/09/13/google-facebook-say-its-imperative-u-s-hand-over-control-of-internet.

182. Finley, *supra* note 17.

183. *Welcome to ICANN!*, INTERNET CORP. FOR ASSIGNED NAMES & NUMBERS, https://www.icann.org/resources/pages/welcome-2012-02-25-en (last visited Aug. 20, 2017). Despite ICANN's stance, however, there have also been more radical calls for the internationalization of the Internet by having ICANN's powers transferred to the International Telecommunication Union, which is controlled by the United Nations. *See, e.g.*, Uddin, *supra* note 156, at 844.

184. *See, e.g.*, McCarthy, *supra* note 180.

185. Finley, *supra* note 17.

unilaterally push an action through.[186] Furthermore, the UDRP dispute resolution service providers are spread out across geographical areas: in addition to U.S.–based services, there are also dispute resolution services based in Europe, Asia, and the Middle East.[187]

Aside from issues of comity, continued use of the ACPA also raises issues of fairness and equity because some U.S. complainants use the ACPA to get a second bite at the apple after receiving an adverse ruling from UDRP. Filing an ACPA action prevents any adverse decision in a UDRP decision from being implemented,[188] and the decision of a U.S. court on the ACPA claim can also reverse the UDRP ruling.[189] Thus, the ACPA not only competes with the UDRP but interferes with the finality of the UDRP's decisions, overriding them for U.S. trademark holders. Such a practice runs counter to the interests of efficiency, comity, and finality. Of course, the UDRP is not a perfect system, and given how new it is, is a work in progress.[190] However, the perpetual prospect of having its determinations halted and overturned by U.S. courts also does little to inspire faith in the UDRP process or to motivate stakeholders to invest in improving it.

Even worse, the ACPA sets a bad example, emboldening other localities to pursue their own remedies in Internet cases and further balkanizing Internet governance. In 2008, a Kentucky court ordered the seizure of 141 domain names in an in rem action because they hosted Internet gambling websites illegal under Kentucky law.[191] The court reasoned that the ACPA did not foreclose any uses of the domain as a basis for jurisdiction in other

186. *Id.* For more detailed analysis and criticism of the GAC's role in ICANN, see Sylvain, *supra* note 181.

187. *List of Approved Dispute Resolution Service Providers*, INTERNET CORP. FOR ASSIGNED NAMES & NUMBERS, https://www.icann.org/resources/pages/providers-6d-2012-02-25-en (last visited Aug. 20, 2017).

188. INTERNET CORP., *supra* note 30.

189. Ellerbach, *supra* note 179, at 2.

190. For criticisms of the UDRP and suggestions for its reform, see Julia Hörnle, *The Uniform Domain Name Dispute Resolution Procedure: Is Too Much of a Good Thing a Bad Thing?*, 11 SMU SCI. & TECH. L. REV. 253 (2008); A. Michael Froomkin, *ICANN's "Uniform Dispute Resolution Policy"—Causes and (Partial) Cures*, 67 BROOK. L. REV. 605 (2002); Patrick D. Kelley, Note, *Emerging Patterns in Arbitration Under the Uniform Domain-Name Dispute-Resolution Policy*, 17 BERKELEY TECH. L.J. 181 (2002).

191. *See* Commonwealth v. 141 Internet Domain Names, No. 08-CI-1409, 2008 WL 5261775 (Ky. Cir. Ct. 2008) (citing 15 U.S.C. § 1125(d)(2)(D)(4)). For discussions of the case, see Kirk D. Homeyer, Note, *Can a State Seize an Internet Gambling Website's Domain Name? An Analysis of the Kentucky Case*, 2 UNLV GAMING L.J. 107 (2011); Jack Mellyn, Note, *"Reach Out and Touch Someone": The Growing Use of Domain Name Seizure as a Vehicle for the Extraterritorial Enforcement of U.S. Law*, 42 GEO. J. INT'L L. 1241, 1252 (2011).

Internet–related cases[192] and essentially attempted to enforce its own version of the ACPA, except enforcement was not of U.S. trademarks but of Kentucky state law. Such attempts by individual jurisdictions to enforce their own laws on the Internet will only generate further chaos.

Congress passed the ACPA to help U.S. trademark holders combat cybersquatting, a serious problem for which there was little other recourse at the time of passage.[193] Now that there is an internationalized alternative for pursuing cybersquatting, it makes little sense for the United States to insist on a unilateral course of action. With the handover in October 2016, the United States gave oversight authority over the Internet to ICANN, taking a step toward internationalizing the governance of the Internet.[194] The continuing use of the ACPA to pull domain name disputes into the Eastern District of Virginia contravenes the spirit of these policies that support the internationalization of the Internet based on a multilateral approach.

## V. PROPOSALS FOR REFORM

Despite the ACPA's problems, a complete judicial overhaul of the ACPA is improbable given that courts have been unwilling to find the ACPA unconstitutional.[195] However, several adjustments to the ACPA regime may ameliorate the problems of lack of notice and due process without impeding the fundamental goals of the ACPA. Furthermore, legislation that sets requirements for how domain registrars interact with their buyers may help provide some notice to foreign registrants of their potential exposure under the ACPA.

### A. REDEFINE DOMAIN NAME SITUS AS THE REGISTRAR LOCATION

Limiting the situs of a domain name to only the location of the registrar, and not the locations of the registry or any other domain name authority, should be the first step in developing a more equitable and legally coherent

192. *Commonwealth*, 2008 WL 5261775.

193. REPORT TO CONGRESS, *supra* note 142.

194. *See* Steve Dent, *ICANN Reveals Plan for Ending America's Control of the Internet*, ENGADGET (Aug. 4, 2015), http://www.engadget.com/2015/08/04/icann-us-transition-proposal.

195. *See* Cable News Network L.P. v. CNNews.com, 162 F. Supp. 2d 484, 491 (E.D. Va. 2001), *aff'd in part, vacated in part sub nom.* Cable News Network, LP, v. CNNews.com, 56 F. App'x 599 (4th Cir. 2003); *see also* Caesars World, Inc. v. Caesars-Palace.com, 112 F. Supp. 2d 502, 505 (E.D. Va. 2000). Courts have appeared to be more willing to reject on constitutional precedent than to allow any challenges to the ACPA's grant of jurisdiction. *See* discussion *supra* Section III.A.

ACPA regime. This one minor change comes with a number of substantial advantages.

First, disallowing in rem suits based solely on the location of the registry ameliorates the due process issues with the ACPA. For in rem suits based on the location of the domain name's registry, it is difficult to make a convincing case that a foreign registrant possesses minimum contacts with the United States merely because the information of the domain name she purchased from a foreign registrar was subsequently stored in the U.S. registry. However, the argument that minimum contacts exists is much more palatable for foreign registrants who interact with a U.S. registrar to purchase the domain name. For similar reasons, this change ameliorates issues related to lack of notice because foreign registrants who use U.S. registrars are more fairly on notice that their domain name purchase subjects them to U.S. laws compared to counterparts who use a foreign registrar.

Second, such a change would remove the legal and logical incoherence of having multiple situses for domain names. This change would bring the ACPA in line with existing schools of legal thought on where the situs for intangible property ought to be located.

Third, limiting the ACPA to domain names registered with U.S. registrars would lead to a more equitable distribution of domain name dispute cases within the judiciary. This restriction would change the status quo where the United States, and specifically the Eastern District of Virginia, asserts jurisdiction over the majority of domain name disputes. There would be space for the number of registrars in different countries to grow and ebb over time, and also for new countries to be awarded a portion of authority over domain name disputes as registrars develop there. Thus, limiting the domain name situs to the location of the registrar rectifies the worst overreaches of the ACPA without requiring substantial changes to the statute.

### B. REVAMP REGISTRAR CONTRACTS TO PROVIDE NOTICE

Reforming registrar contracts is another important step toward giving domain name buyers fair notice of their exposure to U.S. law. If the ACPA regime is here to stay, the next best thing is for foreign registrants to be made aware of it so that they do not purchase domain names without the knowledge that doing so exposes them to U.S. law. Such a modification can be made not only through congressional action but also regulatory action by ICANN, which possesses the power to direct registrars to include certain terms in their contracts with registrants.[196]

196. Froomkin, *supra* note 19, at 214.

The domain name market is complex, and it is difficult for foreign registrants to have notice that their domain names are subject to U.S. laws for three reasons. First, not only do foreign buyers only interact with their foreign registrar and not the relevant registry, but there could also be another intermediary layer of resellers which offer registration services on behalf of registrars,[197] making the connection to the U.S. registry even more attenuated. Many registrars offer registration through affiliated resellers.[198] This means that a German citizen in Germany may purchase a domain name with a German reseller, which in fact serves a French registrar, which ultimately connects to a U.S. registry—such that there are multiple layers of entities between a registrant and the U.S. registry which have different national affiliations.

Second, registry–registrar connections are cross–cutting; that is, each registrar often serves multiple registries, selling domain names with many different TLDs. For example, a registrar may sell ".com" and ".bar" domain names at the same time. This practice makes it difficult for domain name buyers to determine what registry is behind the particular registrar they use, because the corresponding registry also depends on which domain name they purchase. It is unrealistic for all ".com" registrants to intuit that choosing the ".com" ending makes them vulnerable to U.S. laws since the registry for ".com" is based in the United States, but that choosing the ".bar" ending does not, since its registry is located in Mexico.

Third, the registrant's contract with the registrar often includes forum selection clauses which name the jurisdiction of the registrar's location as the exclusive forum for disputes related to the domain name, giving the impression that the domain name can only be litigated there. These make it especially confusing for consumers to understand which laws govern their domain name purchase. For example, the registration agreement provided by the registrar DomainRegistry.com states:

> **Choice of Law and Venue**: This Agreement and all rights hereunder shall be governed by the laws of the State of New York. Any judicial action relating to this Agreement or to your use of the DomainRegistry site shall be brought exclusively in the federal or state courts of Pennsylvania, in the United States of America,

197. *Domain Name Registration Process*, INTERNET CORP. FOR ASSIGNED NAMES & NUMBERS, https://whois.icann.org/en/domain-name-registration-process (last updated July 2017).

198. *See, e.g.*, ENOM, http://www.enom.com/resellers/benefits-domains.aspx (last visited Aug. 20, 2017).

> subject to any exceptions provided elsewhere in this greement [sic].[199]

From this text, it would be reasonable for a lay domain name purchaser—even one savvy enough to seek out and read the forum selection clause in a long contract—to conclude that she should only expect interactions with Pennsylvania courts. Yet if she purchased a domain name ending in ".com," ".net," or ".org" from DomainRegistry.com, the situs of her domain name would be in the Eastern District of Virginia under the ACPA, and her domain name would be subject to suit there.[200]

Several modest changes can help resolve these issues. First, the contract should set out where the registry of the domain name in question is located, in addition to where the registrar itself is located. This change would not represent a drastic departure from how such contracts currently read, as many registrar contracts already contain provisions that separate out different registries. For example, the registrar Network Solutions contains, for a dozen or so TLDs, additional legal conditions in the form, "Additional Terms Applicable to Services In Connection With .Biz TLD."[201] Similarly, the domain name registration contract maintained by Integrity Technology Services already provides legal notices and disclaimers specific to different TLDs.[202] For a ".tw" TLD, for example, the contract states, "With regards to .TW domain names only, this Agreement will be interpreted and governed by the Laws of Taiwan."[203]

Second, forum selection clauses should make clear that they apply only to disputes between the registrar and the domain name buyer, perhaps with an additional disclaimer that there may be third–party claims that stem from other jurisdictions. For example, the registration agreement provided by the

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199. *Registration Agreement Service Agreement*, DOMAINREGISTRY.COM (Mar. 2005), http://www.domainregistry.com/agreement.jsp.

200. Of course, there are some preconditions to trigger the ACPA's in rem provision, including that the purchaser provided false or outdated information to WHOIS and cannot reasonably be located. But the number of purchasers who provide fraudulent information cannot be overstated: one study found that seventy–seven percent of registrations contain false or unverifiable information. McCarthy, *supra* note 12. Purchasers commonly provide such false information for less than malicious reasons, such as a desire to protect their privacy or avoid spam. *See id.*

201. *See Web.com Master Services Agreement*, NETWORK SOLUTIONS, http://www.networksolutions.com/legal/static-service-agreement.jsp (last visited Aug. 20, 2017).

202. *See Domain Registration Agreement*, INTEGRITY TECHNOLOGY SERVICES, http://www.integritytechservice.com/domain-registration-agreement (last visited Aug. 20, 2017).

203. *Id.*

registrar Namecheap effectively states that its forum selection clause applies only to disputes between the registrar and the buyer:

> You agree that any action brought by you to enforce this Agreement or any matter brought by you and which is against or involves us and which relates to your use of the Services shall be brought exclusively in the United States District Court for the Central District of California . . . . You consent to the personal and subject matter jurisdiction of any state or Federal court in Los Angeles County, State of California in relation to any dispute between you and us under this Agreement.[204]

Third, for all domain names subject to U.S. registries, contracts should provide notice about the ACPA and its protection of U.S. trademarks, as well as the possibility of an in rem action against foreign registrants. This would only require an additional line such as: "The registry for this top-level domain is a U.S. entity, and domain name disputes arising out of any U.S. trademark claims may subject this domain name to the jurisdiction of U.S. courts under the Anticybersquatting Consumer Protection Act." These changes would at least help inform registrants about their exposure to U.S. law, and perhaps even effect changes in behavior that would prevent cybersquatting attempts.[205]

A significant advantage of this solution is that it can be achieved not only through legislative action by Congress but also regulatory action by ICANN. One way for such contract reform to be implemented, of course, is for Congress to pass a law directing all U.S. registrars to include these clarifications and provisions in their registration agreements. However, the downside of the congressional action approach is both that it would be difficult to achieve[206] and that it would only be able to affect registrars that are U.S. entities. Because exposure to the ACPA is currently often based on

204. Registration Agreement, NAMECHEAP, https://www.namecheap.com/legal/domains/registration-agreement.aspx (last visited Aug. 20, 2017).

205. Admittedly, such attempts to inform registrants can only be successful insofar as people read their terms of service, which is a lot to ask given how lengthy and complicated such agreements are, and people are conditioned to simply click through these "clickwrap" or "browsewrap" agreements. For these fixes to be truly effective, they should to be situated in a larger reform of such online agreements, for example to offer the agreements in plain English. For a discussion of these issues, see Allison S. Brehm & Cathy D. Lee, *"Click Here to Accept the Terms of Service"*, COMM. LAW., Winter 2015; Thomas A. Dickerson & Mark A. Berman, *Consumers' Loss of Rights in the Internet Age*, N.Y. ST. B.J., October 2014, at 38.

206. Indeed, a Congress willing to pass legislation to improve registrar contract would likely also be willing to reexamine the ACPA in its entirety, which would be a more direct approach to the ACPA's problems.

registry location rather than registrar location, this would not help improve notice for foreign registrants using foreign registrars, a more likely scenario.[207]

A more feasible and comprehensive alternative would be for ICANN to require registrars to include such language in their agreements. As the upstream entity that certifies and delegates power to registrars, ICANN has the power to require all registrars to include standard terms in their service agreements.[208] ICANN already does this, for example, when it requires registrars to obtain certain personal and contact information from its registrants in order to populate the WHOIS database.[209] With broad power to shape the interaction between registrars and registrants across the world, ICANN can take action to implement these reforms for all registrars and provide better notice to all registrants.

## VI. CONCLUSION

The ACPA arose out of an important effort to help U.S. trademark holders combat cybersquatting. However, in crafting a solution to the problem, Congress passed an overbroad law that both faces legal difficulties and reflects a unilateral approach to Internet governance that is no longer U.S. policy today.

This Note has suggested two ameliorative measures, short of a direct modification of ACPA by Congress, to help fix the worst of the ACPA's legal and policy problems. First, the courts should redefine the situs of a domain name exclusively as the location of the registrar. This approach would not only be legally consistent with the treatment of other intangible property but would avoid the type of extraterritorial application to foreign registrants that infringes on due process rights. Furthermore, it would be a step toward a more diversified system of authority over domain name disputes given that registrars are more widely dispersed across the globe than registries. Second, registration agreements should provide registrants notice of their potential exposure to the laws of the United States and other countries, as applicable to the type of domain name they purchase. In order

207. Of course, if Congress or the courts were to adopt this Note's proposal to limit the ACPA's definition of situs to the location of the registrar only, this approach *would* be adequate to inform all registrants facing exposure under the ACPA since only those registrants that interacted with a U.S. registrar would be subject to the in rem provision, and all such registrants would have received notice through their agreements with the U.S. registrars.

208. Froomkin, *supra* note 19.

209. *Id.*

to achieve this, confusing forum selection clauses should be revised, and specific guidance should be included for each type of top–level domain.

The ACPA is no longer a functional or desirable policy for the United States without some much–needed fixes. More than a decade and a half after the passage of the ACPA, much has changed in the manner in which domain name purchasers interact with domain name registrars. With the introduction of new services like gTLDs, the online environment is likely to grow even more complex and internationalized. U.S. policy regarding Internet governance has also shifted to embrace a more open model of Internet governance with the October 2016 handover of the Internet directory to ICANN. In light of these changes, Congress and the courts should reexamine the ACPA and its extension of in rem jurisdiction over domain names.

# THE DATA-POOLING PROBLEM

*Michael Mattioli*[†]

## ABSTRACT

American innovation policy as expressed through intellectual property law contains a curious gap: it encourages individual research investments, but does little to facilitate cooperation among inventors, which is often a necessary precondition for innovation. This Article provides an in–depth analysis of a policy problem that relates to this gap: increasingly, public and private innovation investments depend upon the willingness of private firms and institutions to cooperatively pool industrial, commercial, and scientific data. Data holders often have powerful disincentives to cooperate with one another, however. As a result, important research that the federal government has sought to encourage through intellectual property policy and through other targeted investments is being held back.

This Article addresses this issue by offering three contributions—one theoretical, one empirical, and one prescriptive. The theoretical contribution builds upon legal, economic, and public choice literature to explain why pooling data is relevant to innovation policy and why the level of data sharing in some settings may be suboptimal. This discussion offers a conceptual framework for scholars and policymakers to examine how data–pooling relates to innovation policy goals.

This leads to the second contribution: an ethnographic study of private efforts to pool data in an important field of research. This Article focuses on the field of cancer treatment because it is one of the most active areas where efforts to pool data have recently coalesced. Interviews with lawyers, executives, and scientists working at the vanguard of "Big Data" projects in the field of cancer treatment offer a detailed view of how, precisely, data–pooling problems can hinder technological progress. The study's most significant finding is that impediments to the pooling of patient treatment and clinical trial data are diverse, nuanced, and not reducible to collective action problems that are already well understood by legal scholars and economists, such as the free–rider dilemma.

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These findings lead to the third key contribution: a set of targeted policy suggestions designed to facilitate data pooling through regulatory action, amendments to federal healthcare legislation, and tax incentives. These prescriptive measures are tailored to address the sharing of health–related data, but they capture an approach that could be applied in other settings where technological progress depends upon data–pooling. Ultimately, this Article argues for a vision of innovation policy in which cooperative exchanges of data are recognized as important preconditions for innovation that may require government support.

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## I. INTRODUCTION

This Article explores a policy problem at the intersection of federal innovation policy[1] and "Big Data."[2] The problem's outlines are starkly simple: the U.S. government seeks to promote innovation primarily by

1. Legal scholars and economists commonly use the term "innovation policy" to refer to policy interventions designed to bring about technological advances. *See, e.g.*, Brett M. Frischmann & Mark A. Lemley, *Spillovers*, 107 COLUM. L. REV. 257 n.26 (2007) (discussing the role of pecuniary spillovers in innovation policy); Adam B. Jaffe, Josh Lerner & Scott Stern, *Introduction*, *in* 1 INNOVATION POLICY AND THE ECONOMY (2000) (describing innovation policy as encompassing "longstanding issues, such as the appropriate level and form of public support of research, as well as . . . intellectual property and the appropriate antitrust treatment of . . . industries where technology standards play a key role."); Clarisa Long, *Patent Signals*, 69 U. CHI. L. REV. 625, 675 (2002) (discussing the role of the patent system in innovation policy). *See generally* NICHOLAS S. VONORTAS ET AL., INNOVATION POLICY: A PRACTICAL INTRODUCTION (Nicholas S. Vonortas, Phoebe C. Rouge & Anwar Aridi eds., 2014).

2. "Big Data" describes the practice of drawing new and valuable insights from large datasets that typically hold little independent value. *See generally* VIKTOR MAYER-SCHÖNBERGER & KENNETH CUKIER, BIG DATA: A REVOLUTION THAT WILL TRANSFORM HOW WE LIVE, WORK, AND THINK 1–18 (2013) (discussing the Big Data phenomenon generally).

encouraging individual research investments, but cooperation among information holders is an important precondition for innovation in many settings.[3] An increasingly important form of such cooperation is the aggregation (i.e., pooling) of data held by firms, institutions, and individuals. This Article examines the forces that discourage data pooling in an important field of research—oncology treatment—and considers how the federal government might intervene to better promote innovation.

Scholars have long recognized that innovation can blossom from combinations of technological information, such as industrial knowledge and descriptions of inventions. In the 1980s, the economists Richard Nelson and Sidney Winter wrote, "[I]nnovation in the economic system—and indeed the creation or any sort of novelty in art, science, or practical life—consists to a substantial extent of a recombination of conceptual and physical materials that were previously in existence."[4] Nearly sixty years earlier, Joseph Schumpeter described the same idea when he defined innovation as the discovery of new relationships between previously combined conceptual components.[5] Today, scholars of industrial organization call this form of technological advancement, "recombinant innovation."[6]

Recently, it seems that a new kind of recombinant innovation has drawn widespread attention: Big Data. Rather than drawing upon combinations of technological information, Big Data draws upon combinations of factual information. Credit card receipts, Internet search histories, and patient

3. For a fascinating analysis of the importance of health insurers in creating new information that is valuable to research and innovation, see Rebecca S. Eisenberg & W. Nicholson Price II, *Promoting Healthcare Innovation on the Demand Side* (U. of Mich. Law, Public Law and Legal Theory Research Paper Series No. 503, 2016), http://ssrn.com/abstract=2766707. This intersectional or combinational type of innovation is distinct from "cumulative innovation" which scholars often describe through reference to Isaac Newton's "shoulders of giants" trope. *See infra* Section I.A; *see also* Oren Bar-Gill & Gideon Parchomovsky, *The Value of Giving Away Secrets*, 89 VA. L. REV. 1857, 1858 (2003) ("Cumulative innovation characterizes most industrial sectors."); Suzanne Scotchmer, *Standing on the Shoulders of Giants: Cumulative Research and the Patent Law*, 5 J. ECON. PERSP. 29, 37 (1991) ("Most innovators stand on the shoulders of giants, and never more so than in the current evolution of high technologies, where almost all technical progress builds on a foundation provided by earlier innovators.").

4. RICHARD R. NELSON & SIDNEY G. WINTER, AN EVOLUTIONARY THEORY OF ECONOMIC CHANGE 130 (1982).

5. *See* JOSEPH A. SCHUMPETER, BUSINESS CYCLES: A THEORETICAL, HISTORICAL, AND STATISTICAL ANALYSIS OF THE CAPITALIST PROCESS (1939).

6. ANDREW HARGADON, HOW BREAKTHROUGHS HAPPEN: THE SURPRISING TRUTH ABOUT HOW COMPANIES INNOVATE 31–52 (2003) (terming this characteristic "recombinant innovation").

treatment records from hospitals are standard examples of information that, in earlier times, was treated as digital detritus. Recently, however, computer scientists, statisticians, and engineers who specialize in data science have developed useful algorithms with the help of vast sets of such data.[7]

The value of Big Data algorithms lies in their predictive power. Just as weather forecasting techniques can determine the likelihood of a storm, Big Data algorithms may soon be able to predict the likelihood that a crime will occur on a particular street corner, the odds that a consumer will purchase a product after seeing an online advertisement, or whether a cancer patient will respond well to a particular treatment.[8] Importantly, experts believe that the most valuable applications of Big Data—"the real deal," as one expert interviewed for this Article called it—will be drawn from sets of data from different sources.[9] As one technology commentator recently put it, "when

7. *See, e.g.*, IAN AYRES, SUPER CRUNCHERS 88–111 (2007) (discussing the how the aggregation of patient records combined with analytics could improve healthcare); STEPHEN BAKER, THE NUMERATI 98–99 (2008) (describing the usefulness of gathering large amounts of data for analysis); MAYER-SCHÖNBERGER & CUKIER, *supra* note 2 (describing Big Data and its implications for science, industry, and society); ERIC SIEGEL, PREDICTIVE ANALYTICS: THE POWER TO PREDICT WHO WILL CLICK, BUY, LIE, OR DIE 203 (2013) (exploring Big Data's impact on society); PATRICK TUCKER, THE NAKED FUTURE: WHAT HAPPENS IN A WORLD THAT ANTICIPATES YOUR EVERY MOVE? 183–202 (2014) (discussing the use of data analytics to predict crime); BIG DATA IS NOT A MONOLITH (Cassidy R. Sugimoto, Hamid R. Ekbia & Michael Mattioli eds.) (2016) (presenting a multifaceted picture of Big Data, including discussions about its impact on different academic disciplines and industrial domains).

8. *See supra* note 7; *see also* Jessica M. Eaglin, *Constructing Recidivism Risk for Sentencing*, 67 EMORY L.J. (forthcoming 2017), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2821136 (discussing predictive data–based tools used in connection with criminal sentencing).

9. *See, e.g.*, U.S. Patent No. 7,444,655 (listing Microsoft as assignee on "Anonymous Aggregated Data Collection"). *See generally* MAYER-SCHÖNBERGER & CUKIER, *supra* note 2; Christine Borgman, *The Conundrum of Sharing Research Data*, 63 J. AM. SOC'Y FOR INFO. SCI. & TECH. 1059 (2012) (discussing the importance of data aggregation). For reasons explained in Part II, the ethnographic study at the heart of this Article focuses on efforts to pool cancer research data. A useful example of the power of aggregating and analyzing large sets of data in a different domain is "Google Photos," a service offered by Google Inc. By pooling and analyzing image data contained in photographs contributed by many users, Google engineers have developed algorithms that can recognize objects in photographs with unprecedented accuracy. *See* Joshua A.T. Fairfield, *Mixed Reality: How the Laws of Virtual Worlds Govern Everyday Life*, 27 BERKELEY TECH. L.J. 55, 97 (2012) (describing Google's "particularly aggressive" photo scraping and recognition capability).

we recombine . . . multiple datasets together, that sum . . . is worth more than its individual ingredients."[10]

Experts in this new field believe the best way to aggregate data for this purpose is through cooperative licensing—i.e., pooling. In simple terms, a central administrator collects data from multiple data holders, analyses the data, and then delivers helpful insights back to the contributors and possibly licenses the data to third–parties.[11] There is an intuitive appeal to this model: patent holders have long pooled related inventions to facilitate the production and development of new technologies.[12] This mode of cooperation has been helpful to patent licensors and licensees alike by dramatically reducing transaction costs, which are thought to be a chief impediment to patent licensing in settings where ownership of related patents is highly dispersed.[13] Without explicitly referring to patent pools, experts in some industries and fields of research have recently attempted to organize institutions similarly structured around the goal of collective data licensing.[14]

Any apparent similarities between pooling patents and pooling data might be superficial, however. For one thing, contributing data to a pool can entail steep up–front costs. It is costly to record, organize, and store vast amounts of data on an ongoing basis.[15] It is even costlier to ensure that data is accurate, that it is disclosed in a manner that comports with various laws and regulations (pertaining to privacy, for instance), that its provenance and

10. MAYER-SCHÖNBERGER & CUKIER, *supra* note 2, at 108; *see also* Borgman, *supra* note 9, at 1070 ("Indeed, the greatest advantages of data sharing may be in the combination of data from multiple sources, compared or 'mashed up' in innovative ways.").

11. The process is highly analogous to patent pools for standards–essential patents—patents which are required to implement an industry standard—where groups of patent holders pool patents under the supervision of a third party administrator. Kassandra Maldonado, *Breaching RAND and Reaching for Reasonable: Microsoft v. Motorola and Standard-Essential Patent Litigation*, 29 BERKELEY TECH. L.J. 419, 446 (2014).

12. *Id.* (describing effective use of patent pools to facilitate licensing standard essential patents).

13. Patent pools are federations of patent holders that reduce transaction costs by collectively licensing complementary patent rights under unified agreements. For a deep historical view of patent pooling, see Michael Mattioli, *Power and Governance in Patent Pools*, 27 HARV. J.L. & TECH. 421 (2014); FLOYD L. VAUGHAN, THE UNITED STATES PATENT SYSTEM (1956); OLIVER E. WILLIAMSON, THE ECONOMIC INSTITUTIONS OF CAPITALISM 20–22 (1985); Robert P. Merges, *Contracting into Liability Rules: Intellectual Property Rights & Collective Rights Organizations*, 84 CALIF. L. REV. 1293, 1393 (1996).

14. *See, e.g.*, *infra* Part III (presenting the results of an ethnographic study of oncology data pools).

15. Priscilla M. Regan, *Federal Security Breach Notifications: Politics and Approaches*, 24 BERKELEY TECH. L.J. 1103, 1108 (2009).

pedigree are adequately documented and disclosed, and so forth.[16] Patent holders also incur upfront costs, of course, in the form of research and patent prosecution expenses. From an ex ante perspective, however, the value of developing a patentable invention does not typically hinge upon eventual membership in a patent pool; rather, it turns on the underlying value of the invention itself. In contrast, as this Article explains, some types of data are useful *only* when aggregated. As a result, if a thriving pool does not already exist at the time the data is generated, weak incentives may exist for the relevant data holder to maintain the data and prepare it for pooling. The work of Nobelists in economics and political theory also suggests that data holders will be reluctant to pool their data due to the risk of free riders—i.e., third parties who obtain and benefit from the data without compensating the data holders.[17] Put simply, there are some compelling reasons to expect that efforts to pool useful data will flounder due to widespread "social dilemmas."[18]

Anecdotal evidence, while limited, supports these doubts. Christine Borgman, a leading computer science commentator, recently wrote that "[t]he 'dirty little secret' behind the promotion of data sharing is that not much sharing may be taking place."[19] Recent journalistic accounts of Big Data often explain the potential benefits of data pooling, but rarely cite examples of such cooperation in practice.[20] Instead, most real–world

16. *See, e.g.*, Michael Mattioli, *Disclosing Big Data*, 99 MINN. LAW REV. 525 (2014). The costs of sharing cancer research data are specifically outlined *infra* in Section III.C.; *see also* Part II, *infra* (discussing HIPAA).

17. This concern stems from a vast body of scholarship, both theoretical and empirical, concerning information generation and sharing. *See, e.g.*, Joel Mokyr, *The Commons of Knowledge: A Historical Perspective*, 4 ANN. PROC. WEALTH & WELL-BEING NATIONS 29 (2012), https://www.beloit.edu/upton/assets/4_MOKYRpages29_44.pdf. Leading intellectual property scholars addressed this concern in reference to scientific research data in the 1990s. *See infra* notes 119, 121 and accompanying text (discussing the work of Pamela Samuelson, J.H. Reichman, and Paul Uhlir). Under U.S. law, license agreements and trade secrets law offer data holders potential recourse against parties who directly misappropriate data. Data holders also can attempt to prevent data misappropriation through physical or electronic barriers, such as encryption. *See infra* Section II.A.

18. *See, e.g.*, KENNETH J. ARROW, SOCIAL CHOICE AND INDIVIDUAL VALUES 59 (1951) (discussing the defects of voting procedures); Robyn M. Dawes & David M. Messick, *Social Dilemmas*, 35 INT'L J. PSYCHOL. 111, 111 (2000) (defining social choice problems or social dilemmas as "situations in which each member of a group has a clear and unambiguous incentive to make a choice that—when made by all members—provides poorer outcomes for all than they would have received if none had made the choice.").

19. Borgman, *supra* note 9, at 1060 (identifying problems and limitations).

20. *See, e.g.*, James Glantz, *Is Big Data an Economic Dud?*, N.Y. TIMES (Aug. 17, 2013), http://www.nytimes.com/2013/08/18/sunday-review/is-big-data-an-economic-big-

examples of Big Data involve large, vertically integrated corporations looking inward and drawing insights from the data they already hold.[21] Highly publicized reports of a recent failed effort to pool health data in the United Kingdom seem to lend credence to these doubts.[22]

If these concerns are empirically supported, policymakers should be concerned.[23] The federal government has invested heavily in the future development of Big Data. In March 2012, the White House announced a federal initiative under which six agencies committed over $200 million in funds to advance the development of "tools and techniques needed to access, organize, and glean discoveries from huge volumes of data."[24] In a press release, the White House likened this initiative to earlier federal efforts that led to "advances in supercomputing and the creation of the

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dud.html (discussing an emerging view held by economists that Big Data is not living up to its promise); Gary Marcus & Ernest Davis, *Eight (No, Nine!) Problems with Big Data*, N.Y. TIMES, Apr. 6, 2014 (exploring the limitations of Big Data and advocating a more tempered view of the phenomenon); Barnard Marr, *Where Big Data Projects Fail*, FORBES (Mar. 17, 2015, 12:28 PM), https://www.forbes.com/sites/bernardmarr/2015/03/17/where-big-data-projects-fail/ (arguing that many Big Data projects will ultimately fail to deliver); MATHIEU COLAS ET AL., CAPGEMINI CONSULTING, CRACKING THE DATA CONUNDRUM: HOW SUCCESSFUL COMPANIES MAKE BIG DATA OPERATIONAL (2014), https://www.capgemini-consulting.com/resource-file-access/resource/pdf/big_data_pov_03-02-15.pdf (reporting the results of a survey of 226 executives across several industries—e.g., retail, financial services, energy and utilities, and pharmaceuticals—in which only 27% of the organizations described their Big Data investments as "successful" and only 8% reported them as "very successful").

21. Authors frequently cite Target's analysis of its own customer records to predict when a customer's purchasing habits indicate they may be pregnant, Google's use of its own search records to predict the needs and wants of users, and Netflix's "mining" of its customers' viewing habits to make film recommendations and to develop its own programming. *See, e.g.*, David Carr, *Giving Viewers What They Want*, N.Y. TIMES (Feb. 24, 2013), http://www.nytimes.com/2013/02/25/business/media/for-house-of-cards-using-big-data-to-guarantee-its-popularity.html; Charles Duhigg, *How Companies Learn Your Secrets*, N.Y. TIMES MAG. (Feb. 16, 2012), http://www.nytimes.com/2012/02/19/magazine/shopping-habits.html; GOOGLE, *Flu Trends: How Does This Work*, https://www.google.org/flutrends/about/ (last visited Aug. 12, 2017).

22. *See, e.g.*, *infra* notes 117–18 and accompanying text (discussing the failed UK National Health Service's National Programme for IT).

23. As explained in Part II, this problem can be understood as one of underuse caused by a proliferation of exclusionary rights—i.e., a "tragedy of the anticommons." The term is typically used in reference to patent rights, but here the term is adopted to describe the possibly similar phenomenon with respect to data. *See, e.g.*, David E. Adelman, *A Fallacy of the Commons in Biotech Patent Policy*, 20 BERKELEY TECH. L.J. 985, 993 (2005) (describing the "anticommons" theory).

24. Press Release, White House, Obama Administration Unveils "Big Data" Initiative: Announces $200 Million in New R&D Investments (Mar. 29, 2012), https://obamawhitehouse.archives.gov/the-press-office/2015/11/19/release-obama-administration-unveils-big-data-initiative-announces-200.

Internet."[25] The White House later commended dozens of early–stage data–sharing ventures that "answered the President's call" for cooperative partnerships designed to accelerate the development of Big Data. (Two of these initiatives are subjects of the study in Part III of this Article.)[26] In early 2016, President Obama tasked Vice President Joe Biden to head "The Cancer Moonshot"—a federal initiative to promote the development of cancer cures, in part, by providing an infrastructure for sharing genomic information.[27] If data held by non–public actors such as private hospitals, corporations, and individuals is not widely pooled, however, then the effectiveness of the government's targeted investments in this area may be limited.

Hindrances to private data pooling could also undermine the federal government's broader goals of promoting technological progress. A primary goal of the patent system, for instance, is to encourage research investments in a multitude of technological fields—including those fields where Big Data may be poised to spur innovation, such as oncology treatment.[28] Because recent Supreme Court jurisprudence has called the patentability of some kinds of algorithms into question, some types of Big Data algorithms may not be patentable.[29] Nevertheless, a data pool could open the door to an algorithm, which in turn could open many more doors to related patentable inventions regardless of the original algorithm's patentability.[30] In short, there is widespread agreement among experts in

25. *Id.*

26. Press Release, Executive Office of the President, "Data to Knowledge to Action" Event Highlights Innovative Collaborations to Benefit Americans (Nov. 12, 2013), https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/Data2Action%20Press%20Release.pdf.

27. Laurie McGinley, *Biden to Tackle Broad Range of Cancer Issues, Including Drug Prices, After Leaving White House*, WASH. POST (Jan. 4, 2017), https://www.washingtonpost.com/news/to-your-health/wp/2017/01/04/biden-to-tackle-cancer-drug-prices-as-part-of-post-white-house-moonshot-work/; *Genomic Data Commons Data Portal*, NAT'L CANCER INST., https://portal.gdc.cancer.gov/ (last visited Aug. 12, 2017).

28. For an important related discussion of the intersection of patent law and data, see Brenda M. Simon & Ted Sichelman, *Data-Generating Patents*, 111 NW. U. L. REV. 377 (2017).

29. *See* Alice Corp. Pty. Ltd. v. CLS Bank Int'l, 134 S. Ct. 2347 (2014) (indicating that a software method may not be patentable if it covers only an abstract idea, and if there is no additional "inventive concept" that applies to the underlying abstraction); *see also* Robert Merges, *Symposium: Go Ask* Alice *— What Can You Patent After* Alice v. CLS Bank*?*, SCOTUSBLOG (June 20, 2014), http://www.scotusblog.com/2014/06/symposium-go-ask-alice-what-can-you-patent-after-alice-v-cls-bank/ (discussing the implications of the *Alice* case on patentability).

30. *See infra* Part IV.

many fields that data pooling is an important precondition for technological progress. The pooling of data is, as a result, relevant to policies that seek to promote innovation.[31]

After explaining the policy relevance of data pooling in greater detail, this Article drills down to explore how it is affecting just one field of research: cancer treatment. This field was selected because it is one of the most active areas where efforts to pool data have recently coalesced.[32] Interviews with lawyers, executives, and scientists working at the vanguard of Big Data projects in the field of oncology offer a detailed view of how precisely data–pooling problems can hinder technological progress.

The interviews conducted for this study reveal that, contrary to conventional wisdom, the data–pooling problem as it affects cancer treatment is not reducible to either a free–rider dilemma or privacy concerns. Rather, the impediments are contextual: concerns over professional, competitive, and reputational standing, for instance, are powerfully discouraging the pooling of cancer treatment and research data. According to subjects interviewed, hospitals and other healthcare providers are reluctant to share data that might reflect poorly on the quality of service they provide; pharmaceutical companies, meanwhile, wish to closely guard data that could reduce the value of existing or future intellectual property, including patents and trade secrets; many academic researchers are loath to share data that could fuel publications; individual patients, meanwhile, may feel hesitant to share data that could expose them to various forms of discrimination.[33]

Drawing upon these findings and others, this Article considers whether the government should seek to promote technological progress by encouraging data pooling. The Article then presents a menu of possible interventions that address some of the impediments uncovered by the study. These suggestions are specific to the field of cancer treatment and research,

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31. Relatedly, the Defend Trade Secrets Act of 2016 aims to "incentivize future innovation." S. REP. NO. 114-220, at 3 (2016), https://www.congress.gov/congressional-report/114th-congress/senate-report/220/1. Trade secret law offers a less compelling example of government policy that would be undermined by data–sharing problems, however: this is because trade secrecy may discourage the disclosure of data collection preparation methods, which is necessary for the useful exchange of data. I explored this topic in an earlier article. *See* Mattioli, *supra* note 13.

32. *See supra* notes 24–28.

33. A topic outside the scope of this study is whether and how technological norms and infrastructures impede data sharing. Such norms may include, for instance, mandatory registration or "login" procedures that offer little to no value to data holders and that, in the aggregate, impose high transaction costs on innovative data aggregation. Telephone Interview with Anonymous Subjects #7 and #8, Nat'l Insts. of Health (NIH) (Oct. 21, 2014).

but they capture a methodology that could be helpful in other settings as well. A broad goal of this Article is to encourage similar studies of data pooling in other industries and research settings.

Part II of this Article explains how the aggregation of information (including data) relates to federal innovation policy. This background discussion helps situate the Big Data phenomenon within a policy framework and explains the theoretical basis for expecting pooling efforts to run up against collective action problems. Part III presents an original ethnographic study of data pooling in the field of cancer research. As briefly noted above, discussions with individuals involved in several data pooling projects reveal that some of the most significant problems data pools face are more complex and nuanced than theory predicts. Part IV considers the appropriateness of a policy response to the problems uncovered by the study. The discussion then offers a set of policy proposals designed to address some of the impediments to pooling uncovered by the study. There is no "one–size–fits–all" solution, however. This closing discussion argues for a view of innovation policy in which cooperative data pooling is regarded as an important precondition for innovation that may sometimes require government intervention. Part V concludes.

## II. A BIG DATA ANTICOMMONS?

Big Data is a promising new platform for innovation that often requires, as a prerequisite, the aggregation of data held by different firms, institutions, and individuals. There is reason to doubt that such aggregation will occur frequently or broadly enough to be meaningful, however, without support from the government.[34] Scholars from the fields of law, economics, public choice, and other disciplines have theorized that information of many kinds (including data) is ill–suited to widespread exchange.[35] The chief problems, these theorists believe, are that valuable information is often costly to prepare for exchange and highly subject to free–riding, as well as being risky to share when doing so might run afoul of privacy laws.[36] Anecdotal accounts from the front lines of Big Data seem to support this prediction.[37] Because barriers to data pooling stand to undermine federal innovation policy goals, policymakers should be concerned, and should explore potential corrective steps.

34. *See infra* Section II.B. (discussing barriers to naturally emerging data pools).
35. *See, e.g.*, *id.*
36. *Id.*
37. *Id.*

### A. INFORMATION EXCHANGE AND INNOVATION POLICY

Combinations of technological information, such as industrial knowledge and descriptions of inventions, can fuel innovation.[38] Joseph Schumpeter described this phenomenon when he wrote that technological innovation involves "combin[ing] factors in a new way," or through "carrying out new combinations" of ideas.[39] The economic historian Abbott Payson Usher similarly called innovation "the constructive assimilation of preexisting elements into new syntheses, new patterns, or new configurations."[40] Innovation, Usher explained, "establishes relationships that did not previously exist."[41] The esteemed economists Richard R. Nelson and Sidney G. Winter echoed Usher and Schumpeter's views.[42] Nobelist Kenneth Arrow similarly viewed technological information held by different firms as "the major input" of inventive activity, "apart from the talent of the inventor."[43] As explained in Part I, experts in some fields call this type of technological advancement "recombinant innovation."[44]

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38. Some of history's preeminent scientists and inventors have described the act of invention as a process of combining and repurposing existing information. In a 1908 essay, the famed mathematician Henri Poincaré explained that he discovered new mathematical relationships not by happening upon them at chance, but rather by deliberately combining well–known mathematical concepts ("entities" as he called them) until useful combinations revealed themselves. HENRI POINCARÉ, SCIENCE AND METHOD 50–51 (Francis Maitland trans., Courier Corp. 1914) ("What, in fact, is mathematical discovery? . . . Discovery consists precisely in not constructing useless combinations, but in constructing those that are useful, which are an infinitely small minority. Discovery is discernment, selection. . . . Among the combinations we choose, the most fruitful are often those which are formed of elements borrowed from widely separated domains."). Thus, although Poincaré's creative process was highly structured, it was not mechanical. "The real work . . . is not merely . . . manufacturing as many combinations as possible," but rather "in choosing between these combinations with a view to eliminating those that are useless." *Id.* at 57.

39. SCHUMPETER, *supra* note 5, at 84, 88.

40. ABBOTT PAYSON USHER, A HISTORY OF MECHANICAL INVENTIONS 11 (1929). Interestingly, Usher relied upon this definition to explain mechanical inventions as well as the creation of artistic works. *Id.*

41. *Id.*

42. SCHUMPETER, *supra* note 5, at 130.

43. Kenneth Arrow, *Economic Welfare and the Allocation of Resources for Invention*, *in* THE RATE AND DIRECTION OF INVENTIVE ACTIVITY: ECONOMIC AND SOCIAL FACTORS 618 (1962); *see also* Robert P. Merges, *Institutions for Intellectual Property Transactions: The Case of Patent Pools*, *in* EXPANDING THE BOUNDARIES OF INTELLECTUAL PROPERTY: INNOVATION POLICY FOR THE KNOWLEDGE SOCIETY 125 (Rochelle Dreyfuss et al. eds., 2000), https://www.law.berkeley.edu/files/pools.pdf ("Arrow set the stage for a new type of theory, one that recognized the need to assemble information and property rights from disparate sources in the process of bringing a product to market.").

44. *See, e.g.*, ANDREW HARGADON, SUSTAINABLE INNOVATION: BUILD YOUR COMPANY'S CAPACITY TO CHANGE THE WORLD 127–47 (2015).

It is helpful to note that recombinant innovation is distinct from "incremental innovation"—a form of technological advancement frequently discussed by intellectual property scholars.[45] Incremental innovation refers to a vertical process of improving upon existing technologies. Recombinant innovation, by contrast, involves the horizontal assembly of complementary technological information from different sources.[46] The invention of the mimeograph machine is a paradigmatic example. Thomas Edison developed the device by combining the idea of a printing press with that of a rapidly moving stylus mechanism used in automatic telegraph machines.[47] Edison did not invent these components nor did he improve upon them; rather, he combined them in a useful and complementary way.[48]

Although intellectual property scholars rarely use the term, the patent system encourages recombinant innovation. A central goal of the patent system is to encourage technological progress generally.[49] Even more specifically though, patent law's "obviousness bar" denies patent protection

45. *See, e.g.*, Rebecca S. Eisenberg, *Patents and the Progress of Science: Exclusive Rights and Experimental Use*, 56 U. CHI. L. REV. 1017, 1055 (1989) ("Scientists have been proclaiming their indebtedness to the research of their predecessors for centuries"); Mark A. Lemley, *The Economics of Improvement in Intellectual Property Law*, 75 TEX. L. REV. 989, 997 (1997) ("Rather, knowledge is cumulative—authors and inventors must necessarily build on what came before them."); Suzanne Scotchmer, *Standing on the Shoulders of Giants: Cumulative Research and the Patent Law*, 5 J. ECON. PERSP. 29, 29 (1991) ("Most innovators stand on the shoulders of giants, and never more so than in the current evolution of high technologies, where almost all technical progress builds on a foundation provided by earlier innovators."); Arti Kaur Rai, *Regulating Scientific Research: Intellectual Property Rights and the Norms of Science*, 94 NW. U. L. REV. 77, 90 (1999) ("The communal character of science is also manifested in a recognition by scientists of their dependence upon a cumulative cultural heritage.").

46. This is a somewhat stylized dichotomy: many inventions embody a mixture of incremental and recombinant innovation. Scholars have defined innovation broadly; for example, innovation has been defined as "the search for, and the discovery, development, improvement, and adoption of new processes, new products, and new organizational structures and procedures." Thomas M. Jorde & David J. Teece, *Innovation, Cooperation and Antitrust*, 4 BERKELEY TECH. L.J. 1, 5 (1989); *see also* Andrew Hargadon, *Brokering Knowledge: Linking Learning and Innovation*, 24 RES. ORG. BEHAV. 41, 44 (2002) (presenting case studies that illustrate this point).

47. JAN FAGERBERG ET AL., THE OXFORD HANDBOOK OF INNOVATION MANAGEMENT 171 (2014).

48. *See id.* Similar historical examples are legion. As Lee Fleming and Olav Sorenson have noted, "one might think of the automobile as a combination of the bicycle, the horse carriage, and the internal combustion engine. The steamship can be characterized as combining the boat with steam power." Lee Fleming & Olav Sorenson, *Technology as a Complex Adaptive System: Evidence From Patent Data*, 30 RES. POL'Y 1019, 1020 (2001).

49. Dan L. Burk, The Role of Patent Law in Knowledge Codification, 23 Berkeley Tech. L.J. 1009, 1009–10

to inventions that "would have been obvious . . . to a person having ordinary skill in the art to which the claimed invention pertains."[50] This rule denies patent protection to inventions that cover obvious combinations of prior art (technological information), while favoring inventors who combine prior art in ways that are unexpected or that were previously discouraged.[51] Patent law's obviousness bar does not establish a rule that *all* inventors must combine existing technological information creatively, of course, but it clearly rewards inventors who do.[52] In this way, it seems to reflect a policy judgment that the public stands to benefit when technological information is combined in unexpected ways.[53]

Saurabh Vishnubhakat and Arti Rai recently offered a valuable empirical view of this phenomenon:

> Because the USPTO assigns relevant USPC classifications to each patent, a patent's classes identify the distinct technologies that the inventor combined to produce the invention—and the combination identifies the particular interdisciplinarity at work in that instance of inventive activity. Historically, the rate at which

50. Laura G. Pedraza-Fariña, *Patent Law and the Sociology of Innovation*, 2013 WIS. L. REV. 813, 818 (2013); *see also id.* at 861 ("First, the obviousness inquiry should be structured so as to reward, and thus incentivize, those inventions that transport ideas, techniques, and problems across disciplinary boundaries, especially when vested interests are likely to delay or block fruitful intersections between communities of practice.").

51. 35 U.S.C. § 103 (2012) (imposing nonobviousness as a requirement for patentability).

52. Today, this body of law makes patent protection available (assuming other threshold requirements are met), to inventors who combine existing ideas and technological knowledge in unexpected ways, such as when there has been no prior teaching, suggestion, or motivation to do so. *See* Justin Lee, *How* KSR *Broadens (Without Lowering) the Evidentiary Standard of Nonobviousness*, 23 BERKELEY TECH. L.J. 15, 21 (2008).

53. Federal case law reflects the view that when fields of knowledge are particularly distinct, "the bringing together of knowledge held in widely diverse fields itself becomes invention." Johnson & Johnson v. W. L. Gore & Associates, Inc., 436 F. Supp. 704, 723 (D. Del. 1977). Obviousness doctrine has been shaped in many respects by adjudications of validity challenges asserted against patents that resulted from combinations of two or more prior art references—i.e., recombinant innovations. *See, e.g.*, Christelle K. Pride, *Misguided Panic and Missed Opportunity for Pharmaceutical Inventions: How Unexpected Results Eclipsed Reasonable Expectation of Success in* BMS v. Teva, 31 BERKELEY TECH. L.J. 587, 594 (2016) (considering implications of major nonobviousness decisions on future trajectory of case law); Tolga S. Gulmen, *Model Jury Instructions on Nonobviousness in the Wake of* KSR*: The Northern District of California's Approach*, 24 BERKELEY TECH. L.J. 99, 100–05 (2009) (providing a history of nonobviousness decisions arising from challenges to recombinant technology patents); Jeffrey A. Lefstin, *The Formal Structure of Patent Law and the Limits of Enablement*, 23 BERKELEY TECH. L.J. 1141, 1162 (2008) (analyzing major obviousness decisions dealing with recombination).

> new inventions have introduced new technological capabilities, representing new technological classes, has slowed considerably. Yet surprisingly, the rate at which new combinations of technological classes have emerged has systematically kept pace with the number of new patents.[54]

Interestingly, federal law is largely unconcerned with whether, as a preliminary matter, inventors have adequate access to sufficient technological information that can later be combined.[55] The reason for this sanguine attitude may simply be that such information has often been widely accessible. The ideas that Thomas Edison recombined into the mimeograph, for instance, had been described in published patents.[56] Technological information flows through many other channels as well, such as academic publications and trade journals.[57] Innovative firms can also acquire technological information by hiring individuals with expertise in diverse fields, and through corporate mergers and acquisitions.[58] A veritable subfield of economic and legal scholarship has developed around the study of how such channels of technological information influence innovation.[59]

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54. Saurabh Vishnubhakat & Arti K. Rai, *When Biopharma Meets Software: Bioinformatics at the Patent Office*, 29 HARV. J.L. & TECH. 205, 239 (2015).

55. The National Cooperative Research and Production Act is one of the most significant pieces of legislation at the federal level designed to encourage cooperation among researchers. National Research and Production Act, 15 U.S.C. §§ 4301–06 (2000). This law and has not been a chief subject of interest among legal scholars focused on innovation policy, however.

56. *See* FAGERBERG ET AL., *supra* note 47, at 171; *see also*, KSR Int'l Co. v. Teleflex, 550 U.S. 398, 426–27 (2007) (framing obviousness analysis from the perspective of persons of ordinary skill in the art); *In re* Dembiczak, 175 F.3d 994, 998–1000 (Fed. Cir. 1999) (setting forth "suggestion, teaching, or motivation to combine" as a test for obviousness).

57. The history of airplane technology includes many examples of information exchanges yielding innovation. *See generally* Peter B. Meyer, *An Inventive Commons: Shared Sources of the Airplane and Its Industry*, *in* GOVERNING KNOWLEDGE COMMONS 341 (Brett M. Frischmann, Michael J. Madison & Katherine J. Strandburg eds., 2014).

58. The Ford Motor Company provides a helpful example of how recombinant innovation can develop through hiring. Ford developed important new methods of building automobiles by hiring engineers with complementary technical know–how in diverse and seemingly unrelated fields, including bicycle design and grain processing. DAVID HOUNSHELL, FROM THE AMERICAN SYSTEM TO MASS PRODUCTION, 1800-1932: THE DEVELOPMENT OF MANUFACTURING TECHNOLOGY IN THE UNITED STATES 217–226 (1985). Indeed, "[r]ather than chasing whole new ideas . . . Ford focused on recombining old ideas in new ways." *Id.* at 217; *see also* HARGADON, *supra* note 44, at 133.

59. *See generally* STEVEN JOHNSON, WHERE GOOD IDEAS COME FROM (2010); EVERETT M. ROGERS, DIFFUSION OF INNOVATIONS (2003) (exploring the conditions that often give rise to innovation and emphasizing the importance of conditions that facilitate connections between disparate sources of information); Katherine Strandburg et al., *Law*

Useful technological information can also be obtained through licensing, joint development projects, and similar private cooperative arrangements.[60] The organizational theorist David J. Teece has noted, "interactions among firms and institutions are important to the innovation process . . . Information exchange and cooperative relationships of various kinds lie at the heart of . . . tremendously innovative assemblage[s] of physical and human assets."[61] In her work examining the innovative activities of small firms, Maryann P. Feldman has similarly written, "interactions and cooperation among autonomous organizations commanding specialized complementary assets and sources of knowledge may be critical to innovative success."[62] Andrew Hargadon, who conducted rich ethnographic studies of corporate innovation yielded from cooperative information exchange, has consistently explained that because the social world is "fragmented into many small domains," innovation requires "bridging multiple domains and moving ideas from where they are known to where they are not."[63]

The foregoing discussion can be reduced to a few concise points: first, the aggregation of technological information is an important precondition for innovation; second, the federal government broadly seeks to encourage such innovation; third, the task of aggregating technological information for this purpose is largely left up to private actors. Sometimes, useful information is publicly disclosed (in a published patent or trade publication, for instance); other times, useful information can be obtained through private arrangements, including transactions. As the following Section explains, these concepts are central to a timely policy question.

### B. THE DATA–POOLING QUESTION

The recent Big Data phenomenon represents, by all accounts, a new kind of recombinant innovation. Rather than relying upon combinations of technological information, data scientists who specialize in Big Data rely

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*and the Science of Networks: An Overview and an Application to the Patent Explosion*, 21 BERKELEY TECH. L.J. 1293 (2006) (applying network science to examine flows of technological information).

60. Maryann P. Feldman has noted, however, that large, vertically integrated companies are "able to internalize innovative inputs and provide complementary assets to facilitate innovation." Maryann P. Feldman, *Knowledge Complementarity and Innovation*, 6 SMALL BUS. ECO. 363, 370 (1994).

61. David J. Teece, *Information Sharing, Innovation, and Antitrust*, 62 ANTITRUST L.J. 465, 470 (1994).

62. Feldman, *supra* note 60, at 363.

63. Hargadon, *supra* note 46, at 44.

upon combinations of factual information—i.e., data.[64] Investors and technologists have high hopes for this phenomenon. In a 2012 television interview, a widely–known American venture capitalist famously described Big Data as the "new oil."[65] Policymakers seem to have embraced this optimism. As explained in the Introduction, the federal government has committed over $200 million toward Big Data projects, and the Obama Administration made the promotion of Big Data an important component of federal innovation policy.[66] In his 2016 State of the Union Address, President Obama announced that Vice President Joseph Biden would head a new related initiative called the "Cancer Moonshot."[67] A major goal of this initiative is to encourage more robust and effective data sharing.[68]

The sources of data that can fuel Big Data practices are myriad, ranging from smartphones, to social networks, credit card purchase records, personal health devices, and more.[69] Practitioners in this new field seek to develop valuable algorithms by applying new statistical methods to large sets of such data. For example, a seemingly unrelated collection of web search records can reveal where influenza is most likely to next strike;[70] a pool of credit card purchase records can show that people who purchase small felt pads to protect their floors from furniture damage typically have

64. Contrary to what the term may appear to suggest, "Big Data" refers to a methodology, and not a particular type or quantity of data. *See* sources cited *supra* notes 2, 7. Some researchers call this practice "data-intensive science." THE FOURTH PARADIGM: DATA-INTENSIVE SCIENTIFIC DISCOVERY (Tony Hey, Stewart Tansley & Kristin Tolle eds., 2009) (coining the term "data-intensive science").

65. This quote has been widely attributed to the venture capitalist Ann L. Winblad. *See, e.g.*, Perry Rotella, *Is Data the New Oil?*, FORBES (Apr. 2, 2012, 11:09 AM), http://www.forbes.com/sites/perryrotella/2012/04/02/is-data-the-new-oil/.

66. *See, e.g.*, *supra* notes 2, 7 and accompanying text (various leading sources that describe the Big Data phenomenon).

67. Press Release, White House, Fact Sheet: Investing in the National Cancer Moonshot (Feb. 1, 2016), https://obamawhitehouse.archives.gov/the-press-office/2016/02/01/fact-sheet-investing-national-cancer-moonshot.

68. *See* TYLER JACKS, ELIZABETH JAFFEE & DINAH SINGER ET AL., CANCER MOONSHOT BLUE RIBBON PANEL REPORT 3 (2016), https://www.cancer.gov/research/key-initiatives/moonshot-cancer-initiative/blue-ribbon-panel/blue-ribbon-panel-report-2016.pdf (describing that a goal of the project is to "[c]reate a National Cancer Data Ecosystem to collect, share, and interconnect a broad array of large datasets so that researchers, clinicians, and patients will be able to both contribute and analyze data, facilitating discovery that will ultimately improve patient care and outcomes."). This document also explains the importance of obtaining diverse oncology data. *Id.* at 12.

69. *See supra* notes 20, 21 and accompanying text (reporting on a variety of situations where Big Data has been used, including types of data).

70. *See, e.g.*, Jeremy Ginsberg et al., *Detecting Influenza Epidemics Using Search Engine Query Data*, 457 NATURE 1012 (2009).

high credit scores;[71] seemingly ordinary shopping records can predict pregnancy with remarkable accuracy;[72] and the treatment records of one million cancer patients could offer a good prediction of how well future patients will fare under a particular course of treatment.[73] These and similar examples feature prominently in popular books and recent press accounts.[74]

As its name suggests, Big Data relies upon vast corpuses of factual information.[75] Experts have emphasized that the most powerful sets of data for this purpose are drawn from different sources. In 2012, for example, IBM collaborated with the carmaker Honda and the Pacific Gas and Electric Company in California to research the best times and locations for electric cars to be recharged.[76] By pooling historical data from the power grid with car–generated data and additional data from GPS receivers, IBM was able to develop an algorithm that determined the ideal locations for car recharging stations.[77] An expert interviewed for this Article opined that drawing insights from pooled datasets in this manner is the very essence of Big Data.[78] "The single data set has very little value," she explained, adding that "[t]he unique intellectual property is from the integration of data sets and the algorithms that you can generate on top of them. It's much more [valuable] if you combine, [say], air quality data and behavioral medicine

71. *See* Paul Ohm & Scott R. Peppet, *What if Everything Reveals Everything?*, *in* BIG DATA IS NOT A MONOLITH 45 (Cassidy R. Sugimoto et al. eds., 2016) (describing this example in greater detail); MAYER-SCHÖNBERGER & CUKIER, *supra* note 2.

72. *See* MAYER-SCHÖNBERGER & CUKIER, *supra* note 2, at 58.

73. *The Promise of Big Data for Cancer Patients and Practices*, COTA HEALTHCARE (Apr. 6, 2017), https://www.cotahealthcare.com/post/how-cancer-practices-and-patients-benefit-from-big-data

74. Algorithms derived from Big Data can have broad utility and some may meet the threshold requirements for patentability. Ognjen Zivojnovic, *Patentable Subject Matter After* Alice*—Distinguishing Narrow Software Patents from Overly Broad Business Method Patents*, 30 BERKELEY TECH. L.J. 807, 809 (2015). As one attorney for Microsoft commented in a telephone interview conducted for this Article, "There is valuable IP in the analytics of big data. Methods of analyzing the data." Telephone Interview with Anonymous Subject #66, Microsoft (Jan. 22, 2014).

75. *See* MAYER-SCHÖNBERGER & CUKIER, *supra* note 2, at 107 (discussing "Recombinant Data"); Erik Brynjolfsson & Andrew McAfee, *The Innovation Dilemma: Is America Stagnating?*, TALKING POINTS MEMO CAFE (Feb. 11, 2014, 6:01 AM), http://talkingpointsmemo.com/cafe/the-innovation-dilemma-is-america-stagnating ("[D]igital innovation is recombinant innovation in its purest form"); Ohm & Peppet, *supra* note 71, at 45 (drawing upon a definition coined by Microsoft that involves "seriously massive and often highly complex sets of information.").

76. *See* MAYER-SCHÖNBERGER & CUKIER, *supra* note 2, at 102–03.

77. *Id.*

78. Telephone Interview with Anonymous Subject #42 (Sept. 19, 2014).

data and understand the relationship and [discover] some unique combinatorial issue."[79]

This is where a potential problem arises. Much of the data that could serve as grist for the mill of Big Data inventions is generated and held privately.[80] As a result, the only practical way that many data scientists can obtain it is through licensing agreements. Theory suggests, however, that licensing data directly from multiple licensors on the scale necessary to draw useful insights from it could involve very high transaction costs.

A brief hypothetical can illustrate this problem.[81] Suppose a data scientist wishes to develop an algorithm that can predict the likely success of a particular medical treatment. This would–be inventor determines that developing the algorithm will first require her to identify patterns within large sets of patient treatment records. The data scientist must then conduct a search to learn which hospitals, academic research centers, or individuals hold this data.[82] This preliminary step alone could be costly and time–consuming. But let us assume the researcher forges ahead and finds that, say, twenty hospitals and five academic research centers hold the data she needs. The data scientist must then negotiate licensing agreements with each data holder. This step could significantly add to her costs. It could involve hiring a lawyer to draft agreements, holding meetings with each data holder, and other related costs. Added to these costs is the possibility that one or more of the data holders will simply refuse to cooperate or hold out for prohibitively high costs—i.e., the well–known "hold–out" or "hold–up" problem.[83] Assessing these transaction costs and risks, the would–be

79. *Id.*

80. *See, e.g.*, *infra* Part III.B. (discussing information holdout concerns in context of cancer research).

81. This hypothetical is modeled upon the cancer-research data landscape, the focus of the study in Part III of this Article.

82. *See, e.g.*, R.H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1, 15 (1960) ("In order to carry out a market transaction, it is necessary to discover who it is that one wishes to deal with, to inform people that one wishes to deal and on what terms, to conduct negotiations leading up to a bargain, to draw up the contracts, then undertake the inspection needed to make sure that the terms of the contract are being observed, and so on.").

83. *See, e.g.*, Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting*, 1 INNOVATION POL'Y & ECON. 119–50 (2001) (discussing patent holdout and license holdup problems); Benjamin C. Li, *The Global Convergence of FRAND Licensing Practices: Towards "Interoperable" Legal Standards*, 31 BERKELEY TECH. L.J. 429, 436–38 (2016).

inventor might decide to abandon her plans at the outset. As a result, the algorithm will never be developed.[84]

Intellectual property scholars will be quick to recognize this scenario. Manufactures and service providers face the same situation when they must license numerous complementary patent rights that apply to a single product.[85] Researchers could encounter a similar problem when attempting to license numerous "upstream" patents held by different companies in order to engage in an avenue of research that will yield a "downstream" innovation.[86] Leading commentators have argued that the transaction costs and holdout risks could appear so high in these situations that the would–be licensee (i.e., the manufacturer or the researcher) will decide to forego its plans, leading to a drop in commercialization and innovation. In a seminal 1998 article in *Science*, Rebecca Eisenberg and Michael Heller described this problem as one of underuse caused by a proliferation of exclusionary rights. They called this "The Tragedy of the Anticommons."[87] This term refers to "The Tragedy of the Commons"—the well understood inverse problem of *overuse* caused by a paucity of exclusionary rights.[88] Since the time of that publication, the existence and severity of this problem have been widely debated but the term has stuck.[89] Although data generally enjoys thin formal intellectual property protection and hence weaker exclusionary rights as compared to patents, the analogy still seems apt: trade secrecy, contracts, and practical measures such as encryption can discourage unlicensed uses of data to varying degrees.[90]

Patent holders have sometimes addressed these kinds of dilemmas by forming patent pools—institutions through which patent holders offer to license a collection of related complementary patents under a unified

84. The economist, political theorist, and Nobelist Kenneth Arrow once hinted at this possibility when he wrote that information is an important "input" to the process of innovation, but that aggregating information from multiple sources is likely fraught with transactional difficulties. Arrow, *supra* note 43, at 615.

85. Jeremy Mulder, *The Aftermath of* eBay*: Predicting When District Courts Will Grant Permanent Injunctions in Patent Cases*, 22 BERKELEY TECH. L.J. 67, 84 (2007) (describing this problem as a "patent thicket" and explaining how it inhibits innovation).

86. *Id.*

87. Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 SCIENCE 698, 698–701 (1998).

88. *See id.*

89. Matthew D. Satchwell, *The Tao of Open Source: Minimum Action for Maximum Gain*, 20 BERKELEY TECH. L.J. 1757, 1763 (2005) (referencing the "now famous tragedy of the anticommons" as an established part of the intellectual property literature base).

90. Mattioli, *supra* note 13.

agreement at a standard rate.[91] A central administrator typically licenses the collected patent rights, collects royalties, and distributes those sums to the patent holders according to a formula agreed upon beforehand.[92] This approach dramatically reduces the transaction costs that would otherwise proliferate and stall the productive use of the patents.[93] Rather than needing to search for relevant patent holders and negotiate a series of licenses, prospective licensees (i.e., manufacturers, service providers, and researchers) can simply approach a single pool for a license offered at a standard rate.[94] In a recent article, Robert P. Merges and I demonstrated that patent pools routinely conserve vast transaction costs within technology markets.[95]

It may seem appealing, then, to think that pooling is a viable solution to the problem of aggregating data. A data pool structured similarly to a patent pool might facilitate the aggregation of related data and spur innovation. This idea seems to have resonated with executives, technologists, and scientists in a number of industries that are embracing Big Data.[96] As Part III of this Article explores, experts in the field of cancer research are attempting to assemble such data pools as of this writing.[97]

As attractive as data pooling might seem, this cooperative model might not address some of the most important costs and problems associated with large–scale data licensing. Data holders who wish to form a pool would likely incur high costs just to make their data usable to others.[98] Data holders must maintain ever–expanding sets of data on an ongoing basis; they must ensure that this data is stored in formats that permit future use; they must verify the accuracy of the data, and if possible, correct errors or ambiguities in it; and the law may require a data holder to alter its data in order to

91. *See generally* Shapiro, *supra* note 83; Merges, *supra* note 13, at 1293; Merges, *supra* note 43, at 123, 129–30, 132, 144; Mattioli, *supra* note 13, at 421.

92. *Id.*

93. *See* Robert P. Merges & Michael Mattioli, *Measuring the Costs and Benefits of Patent Pools*, 78 OHIO ST. L.J. (forthcoming 2017), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2759027 (estimating transaction cost savings).

94. *Id.*

95. *Id*.

96. *See, e.g.*, *supra* notes 20–28.

97. The examples studied in this Article are based upon this hope. *See also* MAYER-SCHÖNBERGER & CUKIER, *supra* note 2, at 147–48 ("More likely, we'll see the advent of new firms that pool data from many consumers, provide an easy way to license it, and automate the transactions.").

98. Jorge L. Contreras, *Data Sharing, Latency Variables, and Science Commons*, 25 BERKELEY TECH. L.J. 1601, 1165 (2010) (describing database creation costs in analogous context).

preserve the privacy of individuals, among other barriers.[99] As Arti Rai has written, settings where health data is pooled "raise major transaction cost challenges, particularly to the extent data holders cannot guarantee that de-identified or anonymized data is impervious to re-identification."[100] As Amitai Aviram and Avishalom Tor observed before the advent of Big Data, the cost of establishing institutions to aid information exchanges could be costly enough to discourage such cooperation.[101] Moreover, data holders may often need to maintain and share clear records of the foregoing steps—i.e., "metadata" reflecting the provenance and pedigree of the underlying data—which they have weak incentives to document and disclose.[102]

Apart from these upfront costs, a vast body of scholarship from different disciplines suggests that pooling data is inherently problematic due to free–rider problems.[103] Literature on this subject is, in fact, too large to

99. Mattioli, *supra* note 13.

100. Arti K. Rai, *Risk Regulation and Innovation: The Case of Rights-Encumbered Biomedical Data Silos*, 92 NOTRE DAME L. REV. 1641 (2017).

101. Avishalom Tor & Amitai Aviram, *Overcoming Impediments to Information Sharing*, 55 ALA. L. REV. 231 (2003). Standard–setting is an important counterexample, however. When companies within an industry jointly develop a new technological standard, they will often agree beforehand to abide by certain information–sharing rules. Mark A. Lemley & Carl Shapiro, *A Simple Approach to Setting Reasonable Royalties for Standard-Essential Patents*, 28 BERKELEY TECH. L.J. 1135, 1136–37 (2013). These rules are typically promulgated and enforced by standard-setting organizations—institutions composed of a variety of private and public actors. *Id.* The International Organization for Standardization ("ISO"), which oversees the development of the MPEG video standard, for instance, requires its members to disclose information about patents relevant to the joint enterprise and to relinquish any claims of copyright they might assert over such disclosures. Christopher S. Gibson, *Globalization and the Technology Standards Game: Balancing Concerns of Protectionism and Intellectual Property in International Standards*, 22 BERKELEY TECH. L.J. 1403, 1481 (2007). The ISO also serves as a platform for the sharing of technological information (e.g., know–how, ideas, etc.) that leads to the development of mature standards. This process does not always go smoothly, however: legal scholars have observed that firms involved in standard–setting projects are often hesitant to disclose information to other members that might advantage their competitors. *Id.* at 1436 (describing an examine involving Chinese unwillingness to disclose state–owned trade secrets).

102. As I noted in a previous publication, data holders have few incentives to disclose such information, whereas patent holders must disclose a great deal of detail as a condition of the patent application process. *See generally* Mattioli, *supra* note 13.

103. Mokyr, *supra* note 17. Some might argue problem is aggravated by the relatively thin intellectual property protection U.S. law affords factual information such as data. *See, e.g.*, Charles C. Huse, *Database Protection in Theory and Practice: Three Recent Cases*, 20 BERKELEY TECH. L.J. 23, 24 (2005). Facts typically fall below the "originality" threshold of copyright law and outside of the defined classes of patentable subject matter. *Id.* As a result, holders of most kinds of data typically have a limited set of tools at their disposal to prevent misappropriation. *See generally* Jacqueline Lipton, *Balancing Private*

adequately summarize here. For purposes of this discussion, however, the work of two key scholars, Kenneth Arrow and Elinor Ostrom, is helpful to note.[104] Arrow identified a few interrelated challenges on this point: First, potential buyers or licensees of information sometimes cannot ascertain its value without first examining it—a result that sometimes negates the need for exchange in the first place.[105] Second, an actor who sells information on the open market risks suffering a loss in value if the buyer duplicates and redistributes that information.[106] Third, the demand for information can often be low when potential licensees who wish to use it as an "input" to the invention process see its value as highly speculative.[107] In Arrow's view, these "restriction[s] on the transmittal of information will reduce the efficiency of inventive activity in general and will therefore reduce its quantity also."[108]

Elinor Ostrom's scholarship offers some equally important and relevant insights. Ostrom is perhaps known best for the vivid portraits she depicted of self-governing communities that manage shared resources, at times avoiding the so-called "Tragedy of the Commons." Her 2012 book UNDERSTANDING KNOWLEDGE AS A COMMONS was motivated by these concerns and provides a roadmap for scholars to examine knowledge-sharing ethnographically.[109] Although research questions related to knowledge sharing could be examined through many lenses, Ostrom's framework is designed to capture important factors that might otherwise go overlooked—how characteristics of the information being shared and the

*Rights and Public Policies: Reconceptualizing Property in Databases*, 18 BERKELEY TECH. L.J. 773 (2003). These tools include trade secrecy, contracts, and practical barriers such as encryption. *Id.* at 786–87. From the perspective of data holders, these options are weaker than intellectual property rights in a critical respect, however: they cannot be used to stop unwanted uses of data that have already been widely disclosed. M. Scott McBride, *Bioinformatics and Intellectual Property Protection*, 17 BERKELEY TECH. L.J. 1331, 1354–55 (2002). That is, trade secrets, contracts, and encryption do not provide data holders with a mechanism to enjoin widespread unlicensed downstream reproduction and use. *Id.* When data is widely disclosed, the genie is often simply out of the bottle. *Id.*

104. A third scholar whose work may shed useful light on the subject is Friedrich Hayek, whose examined this theme—which he referred to as "The Knowledge Problem"—quite extensively. *See generally* FRIEDRICH HAYEK, THE CONSTITUTION OF LIBERTY (1960).

105. *See* Dan L. Burk & Brett H. McDonnell, *The Goldilocks Hypothesis: Balancing Intellectual Property Rights at the Boundary of the Firm*, 2007 U. ILL. L. REV. 575, 585 (2007) (discussing this problem as it relates to trade secrecy).

106. Arrow, *supra* note 43.

107. *Id.*

108. *Id.*

109. *See generally* UNDERSTANDING KNOWLEDGE AS A COMMONS (Charlotte Hess & Elinor Ostrom eds., 2007).

broader cultural, legal, and economic context can influence sharing, for instance.[110] Ostrom and the many scholars she inspired showed through ethnographic studies that the problems of sharing technological information are often nuanced, and more complicated than theory alone suggests.[111] Katherine Strandburg, Michael Madison, and Brett Frischmann have advanced this area of study in important ways, including through the development of the "Knowledge Commons" research framework—an approach to studying information-sharing institutions inspired by Ostrom's work.[112]

Ultimately, the work of Arrow, Ostrom, and others indicates that pooling information can present a classic "social dilemma"—i.e., a situation "in which each member of a group has a clear and unambiguous incentive to make a choice that, when made by all members, provides poorer outcomes for all than they would have received if none had made the choice."[113] Based upon this, there is good reason to expect efforts to pool data will often be unsuccessful, thus impeding the development of Big Data innovations. Stated differently, data may not be pooled frequently enough or widely enough to spur meaningful technological advances.

Recent scholarly and press accounts seem to support these concerns. Economists have recently doubted that Big Data will ever carry economic or social benefits;[114] one distinguished academic commentator recently predicted that Big Data will be "far less important than the great innovations of the 19th and 20th centuries."[115] Press reports of data–sharing failures seem to support these doubts.[116] One notable example was the failed UK

110. *Id.*

111. *See generally id.* (exploring many possible conditions that could lead to failed information exchanges). The ethnographic study presented in Part III of this Article was conducted according to Ostrom's Institutional Analysis and Development ("IAD") methodological framework.

112. *See generally* GOVERNING KNOWLEDGE COMMONS (Brett M. Frischmann, Michael J. Madison & Katherine J. Strandburg eds., 2014); UNDERSTANDING KNOWLEDGE AS A COMMONS, *supra* note 109; ELINOR OSTROM, GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION (1990).

113. Dawes & Messick, *supra* note 18, at 111–16 (defining social choice problems or social dilemmas).

114. *See* Glantz, *supra* note 20.

115. *See* Marcus & Davis, *supra* note 20.

116. *See e.g.*, John Markoff, *Troves of Personal Data, Forbidden to Researchers*, N.Y. TIMES (May 21, 2012), http://www.nytimes.com/2012/05/22/science/big-data-troves-stay-forbidden-to-social-scientists.html (reporting on widely–held concerns by scientific researchers who believe that private data–holders are impeding research through their unwillingness to share data that is useful for Big Data projects); Bernardo A. Huberman, *Sociology of Science: Big Data Deserve a Bigger Audience*, 482 NATURE 308 (2012)

National Health Service's National Programme for IT.[117] The plan, which was to pool patient medical records under a single roof, collapsed in large part because data holders (mostly hospitals) had strong disincentives to share information widely.[118]

Legal and economic scholarship written before the age of Big Data further supports the prediction of a Big Data anticommons. Pamela Samuelson and J.H. Reichman warned in the 1990s that information–sharing failures threatened to slow the pace of federally–funded scientific research.[119] Scholars of management have documented how the same types of cooperative problems impede information sharing within corporations.[120] Paul Uhlir and J.H. Reichman have noted that the severity of the problem may increase when diverse institutions are concerned and suggest that antitrust law might further discourage the pooling of data:

> The evidence shows that such [database] pools are very difficult to form when the value of upstream research products defies easy measurement and the relevant players in a given industry have very different agendas, as would occur when federal agencies, academic institutions, and different types of private companies are all involved. Moreover, there are far greater risks that such pools lead to collusive, anti-competitive behavior, to the erection of formidable barriers to entry.[121]

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("Many of the emerging 'big data' come from private sources that are inaccessible to other researchers."); Brett Hemenway & Bill Welser, *Cryptographers Could Prevent Satellite Collisions*, SCI. AM. (Feb. 1, 2015), https://www.scientificamerican.com/article/cryptographers-could-prevent-satellite-collisions/ (describing incident where U.S. and Russian satellites collided because both governments kept orbital data secret due); Austin Frakt, *Addiction Research and Care Collide With Federal Privacy Rules*, N.Y. TIMES (Apr. 27, 2015), https://www.nytimes.com/2015/04/28/upshot/federal-push-for-privacy-hampers-addiction-research-and-care.html (reporting how privacy regulations prompted insufficient disclosure of health records maintained by the federal government).

117. *See* Rajeev Syal, *Abandoned NHS IT System Has Cost £10bn So Far*, GUARDIAN (Sept. 17, 2013, 7:06 PM), http://www.theguardian.com/society/2013/sep/18/nhs-records-system-10bn.

118. *See* Lizzie Presser et al., *Care.data and Access to UK Health Records: Patient Privacy and Public Trust*, TECH. SCI. (Aug. 11, 2015), http://techscience.org/a/2015081103/.

119. J.H. Reichman & Pamela Samuelson, *Intellectual Property Rights in Data?*, 50 VAND. L. REV. 51, 56 (1997) (arguing that propertization of data would impede scientific progress and exchange).

120. Ulrike Cress et al., *Information Exchange With Shared Databases as a Social Dilemma*, 33 COMM. RES. 370 (2006) ("When group members exchange information via shared databases people are often reluctant to contribute information they possess.").

121. J.H. Reichman & Paul F. Uhlir, *A Contractually Reconstructed Research Commons for Scientific Data in A Highly Protectionist Intellectual Property Environment*,

Press accounts of Big Data innovations loosely align with these concerns. The most notable examples of Big Data innovations in practice have been developed by large, vertically–integrated firms that drew upon their own vast internal datasets, rather than through cooperative exchanges.[122]

Will data–pooling problems dampen innovation? Policymakers should be concerned by this possibility. As explained in Part II, barriers to data pooling could subvert recent federal policies designed to promote Big Data.[123] The patent system's goal of promoting technological progress is implicated by the success of data pooling as well. Recent Supreme Court jurisprudence has called the patentability of some kinds of software algorithms into question.[124] In particular, the decision in *Alice Corp. v. CLS Bank International* has cast doubts on the patentability of at least some kinds of patent claims pertaining to algorithms while providing only murky guidance on how such subject matter might qualify for patent protection.[125] But even so, experts believe Big Data has enormous potential to impact innovation. An unpatentable algorithm might open the door to new classes of patentable technologies and fields of research. The underlying policy concern thus seems clear: federal innovation policy seeks to promote technological advances that may not come about due to data–pooling problems.

Because of Big Data's immense and unrealized potential to stimulate and generate innovation, policymakers can benefit from understanding how successfully private actors are pooling useful data. To that end, the following Section presents an original ethnographic study of recent efforts to pool data in an important field of research.

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66 L. & CONTEMP. PROBS. 315, 403–04 (2003). The "database pools" these authors posited would be similar to patent pools in some respects. *See id.*

122. *See supra* notes 21–27.

123. *See supra* Part II.

124. *See, e.g.*, Merges, *supra* note 29 (discussing the implications of the recent *Alice* decision on the patentability of software methods, including algorithms related to data).

125. Alice Corp. Pty. Ltd. v. CLS Bank Int'l, 134 S. Ct. 2347 (2014). For an example of such commentary, see, e.g., Merges, *supra* note 29.

## III. A STUDY OF RECENT DATA–POOLING EFFORTS IN CANCER RESEARCH[126]

Is Big Data likely to develop into a thriving platform for innovation? According to experts in this new field, the answer to this question will hinge upon how effectively data held by different firms, institutions, and individuals can be aggregated. Here, this question is explored through an original ethnographic study of several burgeoning efforts to pool cancer treatment and research data.[127]

### A. STUDY METHODOLOGY

The decision to focus this study on cancer treatment and research data was motivated primarily by the fact that cancer research is one of few fields where data holders have sought to organize pools in order to advance innovation.[128] As a result, the setting is ripe for investigation. Secondly, as mentioned in the Introduction, the federal government has publicly applauded efforts to pool cancer treatment and research data.[129]

It is important to note, however, that this study's focus on cancer treatment and research data necessarily limits the extent to which its findings can be generalized. This study does not aim to conclusively prove or disprove the existence of a widespread data–pooling problem. The goal here is more modest. This is an investigation designed to learn whether the data–pooling problem predicted by theory is playing out in an important field of research. A secondary goal of this article is to serve as a model for how data–pooling problems in other industry and research settings can be examined and addressed in the future.

The organizations examined in this study were all founded on a simple, hopeful thesis: if medical data (e.g., patient treatment data, drug trial observations, etc.) is pooled on a large scale, data scientists will be able to develop algorithms that predict how well future patents will respond to certain therapies. The goal is not to invent new treatments, but rather to develop new methods of prescribing existing treatments. CancerLinQ, a

126. A companion chapter to this study appears in a forthcoming book published by Cambridge University Press. That chapter covers aspects of the history of data in the field of medicine and the field of oncology data not presented here. *Cancer: From a Kingdom to a Commons*, *in* GOVERNING MEDICAL KNOWLEDGE COMMONS (eds. Katherine Strandburg, Brett Frischmann & Michael J. Madison, 2017).

127. This study received necessary Institutional Review Board approval from Indiana University.

128. These organizations were selected for study because they were reported on with the greatest frequency in the national press the time this study was conducted.

129. *See supra* notes 24–27.

project under the direction of the American Society of Clinical Oncology ("ASCO"), is an early–stage effort to pool cancer treatment data from hospitals and individual practices across the United States.[130] The White House has commended CancerLinQ as an exemplar of the potential for social good that Big Data holds.[131] Project Data Sphere, a second group studied, is a research joint venture that has drawn the participation of several large pharmaceutical companies, including Celgene, Pfizer, and Sanofi.[132] The project, which began in 2012, aims to improve cancer treatment by pooling clinical drug trial data.133 A third organization, CancerCommons, also aims to facilitate innovations in cancer care.[134] Unlike CancerLinQ and Project Data Sphere, however, CancerCommons seeks treatment data from individual patients.[135] A final initiative examined is the Data Alliance Collaborative ("DAC"). The DAC, which was organized by Premier Healthcare in 2013, seeks to pool Big Data methods and processes between member hospitals.[136] For instance, by pooling patient treatment records from different cities, members of the group have developed an algorithm that predicts the likelihood that future patients will be readmitted.[137]

Interview subjects were identified by a variety of means. Some were placed in contact with me by the data pools they worked with. Others were contacted directly because they had been quoted or otherwise mentioned in press accounts of the data pools studied. Some subjects provided introductions to additional interview subjects experienced with pooling health–related data. This second tier of interviewees, which included bioinformaticists at the National Institutes of Health, professors of medicine at leading research universities, and other prominent players in the field, provided context and outside perspectives on the institutions examined. All interview subjects were selected based upon their experience in the field

130. *ASCO CancerLinQ: Learning Intelligence Network for Quality*, AM. SOC'Y OF CLINICAL ONCOLOGY, http://www.cancerlinq.org (last visited Aug. 13, 2017).

131. Press Release, *supra* note 24, at 2.

132. Press Release, Project Data Sphere, CEO Roundtable on Cancer Launches the Project Data Sphere Initiative, A New Data Sharing and Analytic Platform for Cancer Patient Benefit (Apr. 8, 2014), https://www.projectdatasphere.org/projectdatasphere/html/PressRelease/LAUNCH.

133. *Id.*

134. *About Us,* CANCER COMMONS, https://www.cancercommons.org/about/ (last visited Aug. 10, 2015).

135. *Id.*

136. *See Shape the Future of Healthcare Data and Care Delivery Models*, PREMIER, INC., https://www.premierinc.com/transforming-healthcare/quality-improvement-in-healthcare/data-alliance-collaborative/ (last visited Aug. 12, 2017).

137. Telephone Interview with Anonymous Subject #17, member, Data Alliance Collaborative (Sept. 10, 2014).

(e.g., their credentials and work history), and their willingness to participate. All interviews lasted at least thirty minutes, were audio recorded with the permission of the interview subjects, and were later transcribed.[138] Follow–up interviews were conducted with nearly all subjects. Some interview subjects agreed to be identified by name, while others agreed to be quoted only if they were identified as anonymous subjects. This latter group of subjects have been identified in the footnotes anonymously with unique identifying numbers.

An important, and perhaps unavoidable, limitation of this study is that it includes only the insights of individuals who agreed to be interviewed. This means that the study may not capture the full range of opinions that exist on this topic—i.e., that the results presented here are biased in some way. Nonetheless, even if the picture presented here is incomplete, the insights offered are still helpful and relevant to the research question that motivated this study.

Methodologically, this study's ethnographic approach was inspired by the classical IAD framework developed by the Nobelist ethnographer Elinor Ostrom. Aspects of the study were also greatly influenced by the recent adaptation of Ostrom's IAD's framework by "Knowledge Commons" pioneers Katherine Strandburg, Michael Madison, and Brett Frischmann.[139] In practical terms, this entailed asking subjects a semi–structured set of interview questions that fell into the following categories: (i) background industry environment and context; (ii) the characteristics of the data or informational resources being shared, and skills needed to create or prepare these resources; (iii) the "default" status of the data to be shared, (iv) the identities of the firms or institutions participating; (v) the goals and objectives of the data–sharing project; (vi) any institutional governance mechanisms, such as information–sharing rules that members promise to abide by; and, (vii) technological infrastructure.[140]

Three themes emerged from these interviews, each of which is explored in the following subsections. The most significant finding is that the chief impediments to the pooling of cancer treatment data are not the free–rider problems that theory predicts. The pooling of cancer treatment and research data in the United States appears to be significantly impeded by concerns regarding professional, competitive, and reputational standing. The details

138. Several interview subjects participated in this study on the condition of anonymity. These individuals are identified in this article as "Anonymous Subject" followed by a unique identifying number.

139. *See generally* GOVERNING KNOWLEDGE COMMONS, *supra* note 112; OSTROM, *supra* note 112; UNDERSTANDING KNOWLEDGE AS A COMMONS, *supra* note 109.

140. *See* GOVERNING KNOWLEDGE COMMONS, *supra* note 112, at 20–21.

of these concerns are laid out in the sections that follow and are analyzed in Section IV. A second hindrance to data–pooling is the cost of preparing data for exchange, a topic briefly touched upon in Part II. A third hindrance is that potential data contributors are often doubtful that the benefits of sharing data with a pool will outweigh the necessary costs and risks. The possible reach of these findings, and whether they are worrisome enough to prompt policy action, are considered in Section IV of this Article.

Some interview subjects offered global comments that helpfully captured the challenges of pooling cancer treatment and research data. As the CEO of a data-pooling non-profit remarked, "everyone is behaving in an economically rational way because everyone has incentives to not share. Everyone is competing for everything—from patients, to grant dollars, to tenure, to vacations, to promotions."[141] A prominent professor of medicine involved in several oncology data–pooling projects echoed this view, commenting that those who hold valuable data have "every incentive not to share" and that "some of the most important data live at the places that have the least interest in sharing."[142]

## B. COMPETITIVE CONCERNS

Subjects interviewed for this Article reported that many of the institutions that hold valuable cancer–related data are reluctant to share it widely because doing so might cost them reputational harm or a competitive edge. The precise nature of these concerns is contextual, varying from one data holder to another, but the overall result is the same: a decision not to cooperate.

Subjects reported that some hospitals and cancer care centers do not wish to disclose patient treatment data because doing so could publicize unfavorable information about the quality of care their institutions provide. One subject reported that a representative of a large medical institution told him, "the reason we don't want to share this data is that we are afraid people will use it to compare our outcomes with other institutions in an inappropriate way."[143] The subject made it clear that he was paraphrasing this remark but added that it was consistent with his own first–hand observations. Another subject described this phenomenon in more dramatic terms: "Hospitals reason, 'I'm going to get sued as soon as anyone can see how many people died from leaving sponges in bodies.' So they have a disincentive from a liability perspective to share."[144] Another subject

141. Telephone Interview with Anonymous Subject #57 (Aug. 29, 2014).
142. Telephone Interview with Anonymous Subject #42 (Sept. 19, 2014).
143. Telephone Interview with Anonymous Subject #57 (Aug. 29, 2014).
144. Telephone Interview with Anonymous Subject #44 (Sept. 11, 2014).

elaborated by explaining the kinds of valuable information patient treatment data can hold:

> I've seen hospitals reluctant to share [patient treatment] data because of market advantages. Often the information contains financial information. Overall, a lot of healthcare data also has trade secrets embedded in it. It's how you're planning your primary care network to basically act as a referral into your hospital network—that kind of stuff can be figured out by seeing where patients are coming in, and that kind of thing. I've seen a lot of reluctance [to share] that kind of information. And certainly reluctance on cost and charge information, because it can reveal [what the hospital] is getting paid for which procedures. Also, at the doctor level: Doctors are reticent to see patient information shared because it could expose the hospital to greater risks of malpractice. So, there's a lot of worry, and it's totally reasonable.[145]

Subjects also reported that concerns about patient privacy discourage some hospitals and cancer care centers from pooling data. Disclosing private patient data could lead to reputational harm, subjects explained, but also liability under privacy–related laws—most notably, the Health Insurance Portability and Accountability Act of 1996 (HIPAA).[146] "[T]here's this enormous liability risk of brokering access to de-identified data for research when you've been using it identified for quality improvement or for treatment and payment," explained one subject.[147] "That risk really blocks a lot of things."[148] Added another subject, "the big cancer centers, those that are not sharing data, will cite HIPAA … [I]t is a well-intentioned thing to protect patient privacy [but] it has really stymied medical research."[149] Interestingly, several experts suggested that HIPAA provides a plausible excuse for institutions that do not wish to share data for reasons unrelated to privacy, such as reputational concerns. This argument is "particularly hard to argue with," one subject stated.[150]

Subjects reported that pharmaceutical companies harbor similar concerns about reputational or competitive harm. "There are IP concerns when talking to pharmaceutical companies . . . [are] they going to lose

145. Telephone Interview with Anonymous Subject #42 (Sept. 2, 2016).

146. 45 C.F.R. § 164.514(e) (2013) (forbidding institutions from disclosing data that contains names, zip codes, treatment dates, and other related information).

147. Telephone Interview with Anonymous Subject #44 (Sept. 11, 2014).

148. *Id.*

149. Telephone Interview with Anonymous Subject #57 (Aug. 29, 2014).

150. Telephone Interview with Anonymous Subject #42 (Sept. 19, 2014).

something if they give away the data?" one subject stated.[151] The former Chief Product Officer of one effort, Project Data Sphere, elaborated on why some pharmaceutical companies may understandably be reluctant to share "core" clinical trial data with a pool composed of competitors:

> If you share the core, central data, that data may remove a little bit of a competitive edge in certain companies, and the competition among those companies is a crucial part of the model of generating innovation.[152]

This interview subject emphasized, however, that the core competitive data is "just a fraction" of the data, and that pooling of "non-core" data—i.e., data that holds no immediate competitive value—can still "advance the field tremendously."[153] The subject indicated that changes in culture and in corporate governance could open the door to greater sharing of this kind of data:

> There are cultural barriers, there is the fear of competitiveness, and also, sharing data is not built into the policies of all the companies, so all the governance reviews and the decision making are awkward because they are completely outside of the regular work that they have. So those are barriers, you see.[154]

These comments are consistent with at least one recent industry report that concluded, "companies are reluctant to share proprietary information—even when anonymity is assured—for fear of losing competitive advantage."[155]

Subjects also reported that academic researchers, a large and important class of cancer data holders, face strong competitive disincentives to disclose their data with pools. As a professor of medicine at a leading U.S. research university involved with oncology data pooling explained:

> There is not a culture in academia to promote [data] sharing because the culture is exactly the opposite: It's protection of information to keep from getting scooped. The only way to protect yourself is to wall-off or circumscribe the information that you

151. Telephone Interview with Anonymous Subject #29 (Aug. 26, 2014).
152. Telephone Interview with Kald Abdullah (August 29, 2016).
153. *Id.*
154. *Id.*
155. James Manyika et al., *Open Data: Unlocking Innovation and Performance With Liquid Information*, MCKINSEY GLOBAL INST. (October 2013), www.mckinsey.com/business-functions/digital-mckinsey/our-insights/open-data-unlocking-innovation-and-performance-with-liquid-information.

> uniquely have access to and even if you don't do anything with it today at least nobody else is doing anything with it either.[156]

According to this subject, academic researchers often feel so reluctant to share data that they will purposefully obscure it even when a federal grant–funding agency requires its disclosure. The subject called this behavior "data–dumping," explaining, "[i]t's very similar to when there is a requirement to share documents [in the course of a litigation] and you essentially overwhelm the other team with too many documents."[157]

In addition to institutions, medical professionals, and academics, patients themselves may fear that contributing to a data pool could lead to reputational, professional, and pecuniary harm. Subjects explained that patients often worry, for instance, that widespread disclosure of their health data will jeopardize their privacy or negatively influence how employers, financial lenders, or insurers will treat them. "There's a lot of fear around the negative externalities of sharing," one subject explained. "Losing health insurance, losing long term care insurance, losing employment opportunities, being embarrassed, being discriminated against, being unable to find dates, that sort of thing."[158] These comments are corroborated by recent press reports on point.[159] When asked to explain how disclosing one's health data could impact employment, for instance, the subject provided an unsettling hypothetical:

> Let's say that we figure out a set of genetic mutations and variations that give you an 85-percent chance of developing Alzheimer's disease early—before age 50. I'm 42 right now. Let's say I have these mutations and in five years, my genome is

156. Telephone Interview with Anonymous Subject #42 (Sept. 19, 2014). These comments are consistent with the observations of Elinor Ostrom and her collaborators. AMY R. POTEETE, MARCO A. JANSSEN & ELINOR OSTROM, WORKING TOGETHER: COLLECTIVE ACTION, THE COMMONS, AND MULTIPLE METHODS IN PRACTICE 263–64 (2010) ("Some scholars have opposed blanket data-sharing policies out of a concern that such policies would either disadvantage research that relies on less standardized forms of qualitative data, or compromise the anonymity of respondents who provide sensitive information.").

157. Telephone Interview with Anonymous Subject #42 (Sept. 19, 2014).

158. *Id.*

159. *See, e.g.*, Stephen F. DeAngelis, *Patient Monitoring, Big Data, and the Future of Healthcare*, WIRED (Aug. 2014), http://www.wired.com/2014/08/patient-monitoring-big-data-future-healthcare/ (reporting a reluctance on the part of patience and opining that "[i]t is more understandable why people would be reluctant to share personal health information in countries like the U.S. where it could be used to justify significant increases in health insurance costs.").

> [available to potential employers] online. Who's going to hire me?[160]

The subject emphasized that *perception* of risk, even if unfounded, may be enough to discourage data sharing.[161] As a result, useful data from healthy individuals may be particularly difficult to obtain. "People who self-identify as healthy have very few incentives to share their health data unless they buy into it philosophically," commented one subject whose field of work focuses on facilitating patient data sharing.[162]

Other subjects expressed the opinion that it is reasonable for patients to have such concerns. A doctor and professor of medicine with prior involvement in an oncology data pool stated, "You know, insurers of course are very interested in having their hands on all of the information because it allows them to know [what] rates to charge."[163] Another subject explained, troublingly, that masking an individual's identity in compliance with HIPAA does not necessarily reduce privacy risks because "[r]e-identifying patients is becoming very easy with the right computer program, even off of genomic data sets."[164] Most subjects explained that, in light of these concerns, patients are likely to either not share their data at all, or to do so with only very highly trusted brokers.

The data pools examined are addressing these widespread perceptions of risk by tailoring their approaches in interesting ways. For instance, Project Data Sphere requires its licensees to agree that they "will not seek, and will not support any third party's effort to seek, patent protection in any jurisdiction for any research procedure or research design that results from . . . use of the Data or User Contributions."[165] The group is also attempting to minimize the competitive risk pharmaceutical firms perceive by collecting only a sub–category of clinical trial data that holds little commercial value for its members but may, once aggregated, yield useful results. "We did it in a way that was relatively low risk by asking for the comparator arms [and] not the experimental [arm]," explained a senior executive with the project.[166] "So you can keep your IP close at hand, but

160. *Id.*

161. *Id.*

162. Telephone Interview with Anonymous Subject #44 (Sept. 11, 2014).

163. Telephone Interview with Anonymous Subject #51 (Aug. 26, 2014).

164. *Id.*; *see generally* Paul Ohm, *Broken Promises of Privacy: Responding to the Surprising Failure of Anonymization*, 57 UCLA L. REV. 1701 (2010) (calling attention to this problem).

165. *Project Data Sphere Online Service User Agreement*, PROJECTDATASPHERE.ORG (on file with the author).

166. Telephone Interview with Anonymous Subject #29 (Aug. 26, 2014).

the opportunities with the data itself are tremendous. I mean, you can work on standards, you can work in how data are collected, you can look at end–point, you can look at progression of end–point selection, you can look at subpopulation . . . you can do all kind of things."[167]

Other interviewees expressed doubts, however, about the likely efficacy of these approaches. Referring to Project Data Sphere's decision to collect only a narrow category of data, one interview subject commented, "I am not trying to say anything negative, but what are they sharing? The data on the control arms for small drugs? How remote can you be?"[168] This subject later amended his comment, however, stating, "But it may have value to patients. In fact, sometimes controls and failed trials can sometimes be more interesting than the trial arms."[169] Not referring to Project Data Sphere, another subject stated that *any* data pool composed of only one type of data risks missing the grand opportunity of Big Data. "If I could [pool] prostate cancer patients' [data] together, I'd understand the story of prostate cancer better," the subject commented, "But that's not the real deal. The real deal is when you find the intersection between many things that otherwise could not be intersected."[170] The subject went on to describe a recent academic study that uncovered a correlation between cancer and certain environmental factors by pooling hospital records with weather data.[171]

Ironically, competitive concerns may also discourage data pools *themselves* from sharing data. Referring to recent efforts to gather cancer treatment data, one subject explained:

> So these organizations [pools] don't necessarily want to share with each other, because they're competing for dollars and oxygen in the community; They're competing to be 'The Group,' right? And so ironically, although it would be better for the people that they purport to serve that they all share data with each other, frequently they don't, right, either for competitive reasons or because it doesn't occur to them.[172]

Other subjects consistently commented that it has become common for burgeoning data aggregators in this field to trumpet the virtues of sharing data to the outside world while maintaining high barriers for researchers who wish to access the data. As one subject remarked, "This is really about externally stating that sharing is important but internally creating hurdles

167. *Id.* ("The majority of the data are phase-three cancer clinical trials, so it is hard end-point data from blood pressure to PSA readings, to basically everything: end points, death, life . . . various things.").

168. Telephone Interview with Anonymous Subject #71 (Aug. 29, 2014).

169. *Id.*

170. Telephone Interview with Anonymous Subject #42 (Sept. 19, 2014).

171. *Id.*

172. Telephone Interview with Anonymous Subject #44 (Sept. 11, 2014).

that make using data nearly impossible. Because now you can, as you set the threshold, gate when people cross over the threshold."[173] Another subject explained that overcoming the high barriers set by data aggregators led him to seek data from individual patients. His organization's goal, he stated, is to "[g]et it out of those silos."[174]

### C. COSTS OF OBTAINING AND PREPARING DATA FOR POOLING

Interview subjects reported that accessing, organizing, and preparing data for exchange carries significant upfront costs. Before primary holders of useful health data—hospitals and specialty care centers, doctors, and academic research institutions—can pool data, they must translate it into common formats, confirm its accuracy, correct any errors, and obfuscate details that could be used to identify individual patients. In addition to identifying these technical hurdles, subjects reported a variety of institutional, cultural, and contractual barriers that also discourage the pooling of cancer treatment data.

Patient treatment records constitute one of the most important forms of data sought by the groups interviewed by this study. These are records of care that patients receive from healthcare providers such as hospitals. An interviewee involved with CancerLinQ helpfully divided this type of data into two broad categories: "structured" and "unstructured."[175] Structured patient treatment data, this subject explained, includes objective, machine–recorded facts such as "laboratory test results or the dosages of medicines prescribed, or patient vital signs," whereas unstructured data is generated and recorded more casually and based upon more subjective observations—a clinical physician's handwritten observations, for example.[176]

Healthcare providers typically store structured and unstructured data in patients' electronic health records ("EHRs"). Large hospitals and cancer care centers contract with outside database vendors ("EHR vendors") to store and manage access to patient EHRs.[177] At least some structured data contained in a patient's EHR may also be reflected within a hospital's billing records or in an insurer's customer records: "If the doctor bills for their services, all that sort of information gets converted, if you will, into a

173. Telephone Interview with Anonymous Subject #42 (Sept. 19, 2014).
174. *Id.*
175. Telephone Interview with Richard L. Schilsky, M.D. (Aug. 26, 2014).
176. *Id.*
177. *Id.* This subject explained that EHRs often do not contain all records generated in the course of treating patients: "[I]t's not all completely integrated into the electronic medical records so a lot of it is returned to the doctor in the EHR but some of it is returned to original reports that have to be scanned into the EHR and things of that sort." *Id.*

lot of different kinds of codes that are used to submit the claim to insurance," one subject explained.[178] The overall picture conveyed by subjects is that patient treatment information is usually stored in multiple places and overseen by different stewards, the most important of which are EHR vendors and healthcare providers.

A former president of ASCO involved with the launch of CancerLinQ explained that the business practices of EHR vendors pose a challenge to data–pooling initiatives. "You need to have an EHR vendor or an institution that is willing to share the data," he explained, and "[a] silo mentality is associated with those vendors . . . [T]hey are a notoriously proprietary bunch that are not good at sharing—even within their own system[s]."[179] This problem is aggravated, the subject explained, by the fact that hospitals have few choices when selecting EHR vendors to work with: "A fairly small number of corporations are responsible for the electronic health records in the United States," he said, adding, that these vendors do not store data in common or widely accessible formats.[180] Other subjects made consistent statements about the difficulty of obtaining data from EHR vendors. Some explained that even when data is obtainable, it is not immediately usable.[181] Because EHR vendors store data in proprietary digital formats, some subjects explained, a hospital seeking to share patient data with a data pool must first translate all data it gathers into common, widely–readable digital formats.[182] This involves enlisting engineers with expertise in formatting data to perform the translation.[183]

These findings are consistent with recent press accounts. In a September 2015 industry news report, a doctor who works at a medical practice involved with CancerLinQ commented, "What has happened is that EHR systems don't communicate with each other. Vanguard practices are having to dedicate time and resources, including my entire IT department, to be able to adapt the technology in order to implement CancerLinQ . . . Other EHR vendors are flat-out refusing or making it prohibitively expensive to make the systems communicate with each other."[184]

178. *Id.*

179. Telephone Interview with Anonymous Subject #51 (Aug. 26, 2014).

180. *Id.*

181. Telephone Interview with Anonymous Subject #44 (Sept. 11, 2014).

182. Telephone Interview with Richard L. Schilsky, M.D. (Aug. 26, 2014) (discussing the fact that EHR vendors often store patient data in different formats).

183. *Id.*

184. *See* Frank Irving, *ASCO Calls Out EHR Interoperability as Barrier to CancerLinQ*, XTELLIGENT MEDIA (Sept. 16, 2015), http://healthitinteroperability.com/news/asco-calls-out-ehr-interoperability-as-barrier-to-cancerlinq (discussing

Relatedly, a leading commentator and advocate for health data sharing explained that many EHR vendors contractually forbid the hospitals they serve from sharing data with outside institutions: "they [hospitals] are wrapped up in contracts with their technology vendors—especially their electronic health record vendors—where only the EHR vendors have rights to go outside the hospital with data," he explained.[185] Independent research into the practices of EHR vendors corroborates this statement, revealing that many vendors indeed impose such contractual restrictions.[186] Other subjects echoed this problem, but expressed optimism that such restrictions would lessen over time as a result of certain provisions of the Patient Protection and Affordable Care Act of 2010 that require EHR vendors to make patient data more portable.[187]

The difficulty of accessing data from large EHR vendors has led some nascent data pools to approach smaller practices or academic institutions, where treatment data may be relatively easier to gather. The president of a private oncology practice group explained that CancerLinQ "looked at private practices to start this project rather than academic institutions [because] the data's probably more easily extractable from the private practice EHRs and trying to get discrete information out of a big hospital system can be very tedious."[188] Other subjects consistently reported that data held by smaller private practices is sometimes subject to fewer technical and contractual barriers.

Apart from the barriers presented by EHRs, healthcare providers seeking to contribute patient treatment data to a pool also must carefully remove any information that might identify an individual patient. HIPAA, mentioned earlier, forbids institutions from disclosing data that contains names, zip codes, treatment dates, and other information that could identify an individual patient.[189] Subjects explained that simply stripping these identifiers from a dataset can remove useful information, however, such as the length of time that a patient was treated, or the fact that the same patient received treatments at different institutions.[190] To address this issue, some

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CancerLinQ's potential and offering recommendations to help eliminate information blocking as a barrier to interoperability).

185. Telephone Interview with Anonymous Subject #44 (Sept. 11, 2014).

186. *Id.*

187. Telephone Interview with Anonymous Subject #51 (Aug. 26, 2014).

188. Telephone Interview with Anonymous Subject #71 (Sept. 8, 2014).

189. 45 C.F.R. § 164.514(e) (2013).

190. *See, e.g.*, INFO. COMM'R'S OFFICE, ANONYMISATION: MANAGING DATA PROTECTION RISK CODE OF PRACTICE 83–84 (Nov. 2012), https://ico.org.uk/media/1061/anonymisation-code.pdf.

health care institutions examined in this study hired engineers to "mask" or obfuscate personally–identifying data with "dummy values" (random numbers) in a manner that preserved underlying information.[191] For instance, engineers could consistently replace a patient's name with unique random numbers so that the same patient or a group of patients could be examined over time.[192] Likewise, a patient's treatment dates might be offset by a consistent period of time—say, 7 weeks.[193] This allows data scientists to know how often a patient was seen and the total period of time the patient was treated. A data scientist involved in this practice explained that these examples are simplified: masking data to preserve privacy requires a nuanced understanding of the content of the data, the ways in which it may be used in the future, and the harm that could result from disclosure of personally identifying patient information.[194] Because the process requires expert judgment, it cannot be automated.

Some subjects reported that manipulating data in this manner can be a costly barrier to sharing data. "I think pretty much everyone in the healthcare community [and the research community] views HIPAA laws as a hindrance rather than a help to most patients," commented one subject.[195] Complying with HIPAA imposes a cost, he explained, "basically because it requires you to get an enormous amount of approval that adds immensely to the expense of these things."[196]

Yet another fundamental upfront cost lies in locating critical data in unstructured sets of information. According to a prominent academic researcher with deep involvement in oncology data pooling, some of the most important oncology data can only be identified by and recorded manually and with great effort. This subject offered a fascinating illustration of this problem by explaining the role that condolence cards play in relaying mortality information:

> It's not just a data-gathering problem. The problem is that, even if you put data together in a soup, there can be huge holes of certain information points that live in doctors' handwritten medical notes. Take condolence cards, for example. As a country, we have the social security death index, the national death index—all of these ways of finding out whether someone has died. The social security death index used to be a mandated activity and now it is not, so

191. *See, e.g.*, Mattioli, *supra* note 13, at 566–68 (discussing data masking in depth).

192. Telephone Interview with Josh Mann, Assistant Director of Oncology Technology Solutions at American Society of Clinical Oncology (Oct. 8, 2013).

193. *Id.*; *see also* Ohm, *supra* note 164, at 1703–05.

194. *See supra* note 163.

195. Telephone Interview with Anonymous Subject #51 (Aug. 26, 2014).

196. *Id.*

> it's a decaying data set, so it only reflects some proportion of people—probably only seventy percent of deaths. But if you want to do research, you need to know with certainty whether someone is alive or not. So, I work with a dataset that is culled from obituaries and funeral homes. That's the main way I get mortality data. It turns out that even with this method, you still only find about ninety percent of the mortality information you need. But if you go into the medical record, and you read the case notes, you see the note from the doctor that says, "I discussed hospice with the family today." Now you know something is going on. You find [a copy of] the condolence card that says, "I am so sorry, Mrs. Jones, to know about what happened to Fred." . . . It actually might be the condolence card that is the best symbol that this patient has died. [Sometimes] we have no other place to figure out that the patient has died. So one of the things that is becoming apparent in the cancer data space is how important this unstructured data morass is. It's there; as clinicians, we know it; but it doesn't get captured in a useful way. [At a point in time about five years ago], we believed that all we needed to do was collect data and we could make sense of it later. That hasn't been borne out. The promise of natural language processing as a scalable solution to turn this kind of unstructured information into meaningful data points is just not bearing out. In oncology, many of the critical data points that you need for research live in places that are completely unstructured.[197]

Upfront costs also appear to hinder the pooling of useful data held by pharmaceutical companies. A scientist involved with Project Data Sphere hypothesized that in the course of his work, he might encounter "five companies collecting information on prostate cancer patients and they are all doing it in a little bit different manner . . . there are little nuances that may be different between my company, and another company, and an academic organization."[198] An expert involved with this effort explained that such differences create an upfront cost, because all data must be translated into a common format.[199] The Chief Product Officer of Project Data Sphere explained that it could take "a programmer and a statistician . . . about 40 to 80 hours" to prepare just one data set for inclusion.[200] Although this amount of work is not tremendous, he explained, "if you . . . scale that up . . . it impacts resources."[201] He later commented that data

197. Telephone Interview with Anonymous Subject #42 (Sept. 9, 2016).
198. Telephone Interview with Anonymous Subject #29 (Aug. 26, 2014).
199. *Id.*
200. Telephone Interview with Kald Abdullah (Aug. 27, 2014).
201. *Id.*

preparation is perhaps "the most significant obstacle" to forming effective data pools in his view.[202]

In summary, the cost of preparing cancer treatment and research data poses a significant barrier to pooling it. These costs stem from hiring and paying engineers and data experts to translate data into useful formats, masking potentially personally–identifying information, searching for useful data points within large sets of unstructured data, and related tasks such as identifying and correcting errors in the data. Care providers may face the additional challenge of obtaining the data from EHR vendors in the first place.

### D. UNCERTAIN RETURNS

Subjects interviewed for this study reported that a major challenge in pooling cancer treatment and research data is convincing data holders that their cooperation will yield direct benefits that outweigh the foregoing risks and costs.

The "what's in it for me" question, as one subject termed it, appears to be one of the central conundrums that data pools in the healthcare industry appear to face.[203] As the former Chief Product Officer of Project Data Sphere explained,

> I think there [are] two questions that you need to really work hard to convince them [potential contributors of data]. 'What is the value of sharing this data?'—that's one question. The other question is, 'What is the value *for me* to share my data?[204]

A prominent academic researcher consistently reported that the message some data–pooling projects are communicating to data holders is, in effect, "it's good for *the world* [if you] share your data [because] somebody else can do something with it."[205] But this message, she explained, is less persuasive than "saying you should share your data so that you can collaborate . . . and it's even another . . . move to say 'share your data because it's actually in the sharing that the unique intellectual property comes,'" she continued.[206] "Those degrees of separation—each one requires a step outside the box."[207] A subject involved with Project Data Sphere commented, "I think the biggest problem . . . is getting more data and

202. *Id.*
203. Telephone Interview with Anonymous Subject #29 (Aug. 26, 2014).
204. Telephone Interview with Kald Abdullah (Aug. 27, 2014).
205. Telephone Interview with Anonymous Subject #42 (Sept. 19, 2014).
206. *Id.*
207. *Id.*

convincing people that it is valuable . . . Why am I going to put resources behind this when I am not sure what I am going to get out of it?"[208]

A potential solution that some data–pooling groups are experimenting with is to promise to share useful statistical information with participating data holders. CancerLinQ, for example, plans to report to member hospitals summaries of how their quality of service measures up to that of other members and to national standards.[209] The Chief Medical Officer of ASCO explained,

> We will be able to return to the physician on a regular basis a dashboard report that shows what is the quality of their performance against . . . standard measures . . . . Eventually we will be able to show them how the outcomes of their patients compared to the outcomes of other similar patients in other similar practices. . . . We think that will be a big incentive to them to join.[210]

According to an executive involved with the project, Project Data Sphere is considering offering a similar incentive, in the form of sharing "use cases" that would allow researchers to better design and evaluate their clinical trials.[211]

Some data holders interviewed were optimistic about this approach. "I mean, any quality metrics that you get back to your practice are always helpful to keep you ahead of the curve and to make you practice better," commented the president of a private oncology practice group.[212] Moreover, there may be financial incentives for health care institutions to know how well they measure up to their competitors. Health providers "can use that information to report to insurers what their quality is, how it compares to other physicians," explained the CIO of ASCO.[213] Several subjects explained that the Affordable Care Act's measures for "accountable care," under which participating healthcare providers are reimbursed based upon the relative quality of care they provide, could make the sort of metrics

208. Telephone Interview with Anonymous Subject #29 (Aug. 26, 2014).
209. *Id.*
210. Telephone Interview with Richard L. Schilsky, M.D. (Aug. 26, 2014).
211. Telephone Interview with Anonymous Subject #29 (Aug. 26, 2014) ("We are working on several very interesting projects to publish use cases that can evaluate the validity of clinical-trial data or perhaps predict the potential outcome of phase-three data based on phase-one and phase-two responses.").
212. Telephone Interview with Anonymous Subject #71 (Sept. 8, 2014).
213. Telephone Interview with Richard L. Schilsky, M.D. (Aug. 26, 2014).

CancerLinQ plans to share an effective enticement.[214] In other words, healthcare providers that operate under the accountable care model should wish for more information describing how their quality of service compares to that of their competitors. It is not yet clear whether this incentive will lead to greater data pooling, and in turn, advances in cancer treatment.

Another source of uncertainty stems from a lack of clarity over how profits or valuable patent rights generated by a data pool would be divided among those who contribute to it. "Suppose a new analytical method took a long time to develop," one respondent hypothesized, "and it's significantly predictive and different than what you can buy in the commercial space . . . . Someone is going to want to get paid for that because it took a long time to build . . . . You're going to want to get something back out of that."[215] At the time of this writing, none of the data pools examined have a system in place for dividing such royalties among data contributors.[216]

Lastly, some subjects explained that cultural forces that oppose data disclosure make the potential benefits of pooling all the less certain. Calling back to a theme discussed earlier in this Article, one subject reported that within medical research, cumulative innovation is valued more highly than recombinant innovation: "Science is incredibly reductionist and 'looking down' as opposed to 'looking out and across.' That's one of the big differences. And we celebrate the science that looks down, and we call the science that's collaborative dumb. That's part of the problem."[217] Large hospitals and research centers may similarly fail to see the benefit of data pooling. The CEO of a nonprofit data–sharing group commented:

> We have approached many, many medical institutions, large cancer centers, especially the big ones . . . They are very, very protective of their data. Because they think they are big enough to be able to not need anyone else's data, so they won't share their data . . . It is strongly in the culture.[218]

214. *See generally* Patient Protection and Affordable Care Act, 42 U.S.C. § 18001 (2010); *see also* OLIVER WYMAN, TRACKING THE GROWTH OF ACCOUNTABLE CARE (Sept. 2013), http://www.oliverwyman.com/content/dam/oliver-wyman/global/en/files/archive/2013/OW_HLS_ACO_maps.pdf (providing a helpful summary and map displaying these accountable care organizations).

215. Telephone Interview with Anonymous Subject #17, member, Data Alliance Collaborative (Sept. 10, 2014).

216. For examples of how patent pools divide royalties, see Mattioli, *supra* note 13.

217. Telephone Interview with Anonymous Subject #42 (Sept. 19, 2014).

218. Telephone Interview with Anonymous Subject #57 (Aug. 29, 2014).

## IV. ANALYSIS AND RECOMMENDATIONS

The foregoing study reveals several factors discouraging the pooling of cancer treatment and research data. Some of these factors, such as concerns about professional, competitive, and reputational standing, are not widely predicted by theory. This Part explores the policy implications of these findings, and suggests possible avenues for future policy work.

### A. IMPLICATIONS FOR INNOVATION POLICY

Should policymakers be concerned by the challenges that private data pools face? To answer this question, it is helpful to first consider the specific problems this study uncovers, and how far they might reach. Why might we think that this study reflects a problem that reaches beyond a few institutions in a single industry?

#### *1. Summarizing the Problem*

The problem uncovered by this study can be stated simply: the pooling of cancer treatment and research data—widely thought to be a necessary precondition for certain innovations in cancer care—appears to be hindered by collective action problems playing out between data holders and nascent pools. Some of the most important impediments are not neatly reducible to simple "free–rider" dilemmas predicted by legal scholars and economists.

To consider the possible reach of the data–pooling problem, it is helpful to examine its causes. This problem is spurred in part by data holders' concerns regarding professional, competitive, and reputational standing. Some healthcare providers appear to be reluctant to disclose treatment data to a pool because they fear that doing so will lead to negative publicity and a reduced inflow of patients in the future. Sharing data with a pool could reveal a hospital's relatively poor record of patient outcomes, for example. Similar concerns appear to discourage the pooling of some kinds of clinical trial data held by pharmaceutical companies. A drug firm might hesitate to exchange certain data too widely for fear that a competitor could benefit from information revealed by that data. Academic researchers appear to face similar disincentives. In a profession where research data can pave the way to publications, tenure, and grants, researchers at universities may have little motivation to share the data they collect. To the contrary, according to subjects interviewed, academic scientists tend to guard their data jealously.[219] Although some grant–funding agencies such as the NIH require data to be disclosed, subjects interviewed for this study explained

219. *See supra* Section II.B.

that such requirements are often subverted through strategic "data dumping."[220] (These observations square with recent empirical work on secrecy among clinical biomedical researchers.)[221] Finally, individual patients may believe that sharing their health data too widely could change how insurers, employers, and others view them, possibly opening the door to discriminatory treatment.[222]

Alongside such concerns are the costs of preparing data. For both legal and practical reasons, data holders often must manipulate their data before disclosing it. As several subjects explained, HIPAA creates a risk of liability for health care providers that share patient treatment information.[223] Care providers who wish to minimize that risk without rendering their data useless to research efforts must manipulate it in various ways prior to disclosure (e.g., "masking" personally identifying information, etc.). This may involve hiring highly skilled (and, consequently, highly paid) engineers.[224] Evidence from this study indicates that such costs can discourage pooling.[225]

Electronic health record vendors appear to represent a related, but distinct problem. These companies sometimes intentionally make data access and reuse difficult as a deliberate business strategy—i.e., as an attempt to "lock in" clients. Some may do so by storing data in proprietary formats and by placing contractual restrictions on how their clients (i.e., care providers) may use the data they store. Interview subjects indicated that even when care providers are able to obtain data from electronic health record vendors, they must incur costs translating it into a standard, widely readable format before submitting it to pools.

Data held by pharmaceutical companies also must be prepared prior to sharing—although for slightly different reasons. Unlike healthcare providers, which hire outside vendors to store patient treatment data, private pharmaceutical companies can easily access the data they generate in the course of clinical trials because they store it themselves. This study

220. *Id.*

221. Wei Hong & John P. Walsh, *For Money or Glory?: Commercialization, Competition, and Secrecy in the Entrepreneurial University*, 50 SOC. Q. 145 (2009).

222. There are some notable counter–examples, however, including a cancer survivor who received high–profile press coverage for disseminating his treatment data widely. *But see*, Steve Lohr, *The Healing Power of Your Own Medical Records*, N.Y. TIMES (March. 31, 2015), https://www.nytimes.com/2015/04/01/technology/the-healing-power-of-your-own-medical-data.html.

223. *See supra* Section II.B.; Section III.A.

224. *See supra* Section II.B.; Section III.A.

225. *See, e.g.*, *supra* notes 170–77 and accompanying text. This discussion lays out the character of such costs and includes comments from an interviewee (note 177) who explained their significance.

indicates, however, that different pharmaceutical firms record and store their data differently. As a result, any effort to pool cancer treatment data must include a plan for translating it all into a common format.

*2. Assessing the Problem's Possible Reach*

If policymakers are to develop solutions to the foregoing problem, they must have a clear sense of the problem's possible reach. As explained earlier, the purpose of this study was not to conclusively prove or disprove the existence of a widespread data–pooling problem. Rather, this study's more modest goal was to investigate whether such a problem, as suggested by theory, is affecting an important field of research. It would be imprudent to assume that the factors that discourage the pooling of cancer treatment and research data will similarly discourage *all* Big Data efforts.[226] How far, then, might the problem reach? A rigorous empirical answer to that question would require similar studies of other settings where data pooling is being attempted. This Article hopes to motivate other scholars to conduct such studies. But until that work is done, it is possible to draw some informed deductions from this study.

At the very least, the problems uncovered by this study appear to present a problem for Big Data efforts in the field of cancer research. This conclusion is based on the observation that the concerns and costs uncovered by this study do not appear to be unique to the specific institutions examined. In accordance with the IAD research framework, interview subjects were deliberately asked to comment on the broader environment in which the pools examined operate. The sources of the problem clearly appear to be more general, and rooted in the perceptions of individuals and dynamics of culture: concerns about patient privacy, the competitive need to draw customers and patrons, reputational interests, the unstandardized formats in which data of some kinds is often stored. Based upon this observation alone, it seems reasonable to expect *other* private efforts to pool cancer treatment data to be susceptible to similar challenges.

The concerns and costs uncovered by this study also do not appear to be unique to cancer data. Stated differently, subjects interviewed did not suggest that there is anything unique about the *content* of cancer treatment data, or the *processes* by which such data is recorded and stored that makes pooling it difficult. Rather, the problem stems from the types of institutions involved, the environment in which they operate, intrinsic qualities of health–related data, and bodies of law that apply to such data.

226. As explained earlier, the decision to focus this study on cancer treatment data was motivated purely by the fact that, at the time of this writing, cancer treatment is a focus of activity and investment among proponents of Big Data.

It seems reasonable, then, to expect that attempts to pool data related to the treatment of other health conditions to be affected by the same concern. Such hypothetical data pools—if they were to form in the future—might include new kinds of data holders, of course. In addition to hospitals, pharmaceutical companies, academic researchers, and individuals, the manufacturers of smartphones and other personal medical devices hold a wealth of useful health–related data. These new companies could introduce new dynamics, new concerns, and new possibilities, of course. But there is no reason to expect they would not be subject to some of the same barriers to data pooling encountered by the firms and institutions studied here.

Could similar problems hinder data–pooling in other industries altogether? Possibly. As explained earlier, an important and somewhat surprising fact uncovered by this study is that cancer treatment data holders are concerned about professional, competitive, and reputational standing. These concerns are motivated by a common idea—namely, that a data holder's data could, at some future time, reflect something unfavorable about them or harmful to them.[227] This anxiety seems particularly timely. A hallmark of Big Data is its power to reveal surprising insights from data generated for no particular purpose. In an age where, as Paul Ohm recently suggested, "everything might reveal everything," it would be unsurprising to learn that data holders of many kinds worry about what their data might reveal about them.[228] This could have important outcomes in developing industries where data pooling could be helpful, but could also reflect poorly on data holders—telemetry and collision data from autonomous vehicles, for instance.

To sum up, the problems uncovered by this study are likely to impact not only cancer data–pooling efforts, but also related efforts to pool health data of other kinds. Moreover, there is at least a basis to expect similar general problems to develop in other industries and research settings where Big Data might soon be embraced.

### *3. Considering the Problem's Policy Implications*

The introduction to this Article explained why data pooling could, in theory, present a problem for policymakers. That explanation focused on two innovation policy goals: first, the federal government's targeted

227. *See supra* Section II.B. As explained earlier, legal scholars such as James Anton and Dennis Yao have highlighted the role that competitive concerns can play in discouraging information exchanges in the context of standard setting. *Id.*; *see also infra* note 231 and accompanying text (referring to concerns over anticompetitive information sharing served as an animating force behind federal legislation).

228. Ohm & Peppet, *supra* note 71.

funding of Big Data research projects; second, the government's broad goal of encouraging innovation through the patent system.

It is clear why the problem uncovered by this study is relevant to the government's investments in Big Data research. As mentioned earlier, federal agencies have committed over $200 million to help develop new methods of gleaning insights from enormous volumes of data. If the private entities that hold some types of data—at least cancer treatment and research data—are unable or unwilling to assemble such volumes of data in the first place, then the full potential of the government's investments in Big Data might go unrealized.

The problem uncovered by this study also appears to have a bearing on federal innovation policy as expressed through intellectual property law. The reasoning behind this conclusion is straightforward: a central purpose of the patent system is to encourage technological progress. Big Data algorithms can enable technological progress of many kinds, and they are also a category of subject matter theoretically eligible for patent protection (even in light of doubts cast by *Alice* and its progeny). If a precondition for the development of such inventions is unmet, then policymakers could view the result as a subversion of the patent system's goals. The foregone innovations could also be described in economic terms, as representing a drop in dynamic efficiency.

Policymakers may wish to correct this problem by seeking to actively encourage data pooling. The U.S. government has a history of encouraging the exchange of technological information for the purpose of fostering innovation. Patent pools have often formed as a result of governmental intervention.[229] On the other hand, the patent pools that the government has encouraged served to untangle knots that the government had arguably created in the first place—i.e., by apportioning patent rights that developed into thickets. By contrast, the data held by private institutions like those examined here is not a form of property created by the government, nor does it enjoy robust intellectual property protections. Opponents of policy intervention might argue, then, that data pooling is not the government's problem to solve because the government played no direct role in creating it.

229. Moreover, patent pools that *have* formed without state intervention have overwhelmingly been geared toward decreasing the cost of producing existing technologies rather than fostering the development of new ones. David W. Van Etten, *Everyone in the Patent Pool:* U.S. Phillips Corp. v. International Trade Commission, 22 BERKELEY TECH. L.J. 241, 254 (2007) (describing express motivations of various actors who formed patent pools without state intervention).

There are other examples of the government stepping in to encourage the sharing of technological information, however. Standard–setting—a process that necessarily involves technological information–sharing—has been encouraged by the government in various ways.[230] The National Cooperative Research and Production Act (NCRPA) is a federal law passed in 1984 that reduces antitrust liability for certain research consortia that make their activities known to the Department of Justice and the Federal Trade Commission.[231] The law is "designed to promote innovation, facilitate trade, and strengthen the competitiveness of the United States in world markets."[232] These examples suggest that a proposal designed to encourage the pooling of data could succeed in being passed into law.

## B. POLICY RECOMMENDATIONS

The recommendations and suggestions presented in the paragraphs that follow help to show the value of ethnographic studies like the one presented in Part III of this Article. By understanding how a collective action problem affects an important area of research, policymakers and scholars alike can develop informed solutions.

It is helpful to first touch upon an avenue of policymaking that could present special challenges: exclusive rights. One might conclude that data pooling could be encouraged through new laws that imbue scientific and industrial data with intellectual property–like protections—so–called *sui generis* data protection. This idea is a perennial subject of policy debate and it has an intuitive appeal. Like copyrightable and patentable subject matter, useful scientific and industrial information is costly to create, easy to copy, and subject to free–rider problems. With the power to exclude any and all unwanted users, data holders might be more willing to enter into exchanges.

Some leading commentators have argued persuasively that *sui generis* intellectual property protection for data might actually *reduce* the level of

230. *See generally supra* Part III.

231. Antitrust law's potential chilling effects on information sharing led policymakers in 1984 to pass The National Cooperative Research and Production Act ("NCRPA"). *See* James J. Anton & Dennis A. Yao, *Standard-Setting Consortia, Antitrust, and High-Technology Industries*, 64 ANTITRUST L.J. 247, 247–49 (1995); U.S. DEP'T OF JUSTICE & F.T.C., *Antitrust Guidelines for Collaborations Among Competitors*, *reprinted in* 4 Trade Reg. Rep. (CCH) ¶ 13,161, at 1 (2000), http://www.ftc.gov/sites/default/files/documents/public_events/joint-venture-hearings-antitrust-guidelines-collaboration-among-competitors/ftcdojguidelines-2.pdf (exploring the "likelihood of anticompetitive information sharing").

232. *Id.*

innovation in society, however.[233] Pamela Samuelson and J.H. Reichman, most notably, explained that such laws could give database holders the power to control access to basic scientific research materials.[234] This, they argued, would dampen research and "undermine the competitive ethos on which market economies depend."[235] Current law is consistent with this view. Although Congress has regularly considered data–protection bills since the 1990s, none gained sufficient political goodwill to be enacted into law. But more specifically, this study does not suggest that a lack of property protections is the central reason that data is not being widely shared. There may simply be new and more effective ways of encouraging data pooling.[236]

A second threshold consideration relates to public versus private data. Although this Article is focused primarily on data held in the private sector, it is important to note that a wealth of health data in is funded by government institutions such as the NIH. Arti Rai and Rebecca Eisenberg have explored how such public actors can helpfully influence the pooling of—for instance—federally–funded biomedical data.[237] More recently, Rai has explored the role of risk regulators in the data–pooling context, as well as how some private sector data pooling has been encouraged by threats of regulatory action—her observations, insights, and recommendations are deeply relevant to the problems examined in this Article.[238]

It is also helpful to note that national governments have sometimes worked directly with private companies to create vast databases related to health information. As Peter Lee has documented, one of the most widespread was a joint effort between the Icelandic government and a private company in the 1990s to build a database of "clinical records, DNA,

233. For a valuable related exploration of the merits of property rules versus liability rules with respect to information, see Mark A. Lemley & Phil Weiser, *Should Property or Liability Rules Govern Information?*, 85 TEX. L. REV. 783 (2007).

234. *See, e.g.*, Reichman & Samuelson, *supra* note 119, at 95–113.

235. *Id.*

236. In earlier work, I explored the idea of offering limited exclusivity in data as a means to encourage the disclosure of methods by which data was collected and prepared—i.e., metadata—but that approach addressed a problem that occurs in settings where the use of the data is unknown by the entity collecting and sharing it. The data holders examined in this study, by contrast, are aware of the types of research uses the data pools examined have. As a result, the solution seems unhelpful.

237. Arti K. Rai & Rebecca S. Eisenberg, *Bayh-Dole Reform and the Progress of Biomedicine*, 66 LAW & CONTEMP. PROBS. 289 (2003).

238. Rai, *supra* note 100.

and family histories for the entire country."[239] As Lee explains, this plan was controversial.[240] Because there seems to be a desire within the oncology treatment community to form data pools, it might be most desirable for the government to encourage cooperation through nudges, rather than managing a data pool directly or through such a partnership. More direct involvement may be helpful in other industrial settings, however.

A more hopeful focus of future policy efforts could relate to standards. As discussed earlier, a major obstacle to pooling health data is the cost of conforming patient treatment records into common formats. The federal government could reduce these costs by encouraging the standardization of electronic health records. The best approach is probably not a direct mandate that all healthcare providers and electronic health record vendors adopt a specific set of standards. The federal government mandates standards in only limited settings—the side of the road that we drive on, or permissible uses of radio spectrum frequencies licensed to private users, for instance.[241] As a general policy matter, the government disfavors mandating the adoption of specific technology standards and even specific interoperability requirements, and prefers to instead promulgate standards of *performance*.[242] As a recent publication of the Federal Trade Commission explains, "U.S. Government agencies, such as, for example, the Consumer Product Safety Commission, the Food and Drug Administration, and the Environmental Protection Agency, may set safety, health, and environmental requirements designed to protect the public, but they rely upon voluntary consensus standards, where possible, to meet their regulatory objectives."[243] In short, a gentle approach of encouraging standardization of health data could be more likely to succeed.

One such approach would be for the federal government to lead by example. Federal healthcare institutions could, for instance, adopt certain standards for storing patient treatment records. This approach has been

239. Peter Lee, *Toward a Distributive Commons in Patent Law*, 2009 WIS. L. REV. 917, 990 (2009).

240. *Id.*

241. Joseph Farrell & Paul Klemperer, *Coordination and Lock-in: Competition with Switching Costs and Network Effects*, *in* 3 HANDBOOK OF INDUS. ORG. 2007, 2010 (M. Armstrong & R. Porter eds., 2007).

242. *See* FED. TRADE COMM'N, COMPETITIVE ASPECTS OF COLLABORATIVE STANDARD SETTING, at 5 § 2.2(7) (June 9, 2010), https://www.ftc.gov/sites/default/files/attachments/us-submissions-oecd-and-other-international-competition-fora/usstandardsetting.pdf ("Most government standard setting activities . . . focus on performance standards, without reference to specific technologies or interoperability requirements.").

243. *See id.*

advocated by the Bipartisan Policy Center, a nonprofit policy think tank in Washington. In July 2015, the organization released a report recommending that Congress "require the federal government to adopt standards for health IT."[244] Measures outlined in the report include the federal government's adoption of standards designed to permit patients to be tracked over time and the adoption of common standards by private EHR vendors on contract with the government.[245] This idea could be an effective "nudge" to encourage standardization of private patient treatment records. If all EHR vendors that wish to work with the government must adopt standard ways of organizing patient treatment data, it might be easiest for these same vendors to store private hospital data in the same formats.

The government could offer incentives to institutions that conform to certain data standards. This recommendation was inspired by an expert interviewed for this study, who commented, "I think it may not be that we want the government to set the standards, because sometimes . . . they don't necessarily get it right . . . it may be that we want them to provide the incentives for the standards to be set."[246] One such incentive could be insurance reimbursements offered to health care providers. As explained earlier, the Patient Protection and Affordable Care Act offers monetary rewards to certain healthcare providers that demonstrate a record of high quality care. To reap these rewards, healthcare providers must share patient treatment data with outside institutions, including insurance providers. This law could be amended to offer an *enhanced* reward in the form of higher reimbursements to healthcare providers that share their data in specific, standard formats. In a related article, Rebecca Eisenberg and Nicholson Price explored how insurance companies, which hold claims data could play a role in developing important knowledge about the quality and efficacy of healthcare products—a concept they call "demand-side innovation."[247]

244. BIPARTISAN POLICY CTR., ADVANCING MEDICAL INNOVATION FOR A HEALTHIER AMERICA (July 2015), http://bipartisanpolicy.org/wp-content/uploads/2015/07/BPC-Advaning-Medical-Innovation.pdf.

245. *Id.* at 12 (describing such innovations in Proposal 1.7). A related effort is the Blue Button Initiative, led by the Department of Health and Human Services, which aims to enable patients to securely access personal health data online. *See What is the Blue Button?*, HEALTHIT.GOV (Jan. 15, 2013), https://www.healthit.gov/patients-families/faqs/what-blue-button. Although this program does not explore challenges posed by the lack of standards for data generated by consumer medical devices, the suggestions made here could nevertheless apply to data generated by such devices.

246. Telephone Interview with Richard L. Schilsky, M.D. (Aug. 26, 2014).

247. Rebecca Eisenberg & W. Nicholson Price, *Promoting Healthcare Innovation on the Demand Side* (Univ. of Michigan Law & Econ. Research Paper No. 16-008, 2016), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2766707.

Turning toward industry, this study revealed that data sharing between companies is frustrated by a variety of competitive concerns.[248] In this setting, it may be advisable for the government to take a more hands–on approach by directly mandating data sharing between companies. The FDA, for instance, could require drug manufacturers to make more clinical drug trial data (e.g., data describing safety or effectiveness of drugs) available to certain data-pooling efforts. Similarly, the FDA could require medical device manufacturers and software developers to adopt standards and data-sharing practices as a condition of having their products and services approved. This approach could be viewed as onerous, however. Pharmaceutical companies and manufacturers of devices that collect health data would likely oppose the idea because it places a new burden upon them. Some critics may argue, for instance, that a measure designed to promote innovation should not impose a new set of costs upon innovative companies.

A gentler approach would provide targeted rewards to companies that agree to pool data. There is precedent for this idea. Beginning in 2007, the FDA began offering "Priority Review Vouchers" ("PRV") to drug companies that sought FDA approval for products designed to target tropical diseases.[249] The vouchers, which substantially reduced the time necessary to bring a drug to market, were valued so highly by some corporations that they inspired the formation of at least one patent pool.[250] The FDA could offer a similar expedited review and approval process to companies that submit useful health data (e.g., clinical trial information, data generated by consumer health devices, etc.) to the public or to certain data-pooling consortia. Like PRVs, vouchers for this expedited review process could be transferrable, which would likely enhance their value.[251]

In a similar vein, the NIH and other federal agencies that provide research grants could impose stricter data-sharing requirements on grant recipients, and importantly, greater penalties for failure to adhere to such policies. The practice of "data-dumping," which one interview subject

248. *See generally supra* Part III.

249. *See* Michael Mattioli, *Communities of Innovation*, 106 NW. U. L. REV. 103, 126–27 (2015) (discussing the FDA's provision of such vouchers).

250. *Id.*

251. A similar possibility not directly inspired by this study would be for the United States Patent and Trademark Office (USPTO) to offer a similar fast-track to patent applicants who claim new innovations derived from data pools. This enticement could act as a general incentive. In 2009, the USPTO offered an expedited review process to patent applicants who claimed inventions that would benefit the environment. Pilot Program for Green Technologies Including Greenhouse Gas Reduction, 74 Fed. Reg. 64666 (Dec. 8, 2009).

reported is common, would likely be a helpful area for reform as well. Just as patent applicants are not permitted to hide potentially important information from the Patent and Trademark Office (PTO), federal grant recipients might be forbidden from obfuscating useful data from the public.

Yet another policy intervention could focus on reducing the risk of liability that data holders face for inadvertent disclosure of personally identifying information. The severity of civil and criminal penalties under HIPAA and related bodies of federal and state law designed to protect personal privacy could be reduced, for instance, for organizations that can demonstrate that they disclosed data to a data pool that has identified itself to relevant federal authorities.[252] Such a measure would entail creating a new procedure by which cooperative data pools could notify the FTC (or another federal agency selected) of their cooperative efforts. These measures could include standards to determine if contributed data has been sufficiently de–identified. In exchange, their potential liability for privacy violations under HIPAA and other relevant law could be capped at a percentage of what it would ordinarily be.

This remedy is directly inspired by the National Cooperative Research and Production Act (NCRPA)—a federal law passed in 1984 that reduces antitrust liability for certain research consortia that make their activities known to the Department of Justice and the Federal Trade Commission.[253] Because antitrust liability concerns did not appear to play an important role in discouraging data sharing among the institutions examined here, antitrust is not the subject of any specific recommendation. However, such an approach could be useful in other industry settings. Antitrust authorities have recognized that certain types of information-sharing arrangements between firms can have anticompetitive effects that violate the Sherman and Clayton Acts, however.[254] James Anton and Dennis Yao have posited that risks associated with antitrust liability "may interfere with transmission of information that could improve the joint decision to create a standard."[255]

252. Penalties under HIPAA include fines that can reach as high as $250,000 and up to 10 years in prison. 42 U.S.C. § 1320d(6) (2010).

253. *See supra* note 231.

254. Teece, *supra* note 61, at 474 ("[M]eetings and exchanges of technical information . . . can cause antitrust suspicion."); *see also* Tor & Aviram, *supra* note 101, at 236 ("Due to the potential anti-competitive effect of information sharing, antitrust law frequently analyzes the likelihood that information sharing will facilitate collusion."); HERBERT HOVENKAMP, FEDERAL ANTITRUST POLICY: THE LAW OF COMPETITION AND ITS PRACTICE 171–72 (1994) (discussing the types of information exchanges that may facilitate collusion).

255. Anton & Yao, *supra* note 231, at 264. For instance, an agreement among a group of companies to share pricing information in order to collusively charge consumers supracompetitive rates would be illegal. *Id.*

Tax incentives are another possibility. The IRS could enact a new rule offering charitable tax deductions to individuals who donate their health treatment data to certain qualifying data–pooling efforts, for instance. More nuanced measures could also be possible. Medicare reimbursements could, in the future, be enhanced for patients who agree to share their data more widely. Along the same lines, individuals who donate their data to certain pooling efforts could receive—from private insurers or through Medicaid—reimbursements for medical tests and procedures they would not otherwise be covered for.

Considering the variety of actors that hold data useful to oncology research and the variety of impediments that may discourage each actor from sharing its data, it is helpful to consider how the foregoing suggestions might pair with the various stakeholders discussed earlier in this Article. Table 1 summarizes these relationships visually by comparing various solutions that emerged during the interview process to the various stakeholders discussed earlier in this Article.[256] Cells of the table that contain an "X" indicate a solution primarily designed to address an impediment to data pooling that were consistently reported by a particular actor. This summary shows that (at least among the proposals suggested here), there is no "one–size–fits–all" solution.

256. I wish to credit and express my thanks to Pamela Samuelson for suggesting the use of a table to summarize these connections.

**Table 1: Primary Links Between Policy Suggestions and Stakeholders**

| | Healthcare Providers | Corporations (Drugs and Devices) | Academic Researchers | Patients |
|---|---|---|---|---|
| **Efforts to Standardize Patient Records** | X | | X | |
| **Insurance Reimbursements** | X | | | |
| **FDA–Mandated Data Sharing** | | X | X | |
| **Vouchers for Expedited FDA Review** | | X | X | |
| **Heightened Data–Sharing Requirements for Government Grant Recipients** | | | X | |
| **Reduced Penalties for HIPAA Violations** | X | X | X | |
| **Tax Incentives** | X | X | | X |

Each of the foregoing suggestions would present practical challenges, but some of these challenges may be surmountable. An overarching problem would be selective nondisclosure—i.e., the sharing of incorrect or incomplete data. This problem is, in a sense, a cousin of "data dumping," as described by the interview subject from academia. Any policy designed to mandate or encourage the sharing of data could be subject to this form of gaming. In light of this possibility, all such proposals would necessitate some level of monitoring and perhaps penalties for selective nondisclosure—two steps that would introduce complexity and cost. While these challenges should not be downplayed, they are curable. The FDA could levy sanctions, for example, on pharmaceutical corporations that attempt to circumvent a new set of data–sharing requirements. Academic researchers who engage in similar behavior could be denied future grants. In short, this problem is probably solvable.

Some of these measures could also spur litigation. Because data pools would likely need to be bound together by contracts, one would expect to see an increase in contract disputes as the number and size of data pools increase. One would also expect that data pools, if they form in large enough numbers, could raise competition concerns—through tying arrangements, or through pooling substitutive data, for instance. The number of civil disputes and prosecutions under antitrust laws could conceivably increase in the future.[257] This too would represent new costs.[258]

In the area of cancer treatment, it is easy to imagine that the costs of encouraging greater data pooling might well be dwarfed by the social and economic benefits of success. In other industries, the potential gains might be less clear. Through discussion and debate over proposals like those outlined here, policymakers, industry stakeholders, and the public can make informed decisions tailored to specific settings.

## V. CONCLUSION

The pooling of data appears to be an increasingly important and unmet precondition for innovation in many settings, and yet it may not occur without government intervention. To gain an empirical view of this problem, this Article presented an ethnographic study of institutions seeking to pool cancer treatment and research data. This study revealed that a variety of costs, risks, and competitive concerns are impeding the useful pooling of data. Some of these findings are not widely predicted by theory: hospitals do not wish to disclose data that reflects poorly on the quality of service they provide, and separately, they voice concerns over potential liability for privacy violations; pharmaceutical companies closely guard data that could reveal their business strategies to competitors; academic researchers have every incentive to hold tight to data that could fuel publications and professional advancement.

Informed by these insights and the important earlier work of other scholars that this study was based upon, this Article proposed a set of policy suggestions. First, lawmakers could encourage the adoption of health data-pooling by requiring federal healthcare institutions and the vendors they contract with to adhere to uniform standards for storing data; second, lawmakers could encourage even greater adoption of health data standards by offering targeted incentives similar to those offered to "Accountable

257. *See* D. Daniel Sokol & Roisin Comerford, *Does Antitrust Have a Role to Play in Regulating Big Data?*, *in* CAMBRIDGE HANDBOOK OF ANTITRUST, INTELLECTUAL PROPERTY & HIGH TECH 271 (Roger D. Blair & D. Daniel Sokol eds., 2017).

258. Even if data pools could avail themselves of the NCRPA, this would only result in reduced penalties.

Care" institutions under the Affordable Care Act; third, the FDA could offer a new expedited review process to pharmaceutical companies that cooperatively pool clinical trial data; fourth, lawmakers could modify HIPAA and other bodies of law designed to preserve patient privacy to encourage the responsible pooling of anonymous treatment data; fifth, income tax incentives could be offered to encourage individual patients to donate their health records to data pools. These suggestions are offered as tailored approaches designed to increase the volume and rate of patient treatment data pooling.

Researchers have glimpsed the future within data pools. It is written in the language of statistics—a language of patterns, signals, and unexpected correlations. Because this new science can spur innovation, the federal government has sought to encourage its development. Missing, however, is a plan for bringing highly dispersed data together, a necessary precondition. This Article has provided theoretical and empirical support for the view that data pools are unlikely to independently form and thrive. A single policy solution seems unlikely to address the many factors that discourage useful cooperation. Policymakers should now seek to understand the collective action problems that stand in the way. From this knowledge, they can assemble new constellations of policies designed to ensure that the cooperative preconditions for innovation are met.

# HOW OFTEN DO NON-PRACTICING ENTITIES WIN PATENT SUITS?

*John R. Allison,[†] Mark A. Lemley[††] & David L. Schwartz[†††]*

## ABSTRACT

Non–practicing entities (NPEs), some of which are also labeled patent assertion entities or "patent trolls," play a disputed role in our modern patent system. These entities, which do not make and sell products or services that embody their patented technologies, file a large percentage of all patent lawsuits. The perceived patent "troll" problem has dominated the discussion of patent reform in recent years. The policy debate is complicated by disagreement over who counts as a "patent troll," and by debates over whether NPEs are inherently problematic or whether the real problem consists of entities (practicing or not) that assert weak patents.

In this Article we present empirical results that provide insight into both questions. Drawing on a comprehensive data set we built of every patent lawsuit filed in 2008 and 2009 that resulted in a ruling on the merits, we find that the situation is rather more complicated than simply comparing operating companies to NPEs. While operating companies fare better in litigation than NPEs overall, breaking NPEs into different categories reveals more complexity. And once we remove certain pharmaceutical cases from the mix, no patent plaintiff fares very well. That is particularly true of software, computer, and electronics patents.

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## I. THE TROUBLE WITH "TROLLS"

NPEs, a subset of which are often referred to as patent trolls or "patent assertion entities" (PAEs), are the subject of much debate in the patent world.[1] Complaints that trolls are perverting the patent system or interfering with innovation are common. For instance, NPR and John Oliver's "Last Week Tonight" have both run feature stories on the problems with "trolls." There is anecdotal evidence that some PAEs assert low quality patents and seek nuisance–value settlements, and Congress is currently considering new legislation directed at the "patent troll" problem.[2]

1. Portions of this paragraph and the following one are adapted from Mark A. Lemley & A. Douglas Melamed, *Missing the Forest for the Trolls*, 113 COLUM. L. REV. 2117 (2013).

2. Innovation Act, H.R. 9, 114th Cong. (2015).

Although solid empirical work on NPEs is scarce, we do know that NPE suits represent a significant feature of the patent system. They account for a majority of all defendants sued for patent infringement.[3] The percentage of all patent lawsuits and accused infringers attributable to NPE–instituted litigation is even higher in the information technology (IT) industry.[4] Some studies find that they win both larger judgments and larger settlements than do operating companies.[5] However, other studies using the same data find the opposite.[6] There are complaints that NPEs often assert weak patents,[7] although empirical evaluation of patent quality metrics sometimes used by economists suggests that NPE patents are stronger than operating company

3. We use the term "assertions" to refer to the number of accused infringers (defendants in cases brought by patent owners).

4. Because NPEs tended to sue large numbers of defendants in single suits, at least until the passage of the AIA in 2011 made that much more difficult, it is important to focus on the number of assertions (that is, the number of defendants sued), rather than solely on the number of suits. A recent study co–authored by one of the authors of this Article found that operating companies were responsible for a minority of patent assertions in 2012. Christopher A. Cotropia, Jay P. Kesan, & David L. Schwartz, *Unpacking Patent Assertion Entities (PAEs)*, 99 MINN. L. REV. 649 (2014); *accord* Colleen V. Chien, *Patent Trolls by the Numbers* (Santa Clara Univ. Legal Studies Research Paper No. 08-13, 2013), http://papers.ssrn.com/abstract=2233041. *But see* Colleen V. Chien, *Of Trolls, Davids, Goliaths, and Kings: Narratives and Evidence in the Litigation of High-Tech Patents*, 87 N.C. L. REV. 1571 (2009); Robin Feldman, Tom Ewing & Sara Jeruss, *The AIA 500 Expanded: The Effects of Patent Monetization Entities*, 17 UCLA J.L. & TECH. 1, 7 (2013) (finding that "patent monetization entities," yet another term for PAEs, filed 58.7% of the patent lawsuits).

5. The 2016 PricewaterhouseCoopers study of patent litigation found that NPEs won damages awards three times as high on average as those won by practicing entities. Christopher Barry et al., *2016 Patent Litigation Study*, PRICEWATERHOUSECOOPERS 2 (2016), https://www.pwc.com/us/en/forensic-services/publications/assets/2016-pwc-patent-litigation-study.pdf. Because PWC's data sources and empirical methods are rather obscure, however, one must be cautious in using its patent litigation studies.

6. Michael J. Mazzeo, Jonathan H. Ashtor & Samantha Zyontz, *Do NPEs Matter? Non-Practicing Entities and Patent Litigation Outcomes*, 9 J. COMPETITION L. & ECON. 879 (2013) ("[F]ind[ing] no significant differences in the distribution of awards between NPEs and practicing entities"). The difference appears to be that Mazzeo et al. control for the nature of the defendants being sued, and NPEs target somewhat different defendants than operating companies.

7. *See* Robert P. Merges, *The Trouble with Trolls: Innovation, Rent-Seeking, and Patent Law Reform*, 24 BERKELEY TECH. L.J. 1583, 1603–04 (2009) (discussing allegations that trolls file suits on weaker patents). *But see* Shawn P. Miller, Patent "Trolls": Rent-Seeking Parasites or Innovation-Facilitating Middlemen? (Apr. 26, 2010) (unpublished manuscript), http://papers.ssrn.com/abstract=1885538 (finding that "trolls" generally litigate higher quality patents than practicing entities based upon patent citation counts).

patents.[8] There is also evidence that the most–litigated NPE–owned patents are more likely than other patents to lose in court.[9]

The evidence on the social costs and benefits of NPEs is highly contested. One study calculates that NPEs cost private firms[10] approximately $30 billion per year[11] and another study by the same primary authors estimated a total NPE cost of $500 billion over the past twenty years.[12] Both of these studies have been criticized, however, for using both flawed techniques and biased data sources.[13]

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8. *See* Michael Risch, *Patent Troll Myths*, 42 SETON HALL L. REV. 457, 478–81 (2012) (finding higher forward citations in the most litigious NPEs's patents); *accord* John R. Allison, Mark A. Lemley & Joshua Walker, *Extreme Value or Trolls on Top? The Characteristics of the Most-Litigated Patents*, 158 U. PA. L. REV. 1, 13–16 (2009) (finding higher forward citations and self–citations in the most litigated patents). Notably, however, the use of those metrics to assess patent quality has itself been questioned by some of the authors and others. *See, e.g.*, John R. Allison, Mark A. Lemley & David L. Schwartz, *Understanding the Realities of Modern Patent Litigation*, 92 TEX. L. REV. 1769 (2014).

9. *See* John R. Allison, Mark A. Lemley & Joshua Walker, *Patent Quality and Settlement Among Repeat Patent Litigants*, 99 GEO. L.J. 677, 694 (2011) (finding troll suits were much less likely to result in a patentee win than were operating company suits); Mazzeo et. al., *supra* note 6, at 890 (finding individual inventors had a lower success rate than "NPE-companies," which had a lower success rate than non–NPEs from 1995 to 2011); Shawn P. Miller, *Where's the Innovation: An Analysis of the Quantity and Qualities of Anticipated and Obvious Patents*, 18 VA. J.L. & TECH. 1, 29–31, 49–50 (2013) (finding that troll patents are more likely to be invalidated on prior art grounds). *But see* Shawn P. Miller, *What's the Connection Between Repeat Litigation and Patent Quality? A (Partial) Defense of the Most Litigated Patents*, 16 STAN. TECH. L. REV. 313, 334, 336 (2013) (using different measurements than those used by Allison et al., and finding troll–owned most–litigated patents are more successful than other patents); Michael Risch, *A Generation of Patent Litigation*, 52 SAN DIEGO L. REV. 67, 120 tbl.16 (2015) (finding that the more often a patent is asserted, the more likely it is to be invalidated, but that in the aggregate, patents asserted many times are less likely to be held invalid). Notably, the Allison et al. study focused on the most–litigated patents, and those patents (which are disproportionately owned by NPEs) likely have different characteristics than other patents.

10. Some of these studies purport to measure the "social" costs, but empirically only measure the costs to private firms. *See* Lisa L. Ouellette, *Patent Costs and Benefits*, WRITTEN DESCRIPTION (July 2, 2013), http://writtendescription.blogspot.com/2013/07/costs-benefits.html (discussing the distinction between social and private firm costs).

11. James Bessen & Michael J. Meurer, *The Direct Costs from NPE Disputes*, 99 CORNELL L. REV. 387 (2014).

12. James Bessen et al., *The Private and Social Costs of Patent Trolls* 17 (Boston Univ. Sch. of Law, Working Paper No. 11-45, 2011), http://ssrn.com/abstract=1930272.

13. For criticism of the study finding costs of $30 billion and its methodology, see David L. Schwartz & Jay P. Kesan, *Analyzing the Role of Non-Practicing Entities in the Patent System*, 99 CORNELL L. REV. 425 (2014). Schwartz & Kesan also criticized as "facially implausible" the other study, which used stock market movements to argue that each NPE lawsuit caused each defendant to drop in market capitalization between $122 million and $140.6 million at the mean. *Id.* at 447–48; *see also* Ron D. Katznelson,

There are those who defend NPEs on policy grounds. One common defense tends to be that PAEs—NPEs who purchase patents from others—can serve as business intermediaries between inventors and commercializers.[14] That claim too is controversial, as a matter of both theory and evidence.[15] There is some limited evidence that ex post patent demands do not generate much, if any, technology transfer or other direct innovation, whether delivered by NPEs or operating companies.[16] Some argue that ex post patent trade and licensing may nonetheless be socially valuable.[17] And, some argue that ex ante licensing (after patenting but

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Questionable Science Will Misguide Patent Policy—the $83 Billion per Year Fallacy (Jan. 27, 2017) (unpublished manuscript), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2502777 (arguing that there are "fundamental flaws" in the methodology used by Bessen & Meurer); Joff Wild, *There Are Now Very Serious Questions to be Asked of that Bessen & Meurer $29 Billion NPE Costs Claim*, IAM BLOG (June 7, 2015), http://www.iam-media.com/blog/detail.aspx?g=7c964cea-31fa-469a-99eb-8c5e2ee11818 (questioning why Bessen & Meurer's calculations are over 300% higher than calculations by RPX, the source of Bessen & Meurer's proprietary data).

14. Daniel F. Spulber, *How Patents Provide the Foundation of the Market for Inventions*, 11 J. COMPETITION L. & ECON. 271, 284 (2015); James F. McDonough III, *The Myth of the Patent Troll: An Alternative View of the Function of Patent Dealers in an Idea Economy*, 56 EMORY L.J. 189 (2006); Ashish Arora & Robert P. Merges, *Specialized Supply Firms, Property Rights and Firm Boundaries*, 13 INDUS. & CORP. CHANGE 451 (2004); Robert P. Merges, *A Transactional View of Property Rights*, 20 BERKELEY TECH. L.J. 1477 (2005). For discussion of this patent market idea, see, e.g., Stephanie Chuffart-Finsterwald, *Patent Markets: An Opportunity for Technology Diffusion and FRAND Licensing?*, 18 MARQ. INTELL. PROP. L. REV. 336 (2014); Damien Geradin, Anne Layne-Farrar & A. Jorge Padilla, *Elves or Trolls? The Role of Nonpracticing Patent Owners in the Innovation Economy*, 21 INDUS. & CORP. CHANGE 73, 87 (2011); Andrei Hagiu & David B. Yoffie, *The New Patent Intermediaries: Platforms, Defensive Aggregators, and Super-Aggregators*, 27 J. ECON. PERSP. 45 (2013); Ryan Holte, *Trolls or Great Inventors: Case Studies of Patent Assertion Entities*, 59 ST. LOUIS U. L.J. 1 (2014); Michael Risch, *Licensing Acquired Patents*, 21 GEO. MASON L. REV. 979 (2014). On the commercialization theory of patents, see Michael Abramowicz, *The Danger of Underdeveloped Patent Prospects*, 92 CORNELL L. REV. 1065 (2007); Michael Abramowicz & John F. Duffy, *Intellectual Property for Market Experimentation*, 83 N.Y.U. L. REV. 337 (2008); F. Scott Kieff, *Property Rights and Property Rules for Commercializing Inventions*, 85 MINN. L. REV. 697 (2001); Ted Sichelman, *Commercializing Patents*, 62 STAN. L. REV. 341, 345 (2010).

15. For critiques of the commercialization theory, see Mark A. Lemley, *The Myth of the Sole Inventor*, 110 MICH. L. REV. 709 (2012); Mark A. Lemley, *Ex Ante Versus Ex Post Justifications for Intellectual Property*, 71 U. CHI. L. REV. 129 (2004).

16. Robin C. Feldman & Mark A. Lemley, *Do Patent Licensing Demands Mean Innovation?*, 101 IOWA L. REV. 137 (2015) (finding in a survey of licensing managers that ex post patent licensing demands almost never lead to technology transfer from NPEs to targets).

17. Alberto Galasso, Mark Schankerman & Carolos J. Serrano, *Trading and Enforcing Patent Rights*, 44 RAND J. ECON. 275 (2013); Colleen V. Chien, *Software*

before commercialization) `will not operate efficiently without a credible threat of ex post or ex ante litigation.[18]

Part of the difficulty comes from a lack of clarity in defining whom exactly we are talking about. The pejorative term "troll" is used by some to refer to any party that doesn't actually produce goods or services. Indeed, some use "troll" to refer to anyone who is suing them, even practicing entities.[19] Others would exclude some entities—notably universities and individual inventors—from the troll definition. Still others would limit patent trolls further, to include only PAEs—companies whose primary line of business is filing patent suits. And even that definition is too broad for some, who would limit the term patent troll to those who assert patents they bought from others, only those who assert invalid patents, or only those who engage in certain "abusive" tactics in patent litigation, such as pressuring allegedly infringing manufacturers by threatening those manufacturers' end–user customers, or seeking nuisance–value settlements. The definitional question is sufficiently muddled that two of the authors designed a taxonomy of twelve different entity types, allowing people to decide for themselves who fits in the troll category.[20] The third author separately designed a taxonomy of eight different entity types, and released raw data from lawsuits filed in 2010 and 2012 to permit other researchers to study filing trends.[21]

Further complicating matters, NPEs can differ in their business models regardless of whether they are asserting good patents or bad ones, their own patents or acquired ones. Mark Lemley and Doug Melamed have distinguished three troll business models: (1) "bottom–feeder" trolls interested only in a nuisance–value settlement;[22] (2) "lottery ticket" trolls

*Patents as a Currency, Not Tax, On Innovation*, 31 BERKELEY TECH. L.J. (forthcoming 2017).

18. Risch, *supra* note 14.

19. Most people would agree that operating companies that compete in the field in which they sue are not trolls. Ted Sichelman calls them "patent bullies," at least when the underlying patents are weak. Ted Sichelman, *The Vonage Trilogy: A Case Study in 'Patent Bullying'*, 90 NOTRE DAME L. REV. 543 (2014). Colleen Chien calls them "goliaths." Chien, *supra* note 4, at 1577. For a discussion of the lack of consistency and transparency in the use of the term 'patent troll,' see Michael Risch, *Framing the Patent Troll Debate*, 24 EXPERT OPINION ON THERAPEUTIC PATS. 127 (2014).

20. Allison, Lemley & Walker, *supra* note 8.

21. Cotropia et al., *supra* note 4.

22. In an article on contingent fee representation in patent cases, David Schwartz describes a similar phenomenon in contingent fee lawyers in patent cases, referring to lawyers at the "bottom" of the market as those seeking nuisance–value settlements. David

interested in taking a case to trial for a big payoff;[23] and (3) "aggregators" who bundle numerous patents to license as a package.[24] David Schwartz has argued that another model likely exists, falling between Lemley & Melamed's "bottom feeder" PAEs and "lottery ticket" PAEs, and that PAEs in this additional category assert patents with some legal merit.[25] Moreover, the category we and others refer to as "operating companies" is likewise not monolithic. Operating companies sometimes spin off patents to separate entities in an effort to monetize their patent assets (or to harass their competitors)—a practice called patent "privateering."[26] And because PAEs predominate in some technologies and industries but are virtually absent in others, the success of PAEs suits is bound up with the differential success rates of patents in those different sectors.[27]

Finally, the asserted problems with patent trolls reflect more general problems with patent litigation, perhaps most notably the phenomenal cost of such litigation.[28] As Lemley and Melamed argue, understanding the economics of patent assertions by both trolls and practicing entities allows us to move beyond labels and the search for "bad actors,"[29] and to focus instead on aspects of the patent system that give rise to the problems, and

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L. Schwartz, *The Rise of Contingent Fee Representation in Patent Litigation*, 64 ALA. L. REV. 335, 344, 369–71 (2012).

23. David Schwartz refers to contingent fee lawyers seeking huge payments for a small number of alleged infringers as being at the "top" of the market. *Id.* at 362–64.

24. Lemley & Melamed, *supra* note 1, at 2119.

25. David L. Schwartz, *On Mass Patent Aggregators*, 114 COLUM. L. REV. SIDEBAR 51, 54 (2014).

26. *See id*. at 55; Tom Ewing & Robin Feldman, *The Giants Among Us*, 2012 STAN. TECH. L. REV. 1 (2012); John M. Golden, *Patent Privateers: Private Enforcement's Historical Survivors*, 26 HARV. J.L. & TECH. 545 (2013); Daniel Rubinfeld, *IP Privateering in the Markets for Desktop and Mobile Operating Systems*, 33 BERKELEY TECH. L.J. (forthcoming 2018).

27. We study technology and industry–specific differences in patent litigation win rates in our companion paper. *See* John R. Allison, Mark A. Lemley & David L. Schwartz, *Our Divided Patent System*, 82 U. CHI. L. REV. 1073 (2015).

28. In 2013, the average cost per party in relatively small patent infringement cases, with stakes of between $10 and $25 million, was $2.2 million through pretrial discovery and $3.6 million through trial. AM. INTELL. PROP. ASS'N, REPORT OF THE ECONOMIC SURVEY 31 (2013). The average cost of defending against a patent infringement case brought by an NPE (as defined by AIPLA) was a bit lower: $1.7 million through discovery and $2.7 million through trial. The latter fact is probably attributable in major part to the absence of patent infringement counterclaims in a case brought by an NPE because an NPE does not make or sell products or services that can form the basis of an infringement counterclaim by the defendant.

29. *See* Brian J. Love, *Bad Actors and the Evolution of Patent Law*, 101 VA. L. REV. ONLINE 1 (2015).

on specific, objectionable conduct in which both trolls and practicing entities sometimes engage. Patent trolls alone are not the problem; they are a symptom of larger problems with the patent system. Treating the symptom will not solve the problems. In a very real sense, critics have been missing the forest for the trolls.[30] The result is that the political and legal debate over PAEs has become bound up in definitional disputes and tied to larger debates over the value of the patent system as a whole[31] and its differential effects in different industries.[32] Our hope in this Article is to return some empirical grounding to those debates by providing evidence on an important issue (though by no means the only important one): how different types of patent plaintiffs actually fare in the small subset of cases which reach a merits ruling. While others have studied how the most litigious PAEs[33] or the most litigated patents[34] have fared, no one has previously analyzed the outcomes of all of the patents asserted in litigation. In this Article, we analyze merits rulings of all patent lawsuits filed during a two–year window, moving substantially beyond the work of previous researchers.

## II. METHODOLOGY

This Part explains in detail the techniques that we used to locate and collect the data.[35] We describe the data sources and provide information about the coders, our process of selecting data for inclusion in the data set, and the way we have organized cases into technology, industry, and entity status categories. We also discuss some of the limitations of our approach.[36]

### A. DATA COLLECTION

Thanks to electronic–filing requirements, the online–filing tool of the federal courts—Public Access to Court Electronic Records (PACER)—has a nearly complete collection of litigation documents from patent cases since

30. Lemley & Melamed, *supra* note 1, at 2117.

31. *See* Edward Lee, *Patent Trolls: Moral Panics, Motions in Limine, and Patent Reform*, 19 STAN. TECH. L. REV. 113 (2015).

32. On the different ways patents affect different industries, see DAN L. BURK & MARK A. LEMLEY, THE PATENT CRISIS AND HOW THE COURTS CAN SOLVE IT (2009).

33. Michael Risch, *The Layered Patent System*, 101 IOWA L. REV. 1535 (2015); Michael Risch, *Patent Troll Myths*, 42 SETON HALL L. REV. 457 (2012).

34. Allison, Lemley & Walker, *supra* note 8.

35. We plan to release the data set to the public after the publication of this Article.

36. Portions of this Part are adapted from our prior papers to the extent that this Article reflects the same methodology. *See generally* Allison, Lemley & Schwartz, *supra* note 8.

1999.[37] Some scholars have taken advantage of PACER data to analyze district court decisions in the early 2000s, when NPE litigation was not substantial.[38] Although the raw data provided by the Administrative Office of the United States Courts has coded case outcomes for more recent years, the data is notoriously error–prone,[39] and it does a poor job of classifying outcomes.[40]

Consequently, we used the Lex Machina database as our data source.[41] Lex Machina provides convenient access to cleaned and verified PACER data for district court patent litigation, which permitted us to carefully study all patent lawsuits. The Lex Machina data set offers three primary benefits. First, it includes all lawsuits—even those without a decision available on Westlaw or Lexis—and thus captures some district court decisions that the latter two sources may miss.[42] Second, Lex Machina has cleaned and evaluated the PACER data, eliminating many of the errors in the raw data.[43] Finally, Lex Machina has indexed the cases to identify summary judgment rulings, trial events, and appeals.[44]

Our study covers all patent lawsuits filed in federal district courts between January 1, 2008, and December 31, 2009. We selected the years

37. For a discussion of PACER coding and its shortcomings, see generally Matthew Sag, *Empirical Studies of Copyright Litigation: Nature of Suit Coding* (Loyola Univ. Chicago Sch. of Law, Pub. Law & Legal Theory Research Paper No 2013–017, 2013), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2330256. For information on PACER's completeness since 1999, see Alan P. Marco, Shawn C. Miller & Ted Sichelman, *Do Economic Downturns Dampen Patent Litigation?*, 12 J. EMPIRICAL L. STUD. 481, 488 n.39, 489 (2015).

38. *See, e.g.*, Jay P. Kesan & Gwendolyn G. Ball, *How Are Patent Cases Resolved? An Empirical Examination of the Adjudication and Settlement of Patent Disputes*, 84 WASH. U. L. REV. 237, 259–61 (2006) (examining the online docket reports available through the PACER system).

39. *See id.* (finding that a substantial percentage of cases were misclassified as patent cases); *see also* Kimberly A. Moore, *Judges, Juries, and Patent Cases—An Empirical Peek inside the Black Box*, 99 MICH. L. REV. 365, 381 (2000) (eliminating some cases, misclassified as patent trials, from the data set).

40. *See* Kesan & Ball, *supra* note 37, at 265 (explaining that the Administrative Office of the United States Courts' categories for case disposition are "rather ambiguous").

41. *See* LEX MACHINA (2015), www.lexmachina.com.

42. *See Features*, LEX MACHINA (2015), https://perma.cc/UNJ6-SE9W ("[V]iew all patent case outcomes for a specific judge or district, displayed in easy-to-read charts and graphs supported by interactive case lists.").

43. *See How It Works*, LEX MACHINA (2015), https://perma.cc/75XN-GP4E ("Lex Machina cleans, codes, and tags all data.").

44. *See id.* ("We identify all asserted patents, findings, and outcomes, including any damages awarded. We also build a detailed timeline linking all the briefs, motions, orders, opinions, and other filings for every case.").

2008 and 2009 for several reasons. First, those years are sufficiently recent to provide a snapshot of current patent litigation.[45] Second, because the cases were initiated several years ago, the overwhelming majority of those cases were definitively resolved or settled before our project began.[46] Lex Machina graciously provided us with a list of lawsuits from the years 2008 and 2009 that contained at least one ruling on summary judgment or trial. Lex Machina furnished a second list of lawsuits from the same years, including cases with an appeal but without a summary judgment ruling or trial. The second list allowed us to capture cases in which the parties stipulated to judgment based upon a claim–construction decision with the goal of placing the case in condition for appeal. Both lists provided by Lex Machina included basic information about each lawsuit, including the judicial district in which the case was filed, the identity of the district court judge, and the filing date of the lawsuit.

From the cases provided by Lex Machina, we excluded lawsuits that did not include a complaint either alleging infringement of a utility patent or seeking declaratory relief of noninfringement or invalidity of a utility patent. Thus, we excluded inventorship and licensing disputes, malpractice actions, false marking suits, and allegations of design or plant patent infringement. After removing these lawsuits, we reviewed the docket report closely, reading all relevant orders, opinions, motions, verdicts, appellate rulings, and other necessary court documents to code the litigation outcomes.

Because many of the dockets were extremely complicated—it was not uncommon for a patent case to have over 500 docket entries—we felt that student coders would be ill–suited for the task. Coding of outcomes, especially in patent cases, is notoriously difficult and time consuming, requiring deep knowledge of patent law and litigation as well as the motivation to devote long hours to the task. Consequently, two of the authors (Lemley and Schwartz) each personally coded the litigation–outcome information for approximately half of the lawsuits. Both Lemley and Schwartz are experienced patent litigators as well as academics who

45. We discuss various doctrinal and procedural changes since 2009 in Section I.D, *infra.*

46. We conducted the outcome coding in the late summer and fall of 2013. As of February 2014, it appeared that only 2 to 3 percent of cases from the years 2008 and 2009 were still open. *See* Dennis Crouch, *Pendency of Patent Infringement Litigation*, PATENTLY-O (Feb. 17, 2014), http://patentlyo.com/patent/2014/02/pendency-infringement-litigation.html; *see also* Kesan & Ball, *supra* note 38, at 245–46 (defending the decision to study cases by year filed rather than by year terminated).

understand how to read a docket and appreciate complex litigation rulings. The hand coding was extremely time intensive; it took several hundred hours in the aggregate. To permit an evaluation of the reliability and consistency of the coding, Lemley and Schwartz also overlapped in their coding of approximately 10% of the lawsuits.[47]

We use a patent–case combination as the unit of analysis. For each case, we coded the outcome separately for each asserted patent. For instance, if the jury returned a verdict on two patents, we recorded separately what occurred for each patent.[48] For each patent, we also obtained a variety of patent demographic information and various facts about the lawsuit in question. We reported those findings in our companion papers, and we

47. Lemley and Schwartz each initially coded approximately 5% of the cases. Thereafter, they compared results and fine–tuned the codebook. For coding of the remaining cases, Lemley and Schwartz overlapped in 10% of the initial list of cases provided by Lex Machina. Some of the cases provided by Lex Machina turned out not to have relevant merits decisions. After a manual review of the dockets, the 10% overlap resulted in thirty patent cases with duplicate coding. To increase the amount of overlap and permit the use of statistical tests to report intercoder reliability, Schwartz additionally coded another random 15% overlap with Lemley, for an additional 46 patent cases with duplicate coding. We chose Cohen's kappa ($\underline{\kappa}$) as the measure of intercoder reliability. *See* Mark A. Hall & Ronald F. Wright, *Systematic Content Analysis of Judicial Opinions*, 96 CAL. L. REV. 63, 113–14 (2008) (stating that the best practice for evaluating coding reliability is to report an agreement coefficient, such as $\underline{\kappa}$). $\underline{\kappa}$ ranges from 0 to 1, with numbers near 1 indicating a higher degree of reliability. *See id.* (explaining that a 0 indicates "agreement entirely by chance" and that a 1 indicates "perfect agreement"). For the basic definitive and interim winners in cases, $\underline{\kappa}$ was 0.9534, equating to near–perfect agreement. For grants of motions for summary judgment on invalidity and noninfringement, $\underline{\kappa}$ was 0.9793, which also equates to near–perfect agreement for times in which we both identified motions. However, one of us found one additional motion for summary judgment of invalidity (40 versus 30). For motions for summary judgment on noninfringement, we each identified motions that the other did not (42 motions were found by both authors; one found 43 motions, while the other identified 44 motions). We revisited the overlapping case dockets again to understand these additional rulings, and we found that the additionally identified rulings should be included. We corrected all known disagreements in the data set. We believe that these differences in coding are due to the complexity of the dockets, and we do not believe that they are biased in one direction or another. We do believe, however, that the reliability information suggests that we slightly undercounted the number of merits rulings, although we cannot be sure whether the actual number should have more denials or grants.

48. Occasionally, the court ruled differently on different claims of a patent. For instance, a first claim may be infringed and not invalid, while a second claim was not infringed and invalid because it was "anticipated" by a prior patent or printed publication revealing the same invention. In these cases, we created a new record for each claim or group of claims that had a different substantive outcome, thus taking the unit of observation down from the level of the patent to the level of the individual claim or group of claims.

detail the information we collected there.[49] We coded each civil action separately.[50] If multiple civil actions involved the same patent, we coded them as separate observations, even if the lawsuits were consolidated. The descriptive statistics that we report below include each patent in each civil action, even those in consolidated lawsuits. However, our regression models take into account consolidated lawsuits, since we cluster standard errors at both the patent and case level.

For each patent in a lawsuit, the coders reviewed and captured all rulings on summary judgment relating to a patent–law issue. This includes rulings on motions of summary judgment on noninfringement, infringement, validity, invalidity, no inequitable conduct, and inequitable conduct. We excluded rulings on issues that were not patent specific, such as laches. We also excluded summary judgment rulings on patent–law issues if the court did not reach the merits of those issues, such as denials of summary judgment motions on the grounds that they were premature. We also reviewed and recorded all trial outcomes, whether there was a jury or a bench trial, as well as decisions on post–verdict motions for judgment as a matter of law. Finally, we recorded whether an appeal was lodged and how the appeal was resolved. The resolution data set includes whether the ruling on the patent was affirmed or reversed on appeal, or whether an appeal is pending or was dismissed (typically because the case settled). When the underlying trial or appellate court opinion lacked sufficient detail to ascertain the basis for the ruling, we read the underlying briefing by the parties.

We coded merits decisions at a low level of granularity. For invalidity, we coded whether the ruling was based on utility, patentable subject matter, § 102 prior art,[51] obviousness, indefiniteness, written description, enablement, or best mode. We also coded various bases for § 102 invalidity. For infringement, we captured literal infringement, infringement under the doctrine of equivalents, and various types of indirect infringement. We also coded unenforceability, as well as the basis for the unenforceability argument. In addition to the separate coding of issues for summary judgment and trial, we also recorded the final resolution for each patent on the issues of infringement, validity, and enforceability.

49. *See* Allison, Lemley & Schwartz, *supra* note 8, at 1779–80.

50. We treated a patent in a lawsuit as a single observation even if the patent was asserted against multiple parties in the same suit.

51. *See* 35 U.S.C. § 102 (2012).

We coded all the issues litigated to decision, whether or not that decision resulted in a trial outcome or a grant of summary judgment. Thus, if an accused infringer argued that the patent was invalid for lack of patentable subject matter, anticipation, and obviousness, and the court denied the first two arguments but granted the third, each of those three rulings shows up in our data set.[52] To understand how the final–resolution variables were coded, one should understand that denial of summary judgment does not result in a final resolution. Instead, denial of summary judgment means that there is an unresolved disputed issue of material fact.[53] Consequently, while we recorded all denials of summary judgment, they alone do not result in a final ruling in either direction. If, however, the issue had been resolved at trial, then the final ruling was coded as the trial resolution. If summary judgment had been granted on an issue, then the summary judgment ruling was coded as the final resolution in our coding.[54] We coded decisions that definitively ruled for a party on an issue as definitive wins, and decisions that ruled for a party but kept the issue alive (largely denials of summary judgment but also remands on appeal) as interim wins.[55]

### B. TECHNOLOGY AND INDUSTRY CLASSIFICATIONS

In our second companion paper, we focused on comparing outcomes across the technology and industry categories of the asserted patents.[56] Our technology categories refer to the nature of the invention itself, while our industry categories focus on the owner of the patents and the industry in which the technology is put to use.

52. To be clear, while we included merits rulings on each issue, we did *not* include the issue if the court denied the motion as moot. For instance, if the court granted summary judgment of anticipation on the merits and simultaneously denied summary judgment of obviousness as moot, we included anticipation but not obviousness.

53. *See* FED. R. CIV. P. 56.

54. If the Federal Circuit reversed a ruling relating to a patent on appeal, we updated the final–resolution coding to reflect the appellate decision. If the ruling was reversed on appeal, we retained the original decision in our summary judgment coding (though not our final–resolution coding) because we wanted to capture summary judgment win rates at the trial court. We don't believe that this coding decision meaningfully affects our results. Many grants of summary judgment weren't subject to an appeal and most appeals resulted in at least partial affirmance. Even some reversals were retried to the same result. Only a small percentage (less than 10%) of patents ruled invalid or not infringed on summary judgment were subject to a complete reversal followed by settlement in our data set.

55. On infringement, we counted a decision as a "win" when the patent owner prevailed on at least one asserted claim.

56. Allison et al., *supra* note 27.

Although the U.S. Patent and Trademark Office (PTO) has a technology classification scheme, we don't use it. It was not created for the purpose of defining technologies at a conceptual level, it employs definitions at a very low level of functional abstraction, and it possesses other serious shortcomings.[57] We wanted a series of broad categories that would capture inventions of different types. To achieve this goal, one of us (Allison) evaluated all of the patents in our study by hand and categorized them into one of six different technology areas and one of eleven different industry categories. We discuss the definitions of each of those categories in detail in our companion paper.[58] We include in this Article breakdowns by both technology and industry category.

### C. ENTITY STATUS

The heart of this Article is our discussion of patent litigation outcomes by entity status. As we noted above, there are many different business models among patent plaintiffs and considerable debate over what entities are properly classified as patent trolls. Two of the authors, Allison and Lemley (along with Walker), have previously categorized patent owners into twelve different types.[59] The third author, Schwartz, has previously categorized patent owners into eight different types.[60] The Stanford Patent Entity Status Project is currently in the process of classifying all patent plaintiffs since 2000 into one of thirteen different categories, building on and expanding the Allison–Lemley–Walker taxonomy.

We hand–coded entity status results. Sometimes, the coding was obvious, as was true in the case of suits by individuals, universities, and some of the larger operating companies. Where the coding was not evident, one of us (Schwartz) reviewed the complaints in the cases and the website of the plaintiff firm to identify the predominant nature of the plaintiff's business model. We cross–checked that coding against the coding currently being done by the Stanford Patent Entity Status Project, which includes all of our cases, to identify and further investigate any discrepancies in coding. There were disagreements in less than 10% of the parties. Some of the disagreements occurred because there was little available information about

57. *See* John R. Allison, Mark A. Lemley, Kimberly A. Moore & Derek Trunkey, *Valuable Patents*, 92 GEO. L.J. 435, 438 n.15 (2004) (discussing these shortcomings). When a researcher works with an extremely large data set such that it is not feasible to study each patent in depth as was done here, reliance on PTO classifications or International Patent Classifications may be an unavoidable shortcut.

58. Allison et al., *supra* note 27, at 1084–89.

59. Allison et al., *supra* note 20, at 10.

60. Cotropia et al., *supra* note 4, at 654–56.

some patent plaintiffs, partially because of the time lag between the lawsuits and the present study. The lawsuits were brought six to seven years ago. The disagreements were resolved and corrected in the coding. Eventually, we coded every entity asserting a patent in our dataset.

In classifying the cases in our data set, however, we found that many of these categories had few, if any, cases in the years we studied. Further, classifying an entity as, for example, a startup spun off from a university that had never made a product, or a pre–product startup that had not yet made a product but still planned to do so, turned out to be quite difficult. And, given that there were relatively few cases in each category, we opted for a smaller number of broader, more functional entity categories.

Accordingly, we collapsed some categories and divided patent plaintiffs into one of five exclusive groups (which are a subset of both the previous Allison–Lemley–Walker methodology and the Cotropia–Kesan–Schwartz methodology): operating company, university, individual, failed startup/failed operating company, and patent holding company (including aggregators). With effort, we were able to classify all of our patent holders into one of these categories. We refer to patent holding companies as our narrow definition of PAE—companies in the business of acquiring and asserting patents. We classified a patent holder as a university if a university was the sole plaintiff. If there was a co–plaintiff that was an operating company—such as a pharmaceutical company—we assumed that the operating company controlled the litigation and classified the lawsuit as one maintained by an operating company patent holder. Spinoffs from universities were not treated as university patent holders. They were treated as an operating company or a failed company, depending upon whether they manufactured products at the time of the lawsuit.

We treated a patent holder as a failed startup or company if there was evidence that the company manufactured products or performed services, or attempted to do the same at some point in the past, but no longer did. We attempted to measure this as of the time of filing the lawsuits—either 2008 or 2009. We classified a company that was owned entirely by an individual inventor as an individual inventor. For instance, according to judicial opinions, Ergo Licensing LLC is a licensing company owned solely by one of the original inventors of the patent.[61] Ergo appears to have been created to license the patent, not to attempt to commercialize it. In our coding, we distinguished lawsuits by inventor–owned companies from lawsuits

61. *See* Ergo Licensing LLC v. Cardinal Health, Inc., No. 08-259-P-5, 2009 WL 2021926 (D. Me. July 13, 2009).

initiated by an individual inventor in his or her personal capacity. However, in both instances the inventor, whether litigating as a personal owner of the patent or as an owner of a shell corporation that owns the patent, presumably received substantially all of the net proceeds of the litigation and likely directed the litigation strategy. For purposes of analysis in this Article, we collapsed the categories of individual-litigating-in-an-individual-capacity and individual-litigating-in-corporate-form into a single category called "Individual." We also ran a separate analysis for each of our results in which we compared operating companies with everyone else—we call the latter category simply "NPE."

Our choice of categories necessarily leaves out some information we might wish to know. We found no way, for instance, to reliably categorize operating companies based on whether the patent they were asserting was one they actually practiced, one that they employed to keep competitors out of a given space but did not use as the basis for making a product or service, or one that was in a field in which they did not operate at all (in which case it is effectively an NPE with respect to that patent). Similarly, the distinction between individual–owned patents and failed startup patents can sometimes (but not always) be difficult to ascertain, as it was hard to determine whether a company made efforts to commercialize or was formed merely to attempt to limit liability before initiating litigation. It was difficult for us to ascertain whether a company was a failed startup or just a company formed by the individual inventor. Nonetheless, we think the divisions we used capture significant differences in business models, and allow for a more nuanced analysis than would be achieved by merely distinguishing operating companies from NPEs.

Our analysis of the data is cumulative of that of the other two papers. In our first paper, we evaluated the characteristics of individual patents to see how they correlated with litigation outcomes.[62] In our second paper, we added industry and technology characteristics to the existing set of patent variables to help explain variance in patent litigation outcomes.[63] In this Article, we retain those explanatory variables and add our new variables for entity status.[64] Thus, the logistic regressions we report in the next Part

62. Allison, Lemley & Schwartz, *supra* note 8.

63. Allison et al., *supra* note 27.

64. We use logistic regression (or logit) models, because each of our dependent variables (specific outcomes) is binary ("yes" or "no"). Although multivariate regression assumes that all observations are independent of one another, this assumption does not hold when applied to studies of patent infringement litigation. There are several reasons for this: (1) many cases involve the assertion of multiple patents, decisions about these patents are

include not only entity status but also most of the other independent variables from the last two papers as explanatory factors.[65]

### D. POTENTIAL LIMITATIONS

Our data set and the implications that can be drawn therefrom are subject to several limitations. For brevity, we discuss three important limitations here.

First, our data set is limited to lawsuits filed in the years 2008 and 2009. Thus, it is only a snapshot of the larger flow of litigation. The 2008 and 2009 lawsuits may or may not be generalizable across a longer time period. The exact beginning and ending points of our data set—January 1, 2008, and December 31, 2009—are artificial cutoffs. Obviously, which suits were brought just inside and outside the time period may be due, in part, to chance. These cases are sufficiently recent, in our opinion, that the results are generally applicable today. However, there have been several legal changes in the interim that may make lawsuits today different from those in our data set. The most salient changes are the passage of the Leahy-Smith America Invents Act[66] in 2011 (including the introduction of Inter Partes Review), the Federal Circuit's *Therasense* decision[67] in 2011, a series of

made by the same judge and jury, and sometimes two or more of the patents asserted in the same case originated with the same original patent application; (2) it is common to find in a data set that the same patent has been litigated in multiple separate lawsuits against different defendants, and even though the decision makers may be different, the same patent has the same attributes in each case; and (3) some cases will be consolidated, with the same decision maker deciding certain issues—usually only pretrial summary judgments, but sometimes trial decisions as well. *See* Allison et al., *supra* note 9, at 678–79; John R. Allison & Mark A. Lemley, *Empirical Evidence on the Validity of Litigated Patents*, 26 AIPLA Q.J. 185, 245 (1998); Kesan & Ball, *supra* note 38, at 261. To remedy the lack of complete independence among observations, we simultaneously clustered on the standard errors of both the unique patent numbers and the cases, because both the patents and the lawsuits were sources of observational correlation.

65. We did not have enough degrees of freedom, determined by the number of observations and the number of variables, to include all thirteen of the most–used federal districts as independent variables in our logistic regression models as we had done previously, instead including only the top three districts in the regressions. We do, however, report all thirteen of the most–used districts in the descriptive statistics.

66. Pub. L. No. 112-29, 125 Stat. 284 (2011) (codified in various sections of Title 35).

67. Therasense, Inc. v. Becton, Dickinson & Co., 649 F.3d 1276, 1296 (Fed. Cir. 2011) (en banc) (holding that the appropriate standard for intent to deceive is the "knowing and deliberate" standard).

Federal Circuit decisions on venue beginning in December 2008,[68] and four Supreme Court cases involving the doctrine of patentable subject matter decided in 2010,[69] 2012,[70] 2013,[71] and 2014.[72] The Federal Circuit also issued several opinions involving patent damages, which may have affected litigant behavior and settlement during the period of our study.[73] These opinions may influence what issues litigants press and, separately, which cases reach the stage of a ruling on the merits. So too may Supreme Court decisions that change the availability of attorney's fees to prevailing defendants.[74] Accordingly, the cases filed today may differ from those that we studied. And some of the cases in our data set were decided under Supreme Court and Federal Circuit opinions issued after the respective cases were filed. These subsequent legal changes may have been unforeseeable to the patent owners when they originally elected to initiate lawsuits, when the PTO originally examined the underlying patent applications, and when the patent attorneys drafted the applications.[75]

Second and perhaps more important, our data set contains only patents that were subject to an interim or definitive merits ruling on summary judgment, a trial, or an appeal. To be sure, we have the entire population of cases that resulted in a ruling on a dispositive motion or trial. For these

68. *See generally* Paul R. Gugliuzza, *The New Federal Circuit Mandamus*, 45 IND. L. REV. 343 (2012) (discussing the Federal Circuit's shift in favor of granting writs of mandamus to order district courts to transfer cases to other venues).

69. Bilski v. Kappos, 561 U.S. 593, 612–13 (2010) (holding that the machine–or–transformation test is not the exclusive test for patentable material).

70. Mayo Collaborative Servs. v. Prometheus Labs., Inc., 132 S. Ct. 1289, 1302, 1305 (2012) (setting out a two–part test for determining when a claim that includes a natural phenomenon or fact about the world is patentable).

71. Ass'n for Molecular Pathology v. Myriad Genetics, Inc., 133 S. Ct. 2107, 2118–19 (2013) (holding that isolated DNA is not patent eligible because it involves a naturally occurring segment of DNA, but that synthetically created DNA is not naturally occurring and can therefore be patented).

72. Alice Corp. v. CLS Bank Int'l, 134 S. Ct. 2347 (2014) (applying the two–part *Mayo* test to abstract ideas in the software and business method spheres).

73. *See, e.g.*, Uniloc USA, Inc. v. Microsoft Corp., 632 F.3d 1292, 1315 (Fed. Cir. 2011) (prohibiting the use of the 25% rule of thumb for calculating reasonable royalties); ResQNet.com, Inc. v. Lansa, Inc., 594 F.3d 860, 873 (Fed. Cir. 2010) (vacating the district court's damages award because the reasonable royalty determination relied on speculative evidence).

74. *See, e.g.*, Octane Fitness, LLC v. Icon Health & Fitness, Inc., 134 S. Ct. 1749, 1755–56 (2014).

75. *See* David L. Schwartz, *Retroactivity at the Federal Circuit*, 89 IND. L.J. 1547, 1550 (2014) (arguing that many Federal Circuit opinions have a weak prospective effect on future patents but a strong retroactive effect on existing patents).

cases, we report statistical results on the outcomes. However, most lawsuits settle, and as our data confirm, most lawsuits settle before any ruling on the merits.[76] Cases that settled before any substantive patent ruling are completely absent from our data set. Moreover, many patent disputes don't result in litigation.[77] Our data set lacks unlitigated disputes about patents. The upshot is that we cannot confidently generalize our data and results to the cases or disputes that settled without any substantive ruling.[78] Thus, while our data shed light on who wins and who loses patent cases and dispositive motions, the data cannot tell us who *would* win cases that are filed but settled without a judgment.[79]

We do not even have a sense of which direction the bias, if any, would point if one were interested in all litigated cases. Moreover, we do not know whether settled cases involving NPEs are stronger or weaker than other settled cases. For any case, whether strong or weak, settlements occur when the parties' views of the underlying merits and relative risks and costs of litigation come together. On the one hand, it may be that the cases that are settled before a merits ruling are mainly cases where both parties expected the patentee to win. If this were true, then the defendant win rates we observe in our data set would be higher than would be true if all cases were litigated to judgment. On the other hand, it could be that the cases that settled before a merits ruling consist disproportionately of meritless cases that were resolved via cost–of–defense settlements.[80] If this alternative

76. *See* Kesan & Ball, *supra* note 38, at 271–73 (finding that the vast majority of patent cases settle); Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495, 1501 (2001) ("The overwhelming majority of [patent] lawsuits settle or are abandoned before trial.").

77. *See* Lemley, *supra* note 76, at 1507 (estimating that only 1.5% of patents are litigated, while perhaps another 5% are licensed without litigation).

78. By comparing a random sample of patent cases that were filed in 2008–2009 but *not adjudicated* with the adjudicated ones in our data set, however, we do show that there is substantial, albeit imperfect, consistency across technology and industry categories between cases that were filed and settled and cases that were filed and taken to a merits decision. *See infra* Tables 10–12 and accompanying text.

79. Litigation and settlement incentives are extremely hard to quantify or observe. The incentives are likely influenced by many factors, including the venue of the litigation. *See* Allison, Lemley & Schwartz, *supra* note 8, at 1793 (reporting diversity in case outcomes in patent litigation in eight distinctly busy patent districts). In our previous work, we have provided a comparison between filed lawsuits by district and our data set of adjudicated patents. *Id.* at 1778–81.

80. Such claims may be common. *See* Lemley & Melamed, *supra* note 1, at 2163 (stating that patent trolls pursue a large number of cases, many of which a practicing entity would probably not bring, but that these cases are more likely to settle quickly). Moreover, prior research has shown that patent owners who assert their patents many times lose more

hypothesis were true, then our estimates of defendant win rates from the cases that reached the merits phase would be lower than the defendant win rate if all filed cases went to judgment. We do not know how, if at all, the prevalence of the foregoing types of settlements differ between NPE and non–NPE cases. Because almost all settlements are confidential,[81] we cannot assess the direction of the bias of our observations relative to the population of litigated cases. We set forth in detail various selection theories and their potential effects on our results in Section IV.A.

Third, the size of our data set is relatively modest, with fewer than 1,000 patent observations.[82] This is not a sample; we report the full population of merits decisions for lawsuits filed in the years 2008 and 2009.[83] However, once the data set is further broken down by technology, and further still by patent law issue and procedural stage, the number of observations in each category becomes much smaller, making statistical significance harder to find.[84] We urge readers to interpret our results with these three limitations in mind.

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often than owners who assert patents less frequently. *See* Allison, Lemley & Walker, *supra* note 9, at 712. We also note that we do not know the true 'value' of the patents involved in litigation. One person's 'nuisance' settlement may be, in fact, a fair settlement for the value of the patent. Schwartz, *supra* note 22, at 371. That said, in a large number of NPE cases settlements take the form of round numbers unrelated to the size of the defendant's business, which seems hard to square with value–based settlements. *See, e.g.*, SFA Sys., Inc. v. Newegg, 793 F.3d 1394 (Fed. Cir. 2015); *Eon–Net LP v. Flagstar Bancorp*, 653 F.3d 1314, 1324 (Fed. Cir. 2011). Disclosure: Lemley represented Newegg in the latter case.

81. *See* Scott A. Moss, *Illuminating Secrecy: A New Economic Analysis of Confidential Settlements*, 105 MICH. L. REV. 867, 869 (2007) ("*Public* settlements are the exception, common in only a few types of cases.").

82. This is an unavoidable consequence of the extreme labor–intensiveness of the highly granular coding we did for every patent and every outcome.

83. Because our data set is a population, we are not merely inferring things about a population from a sample. By definition, any difference observed in a population is statistically significant. However, we generate inferential statistics in our regressions as though we were inferring things from a sample about the population from which the sample was drawn. We do this because readers may wish to extrapolate from our findings to a period of time outside the date parameters of our population, in which case our population is a sample of something larger.

84. The calculation of statistical significance does, of course, take into account the number of observations involved in a particular statistical test; the lower the number of observations, the greater the magnitude of difference there must be for a finding of statistical significance. It is important to consider the absolute and relative (to other coefficients) magnitudes of the coefficients when there is no statistical significance. The other side of this statistical coin is that it is easier to find statistical significance as the numbers of observations increase; thus, when one finds statistical significance for an

## III. RESULTS

### A. DESCRIPTIVE STATISTICS

We begin by reporting the descriptive characteristics of our data set. For this Article, we focus on entity status: the reader can find much more detail about the characteristics of the litigated patents and the industries and technologies represented in our prior work.[85]

#### *1. Overall Decisions*

NPEs of all types represented slightly more than a quarter of all cases in our data set (264 out of 945 decisions); the balance of cases were brought by operating companies. The results are reported in Table 1a. This percentage may seem surprisingly low given press reports that NPEs are currently responsible for a majority of all patent assertions. Three factors help explain this discrepancy. First, our dataset is comprised of lawsuits filed six or seven years ago, when NPEs apparently brought fewer assertions than they do today. According to a study of lawsuit filings by other researchers, NPEs made up less than half of both lawsuit filings and accused infringers in 2008.[86] As a check, we drew a random sample of 2008 and 2009 filings. It also supports the view that operating companies brought a majority of the lawsuits in that time period. Second, our unit of measurement here is patent–case pairs, not the number of defendants sued. So, a case filed by a patent plaintiff against forty defendants that results in a finding of invalidity shows up in our data set as one result, not forty. Our study ended with lawsuits filed in 2009, several years before the joinder rules were changed to require suits against separate defendants to be filed separately unless the defendants are affiliated or the assertions against them are based on the same transaction or series of transactions.[87] Because NPEs before 2011 tended to sue more defendants in a single lawsuit than did operating companies, it is not surprising that they represent well less than half of all *decisions.* Third, there is reason to think that NPEs are more likely

independent variable that has a relatively large number of observations, it is a good idea to also look closely at the absolute and relative magnitude of the coefficient in question to determine whether the finding of statistical significance means that there is any real practical significance—that is, does the observed difference in coefficients really matter in a practical way. Thus, the coefficients provide important information, whether or not there is a finding of statistical significance.

85. *See* Allison, Lemley & Schwartz, *supra* note 8; Allison et al., *supra* note 27.

86. Feldman et al., *supra* note 4, at 42–44 (reporting that in lawsuits filed in 2008, operating companies sued 56.8% of all patent defendants).

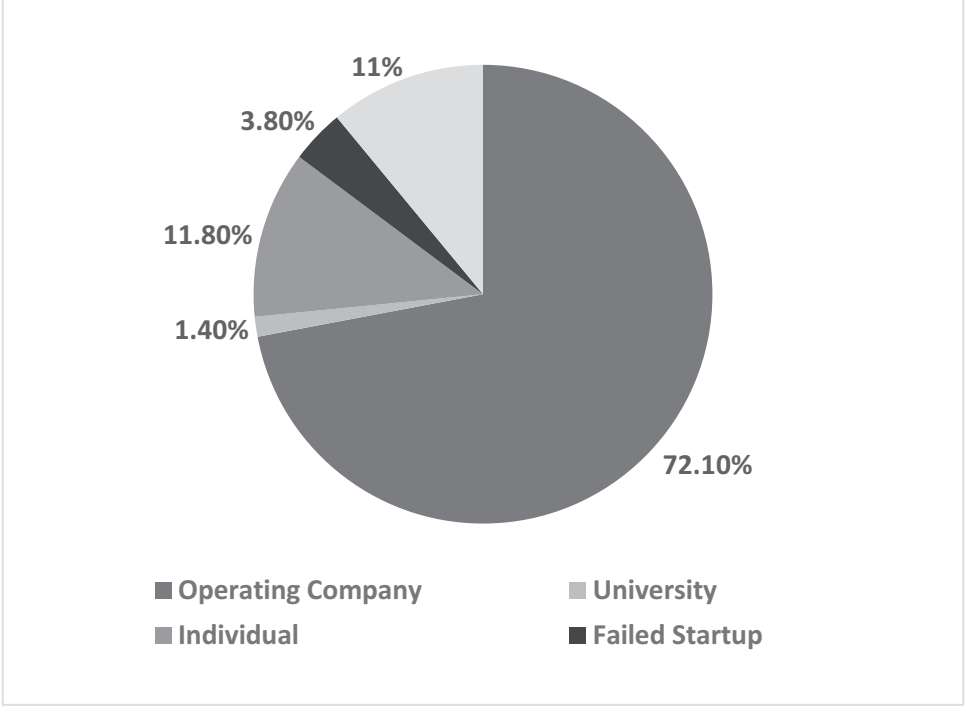
87. 35 U.S.C. § 299 (2012).

to settle their cases before decision,[88] although the random sample of filed–but–unadjudicated cases undercuts this reason. Settled cases do not appear in our data set.

**Table 1a: Entire Population—Operating Companies vs. NPE**

| | Frequency | Percent |
|---|---|---|
| **Operating Co.** | 681 | 72.1% |
| **NPE** | 264 | 27.9% |
| **Total** | 945 | 100.0% |

**Figure 1: Population—Operating Companies vs. NPE**




88. *See* Lemley & Melamed, *supra* note 1, at 2126 (noting that some patent troll business models depend on settlement). Allison et al. found that NPEs settled at a somewhat higher rate than did operating companies (90% vs. 85%), but the difference was not statistically significant in their smaller study. Allison et al., *supra* note 31, at 689–709; *see also* Christopher A. Cotropia, Jay P. Kesan, & David L. Schwartz, *Heterogeneity Among Patent Owners in Litigation: An Empirical Analysis of Settlement, Case Progression, and Adjudication* (Working Grp. on Intellectual Prop., Innovation & Prosperity, Working Paper No. 16008, 2016) (finding some differences in settlement rates among various types of entities).

In Figure 1, we break down the NPEs into their component groups.[89] Individuals and PAEs make up the bulk of all NPE cases in our data set, together accounting for 215 of the 264 NPEs, or 81.4%. The remainder consists of mostly failed startups; universities accounted for only thirteen cases in our data set.

*2. Forum Selection*

We find major differences between operating companies and NPEs in the federal districts in which the lawsuits were filed and decided. We identify each of the thirteen judicial districts with the most patent cases. The differences for the top four districts are reported in Table 2a, which lists the number and percentage of decisions for operating companies and NPEs in each district. Table 2b does the same thing, but with NPEs separated into their subtypes. The differences for the full thirteen districts are reported in the Appendix. The tables comparing operating companies with a broad NPE category also indicate in the far right–hand column a p–value showing whether the observed differences in percentages (proportions) by district, when sorted by entity type, are statistically significant when compared with the difference in percentages among districts overall.[90] For tables with NPEs separated into their subtypes, we compared each subtype to an operating company category, and noted statistically significant results in the table itself by the use of asterisks.[91]

89. Table A1 in the Appendix provides the raw counts of each group.

90. This was done by conducting an "equality of proportions" test, in which the null hypothesis is that the proportions attributable to each entity type are equal. If at least one of the proportions is not equal to the others at a confidence level of 95% or more—a p–value of $< 0.05$—we can say that the finding of inequality is not due to chance with that level of confidence. In subsequent tables showing descriptive statistics, the Fisher's Exact tests (used when numbers of observations are small) for equality of proportions will be used the same way: are the observed differences in percentages among districts, technologies, or industries, *when sorted by entity type*, statistically significant when compared with the proportions among districts, technologies, or industries *overall*, that is, *without sorting by entity type*.

91. In each regression, we employ a null hypothesis of "no difference." If we are able to reject the null hypothesis, this means that we can, with a particular degree of confidence, assert that the observed difference is not due to chance. Thus, in this Article, we use the following scheme for denoting p–values: * = $p < 0.05$; ** = $p < 0.01$; *** = $p < 0.0001$. We include a + symbol if $p < 0.10$. A p–value of less than 0.05 means that one can say with over 95% confidence that the difference we observe is not due to random chance. A p–value of $< 0.01$ means that we can do this with at least 99% confidence, and $p < 0.001$ means a confidence level of over 99.9%. Stated differently, a p–value of $< 0.05$ means that there is less than a 5% probability that the observed difference is the product of random chance, and so on for other p–values.

The Eastern District of Texas decided a disproportionate number of NPE cases. From other sources, we know that a substantial percentage of the lawsuits filed in the Eastern District of Texas are NPE cases.[92] While 13.4% of all patent decisions in the country are made by the Eastern District of Texas, that court decided only 8.2% of the operating company cases but more than one–quarter (26.9%) of NPE cases. Indeed, a substantial majority of all the patent cases decided in the Eastern District of Texas were NPE cases. The odds against that being a random effect are quite small ($p < 0.001$). Three other districts have a greater than proportionate share of NPE decisions: the Central District of California, which accounted for only 5.9% of all decisions but 9.1% of NPE decisions, and the Northern District of Illinois, with 4.2% of all decisions but 8.7% of NPE decisions.[93] Every other district, including the popular District of Delaware, representing almost as many decisions as the Eastern District of Texas, disproportionately decided operating company rather than NPE cases.[94] In three cases, the disproportion was striking: the Southern District of New York had only 1.9% of the NPE decisions but 6.2% of the practicing entity decisions, and the Western District of Wisconsin had only 1.1% of the NPE decisions but 3.7% of the practicing entity decisions.[95]

**Table 2a: Observations by District Proportions Among Top 4 Districts by Entity Type Compared with Overall District Proportions—Operating Companies vs. NPE**

| **Top Row = Frequency; Bottom Row = Percentage** | **Operating Co.** | **NPE** | **Total** | **Comparison of Proportions (Fisher's Exact test) p–value** |
|---|---|---|---|---|
| **TX ED** | 56 | 71 | 127 | |
| | 8.2% | 26.9% | | <0.001*** |
| **D ED** | 101 | 21 | 122 | |
| | 14.8% | 8.0% | | 0.005** |
| **CA ND** | 64 | 17 | 81 | |
| | 9.4% | 6.4% | | 0.156 |
| **CA CD** | 32 | 24 | 56 | |

92. *See* Cotropia et al., *supra* note 87.

93. The final district was the Northern District of Ohio, which had 1.8% of all decisions but 2.7% of NPE decisions. But, the difference was only statistically significant at the 90% confidence level (Fisher's Exact p–value = 0.074).

94. In the case of Delaware, however, the difference was significant only at the 90% confidence level ($p = 0.090$).

95. The final district was the Southern District of Texas, which accounted for 0.8% of NPE decisions but 2.9% of operating company decisions.

| | | | | |
|---|---|---|---|---|
| | 4.7% | 9.1% | | 0.014* |

**Table 2b: Observations by District Proportions Among Top 4 Districts by Entity Type Compared with Overall District Proportions—Operating Companies vs. NPE Subtypes**

| **Top Row = Frequency; Bottom Row = Percentage** | **Operating Co.** | **Univ.** | **Indiv.** | **Failed Startup** | **PAE** | **Total** |
|---|---|---|---|---|---|---|
| **TX ED** | 56 | 1 | 29 | 14 | 27 | 127 |
| | 8.2% | 7.7% | 26.1%** | 38.9%** | 26.0%** | |
| **D ED** | 101 | 0 | 2 | 5 | 14 | 122 |
| | 14.8% | 0.0% | 1.8%** | 13.9% | 13.5% | |
| **CA ND** | 64 | 1 | 3 | 1 | 12 | 81 |
| | 9.4% | 7.7% | 2.7%* | 2.8% | 11.5% | |
| **CA CD** | 32 | 0 | 11 | 2 | 11 | 56 |
| | 4.7% | 0.0% | 9.9%* | 5.6% | 10.6%* | |

When we separate the larger class of NPEs into constituent subgroups, we find that university suits follow a different pattern than other NPEs. No district had more than one decided university case. While we counsel caution because there are only 13 university patents spread across 8 lawsuits, this finding is likely a function not only of the small number of university cases in our data set, but also of the fact that universities tend to file suit where they are located and may settle or press cases for different reasons than other parties; only 27.8% of overall patent decisions were outside the top 13 districts, compared with 69.2% of university patent decisions.

Excluding universities, the Eastern District of Texas remained quite popular in deciding disputes involving all other types of NPEs. Failed startups, in particular, were likely to have their patents ruled upon there; 38.9% of failed startup decisions nationwide were in the Eastern District of Texas. But, both individuals and PAEs litigated more than a quarter of their nationwide decisions in the Eastern District of Texas, compared to only

8.2% of operating companies. The District of Delaware is noted for the paucity of cases brought by individuals; only 1.8% were adjudicated there, compared with 12.9% overall. Once universities and individuals are discounted, Delaware proved about as popular with PAEs and failed startups as with operating companies; they each had decided about the same percentage of cases there.[96] One other interesting finding is that several districts in the Northeast with substantial numbers of patent cases—the District of Massachusetts, the District of New Jersey, and the Southern District of New York—had *no* PAE decisions at all in our data set. By contrast, the Northern District of California, often considered a pro–defense jurisdiction, actually had a higher percentage of PAE cases (11.5% of those decided nationwide) than of operating company cases 9.4%).[97] Our data does not reveal whether this is because of initial lawsuit filings or settlement behavior.[98]

Finally, we note that all other districts combined showed no significant variation in the proportion of entity types. To the extent different entities are engaged in forum selection, it appears to be focused on the most popular districts.

**Table 3a: Declaratory Judgments Proportions Between Entity Types Compared with Overall Entity Proportions—Operating Companies vs. NPE**

| **Top Row = Frequency; Bottom Row = Percentage** | **Operating Co.** | **NPE** | **Total** | **Comparison of Proportions (Fisher's Exact Test) p–value** |
|---|---|---|---|---|
| **Declaratory Judgments** | 62 | 24 | 86 | |
| | 9.1% | 9.1% | | >0.999 |

**Table 3b: Declaratory Judgments Proportions Among Entity Types Compared with Overall Entity Proportions—Operating Companies vs. NPE Subtypes**

96. Each of these differences is significant (ED Texas p = 0.001; Delaware p = 0.039).

97. Our cases include both plaintiff–filed suits and declaratory judgment actions, and some of those results may represent declaratory judgment claims filed against PAEs in the Northern District of California. Interestingly, however, we find that accused infringers are not significantly more likely to file declaratory judgment actions against NPEs than against operating companies in the cases that went to judgment. Table 3a reports the number and percentage of cases in which declaratory judgment actions were filed and adjudicated against operating companies and NPEs as a whole, and Table 3b reports the numbers and percentages of declaratory judgment cases brought and decided against operating companies and the several NPE subtypes. *Accord* Risch, *supra* note 9, at 98.

98. We did not capture information about cases transferred from one venue to another. We treated each case as adjudicated in the venue that ruled upon the merits issue.

| Top Row = Frequency; Bottom Row = Percentage | Operating Co. | Univ. | Indiv. | Failed Startup | PAE | Total |
|---|---|---|---|---|---|---|
| **Declaratory Judgments** | 62 | 0 | 11 | 4 | 9 | 86 |
| | 9.1% | 0.0% | 9.9% | 11.1% | 8.7% | |

*3. Technology and Industry*

We find very substantial differences between operating company and NPE adjudicated suits by technology and industry area. More than a third of all operating company decisions involved mechanical patents, while less than one in seven NPE cases did (34.51% of operating company suits vs. 13.6% of NPE suits). Over a fifth (21.9%) of operating company suits involved chemistry patents, while only 1.9% of NPE cases did. The biggest difference was in software: 22.8% of operating company cases litigated to judgment involved software patents, while a whopping 65.9% of NPE suits did.[99] The differences in likelihood of NPE assertion by technology in mechanical, chemical, biotechnology, and overall software are all statistically significant. We present the results in Figures 2 and 3, with additional details provided in Tables A4 and A5 in the Appendix.

**Figure 2: Percentage of Observations by Primary Technology—Operating Company vs. NPE**

99. We report here only the results for categorizing each patent into one primary, mutually–exclusive technology category. We ran an alternative specification in which those patents also covering a secondary but still integral technology category were assigned to one or more secondary technology fields. Approximately 30% of the patents in our data set covered at least one secondary technology area. This alternative approach better captures the nuance of certain technologies, but does so at the cost of abandoning mutually–exclusive technology categories. The results were largely similar to what we describe in text for primary technology areas alone.

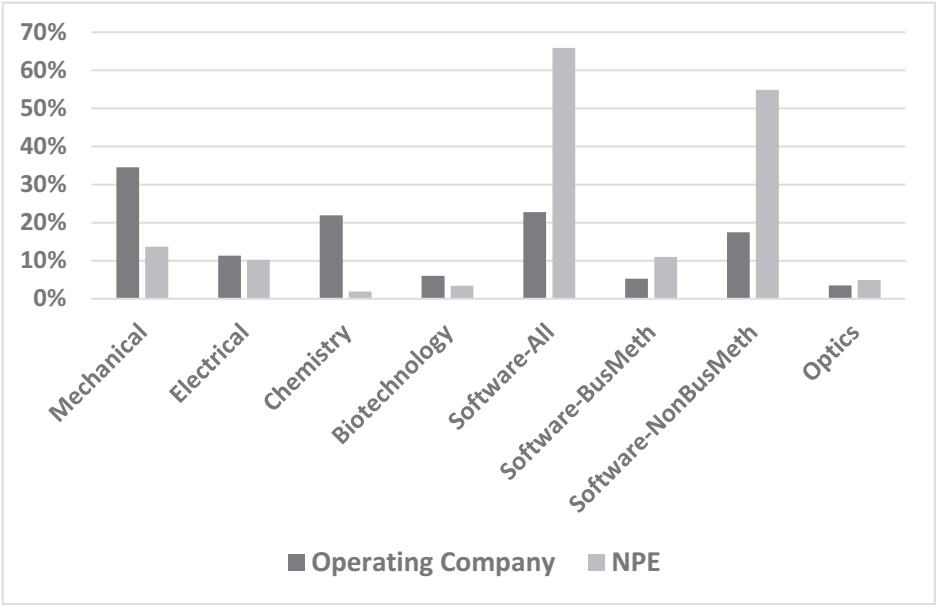
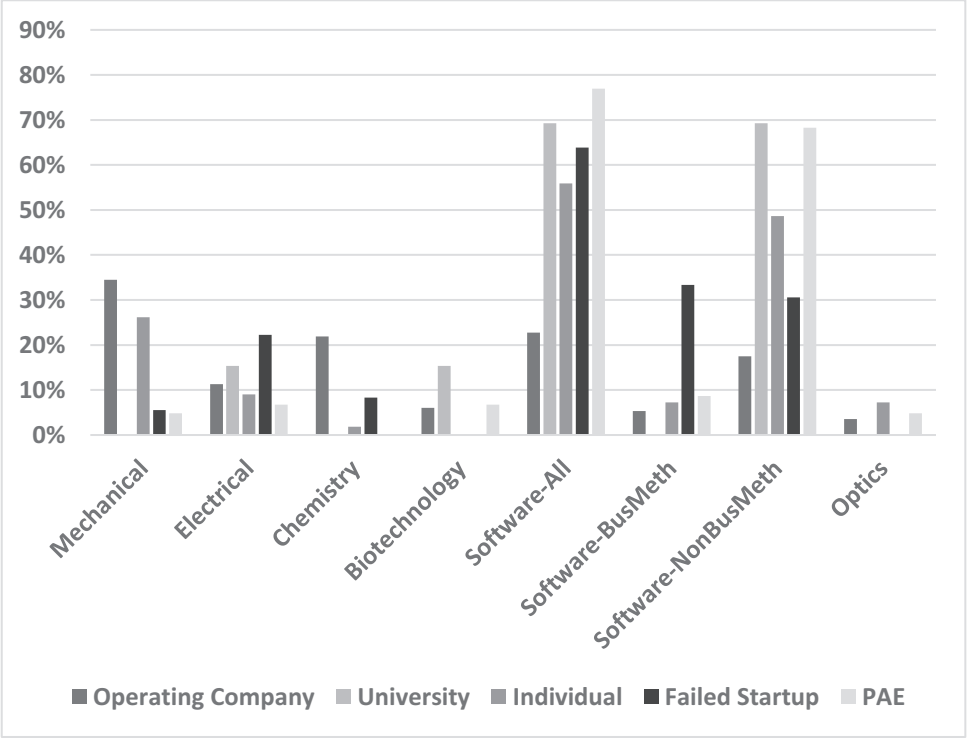

70%
60%
50%
40%
30%
20%
10%
0%
Mechanical
Electrical
Chemistry
Biotechnology
Software-All
Software-BusMeth
Software-NonBusMeth
Optics
Operating Company
NPE

**Figure 3: Percentage of Observations by Primary Technology[100]—Operating Company vs. NPE Subtypes**




Breaking those numbers down by type of NPE reveals some interesting facts. Every type of NPE decision, including universities, was heavily focused on software patents. Indeed, software and business method patents constituted a majority of decisions for every type of NPE: PAEs had 76.9% of their decisions in software, while universities, generally thought to be more active in the life sciences, were close behind with 69.2% of their decided cases involving software.[101] On the other hand, PAEs were not heavily invested in mechanical (only 4.8% of their decisions) or electrical patent litigation (only 6.7%), nor were they involved in a single chemistry

100. The bar represents the percentage of suits brought by a particular entity type that are in the listed technology. The categories are mutually exclusive, except that "software-all" is a sum of "software-business methods" and "software-non business methods."

101. While universities are generally thought of as patenting primarily in the life sciences, one of the authors has previously identified this trend of increased university activity in both patenting and litigating in the software space. Arti K. Rai, John R. Allison & Bhaven N. Sampat, *University Software Ownership and Litigation: A First Examination*, 87 N.C. L. REV. 1519, 1522–25 (2009).

case decided in our data set. Surprisingly, however, PAEs did play a significant role in biotechnology litigation. Biotechnology actually represents a slightly higher percentage of PAE suits that reached the merits (6.7%) than it does of operating company suits that reached the merits (6.0%). Nevertheless, most biotechnology decisions—like most decisions of all types—involved operating company plaintiffs.[102]

Figure 4[103] and Table 5 tell a somewhat similar, if less dramatic, story by industry affected.[104] Software patents are scattered through various industries, but NPEs have an outsized influence in the computer and electronics industries (accounting for 27.7% of NPE decisions but only 8.2% of operating company decisions) and the communications industry (accounting for 20.5% of NPE decisions but only 10.1% of operating company cases). Furthermore, breaking down the NPEs into subtypes reveals that PAEs are even more overrepresented in those industries: computer and electronics accounted for 35.6% of PAE suits that reached the merits, and communications accounted for another 23.1%. Operating companies, by contrast, are far more prevalent in the pharmaceutical, medical device, and energy industries.

102. *See* Robin Feldman & W. Nicholson Price II, *Patent Trolling: Why Bio and Pharmaceuticals Are at Risk*, 17 STAN. TECH. L. REV. 773, 796–808 (2014) (arguing that university patents in the life sciences may be attractive to "trolls").

103. Table 5 provides the underlying data used to generate Figure 4.

104. We explain the difference between technology and industry classifications in detail in our prior paper. Allison et al., *supra* note 27, at 1084. Technology categories reflect the nature of the invention itself, while industry categories reflect the market in which that invention is deployed. *Id.*

**Figure 4: Proportions Among Industries by Entity Type Compared with Overall Industry Proportions—Operating Companies vs. NPE**

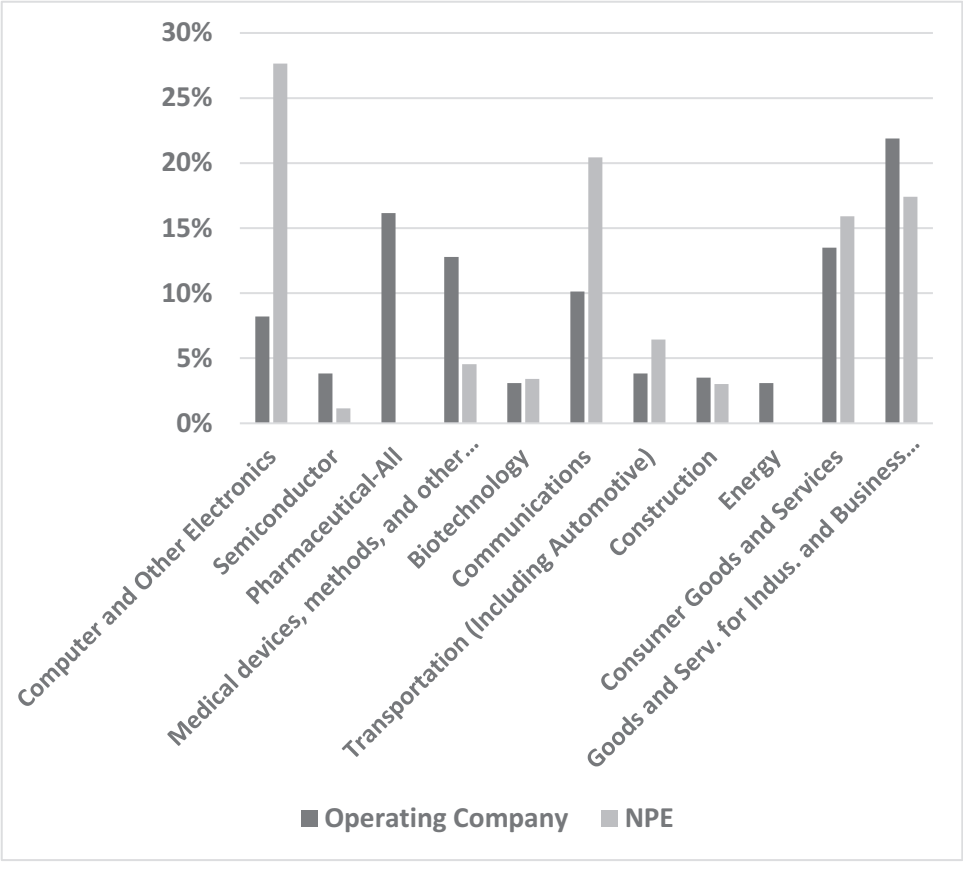



**Table 5: Proportions Among Industries by Entity Type Compared with Overall Industry Proportions—Operating Companies vs. NPE Subtypes**

| Top Row = Frequency; Bottom Row = Percentage | Operating Co. | Univ. | Indiv. | Failed Start–Up | PAE | Total |
|---|---|---|---|---|---|---|
| **Computer and Other Electronics** | 56 | 5 | 21 | 10 | 37 | 129 |
| | 43.4%*** | 3.9%** | 16.3% | 7.8%* | 28.7%*** | |
| **Semiconductor** | 26 | 2 | 1 | 0 | 0 | 29 |
| | 89.7%* | 6.9%** | 3.4% | 0.0% | 0.0% | |
| **Pharmaceutical** | 110 | 0 | 0 | 0 | 0 | 110 |
| | 100.0%*** | 0.0% | 0.0%*** | 0.0%* | 0.0%*** | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **ANDA Case** | 101 | 0 | 0 | 0 | 0 | 101 |
| | 100.0%*** | 0.0% | 0.0%*** | 0.0%* | 0.0%*** | |
| **Medical Devices, Methods, and Other Medical** | 87 | 3 | 7 | 2 | 0 | 99 |
| | 87.9%*** | 3.0% | 7.1% | 2.0% | 0.0%*** | |
| **Biotechnology** | 21 | 2 | 0 | 0 | 7 | 30 |
| | 70.0% | 6.7%* | 0.0%* | 0.0% | 23.3%* | |
| **Communication** | 69 | 1 | 21 | 8 | 24 | 123 |
| | 56.1%*** | 0.8% | 17.1%* | 6.5% | 19.5%*** | |
| **Transportation (Including Automotive)** | 26 | 0 | 14 | 0 | 3 | 43 |
| | 60.5% | 0.0% | 32.6%*** | 0.0% | 7.0% | |
| **Construction** | 24 | 0 | 8 | 0 | 0 | 32 |
| | 75.0% | 0.0% | 25.0%* | 0.0% | 0.0%* | |
| **Energy** | 21 | 0 | 0 | 0 | 0 | 21 |
| | 100.0%** | 0.0% | 0.0% | 0.0% | 0.0% | |
| **Consumer Goods and Services** | 92 | 0 | 15 | 8 | 19 | 134 |
| | 68.7% | 0.0% | 11.2% | 6.0% | 14.2% | |
| **Goods and Serv. for Indus. and Business Uses** | 149 | 0 | 24 | 8 | 14 | 195 |
| | 76.4% | 0 | 12.3% | 4.1% | 7.2% | |
| **Total** | 681 | 13 | 111 | 36 | 104 | 1046 |

These descriptive results largely confirm conventional wisdom about NPE behavior: The Eastern District of Texas disproportionately decides NPE lawsuits—especially those brought by PAEs—and adjudicated PAE lawsuits overwhelmingly involve software patents. Other results, however, are more surprising, including the software–heavy nature of university patent adjudications (although, admittedly, the number of observations is very small), as well as the presence of PAEs in the biotechnology industry.

## B. LITIGATION OUTCOMES

Operating companies won more often than NPEs in our data set. We report the results in Tables 6a and 6b for four litigation outcomes, organized

first by operating companies vs. NPEs, and then by operating companies vs. the NPE subtypes. Following Tables 6a and 6b, we present bar graphs showing "patentee definitive wins"[105] by operating companies vs. NPE and by operating companies vs. NPE subtypes. We provide results from thirteen additional litigation outcomes in the Appendix in Tables A6 and A7.

The overall definitive patentee win rate in our data set for cases that went to a final judgment is 25.8%. This is consistent with prior work showing that patentees win approximately a quarter of their cases.[106] Operating companies' success rates in adjudicated cases is more than twice as high as NPEs: operating companies won definitive rulings 30.6% of the time, compared to only 14.4% for NPEs.[107] That difference is statistically significant at a high level of confidence. In fact, NPEs did worse than operating companies on most of the outcomes represented in our dataset. However, the differences between NPEs and operating companies on several litigated issues were not statistically significant, including—notably—grants of summary judgment of non–infringement. As described in the Appendix, we found statistically significant results for: invalidity based on claim indefiniteness (found 10.5% of the time it was ruled upon against operating companies, but 31.7% of the time against NPEs), invalidity based on inadequate disclosure (found 16.8% of the time it was ruled upon against operating companies, but 75% of the time against NPEs), and inducing and contributory infringement.

105. A "definitive win" by a patent owner occurred when the patent owner received a favorable final judgment on all infringement and validity issues that were contested in the case. With respect to infringement, identifying a court decision as a "win" by the patent owner means that it prevailed on at least one of its asserted claims.

106. *See* Allison, Lemley & Schwartz, *supra* note 8, at 1778–81; Paul M. Janicke & LiLan Ren, *Who Wins Patent Infringement Cases?*, 34 AIPLA Q.J. 1, 8 (2006) (finding a 26% overall win rate ten years ago). It is interesting that the win rate was essentially the same in 2008–2009 as it was ten years ago, given the large increase in PAE litigation in this time frame and other changes to the patent law in the interim. *See* Mark A. Lemley, *The Surprising Resilience of the Patent System* 27–30 (Stanford Pub. Law, Working Paper No. 2784456, 2016) (making this point). One of the authors has explained the low patentee win rate as a function of the structure of patent litigation, in which winning on even one issue is usually enough for an accused infringer to defeat a suit, while the patentee must prevail on every issue in order to win. Mark A. Lemley, *The Fractioning of Patent Law*, *in* INTELLECTUAL PROPERTY AND THE COMMON LAW 504, 506 (Shyamkrishna Balganesh ed., 2013). Consistent with that hypothesis, patentees of all stripes do much better in interim rulings (such as denials of summary judgment) than they do in final rulings.

107. For this result we do not control for industry or technology, and we compare only operating companies to all other entity types.

**Figure 5: Patent Owner Definitive Winner—Operating Companies vs. NPE**

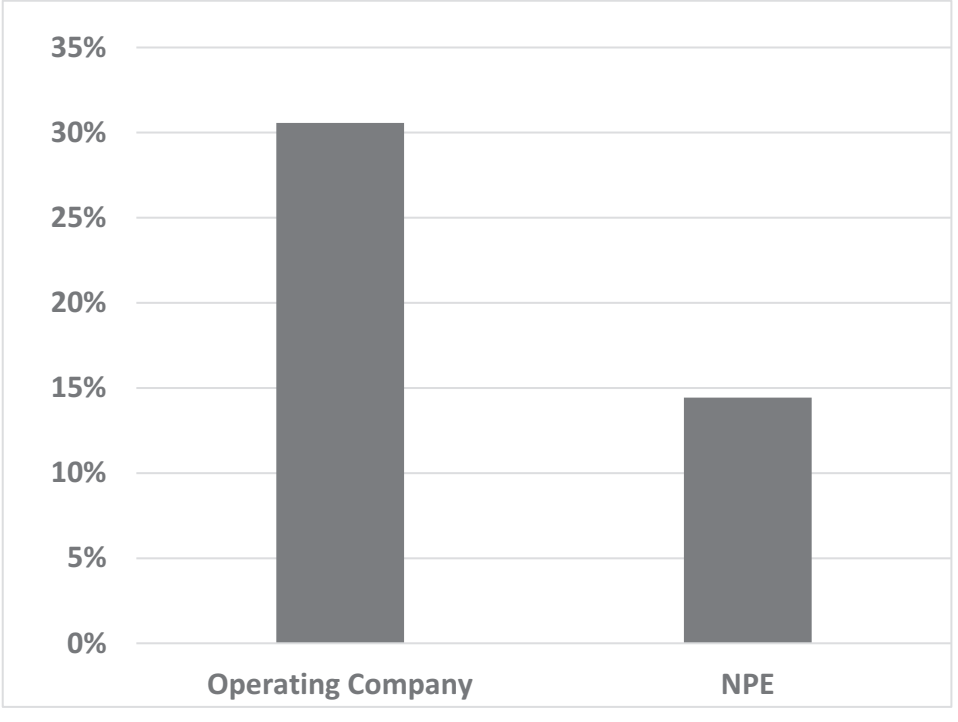


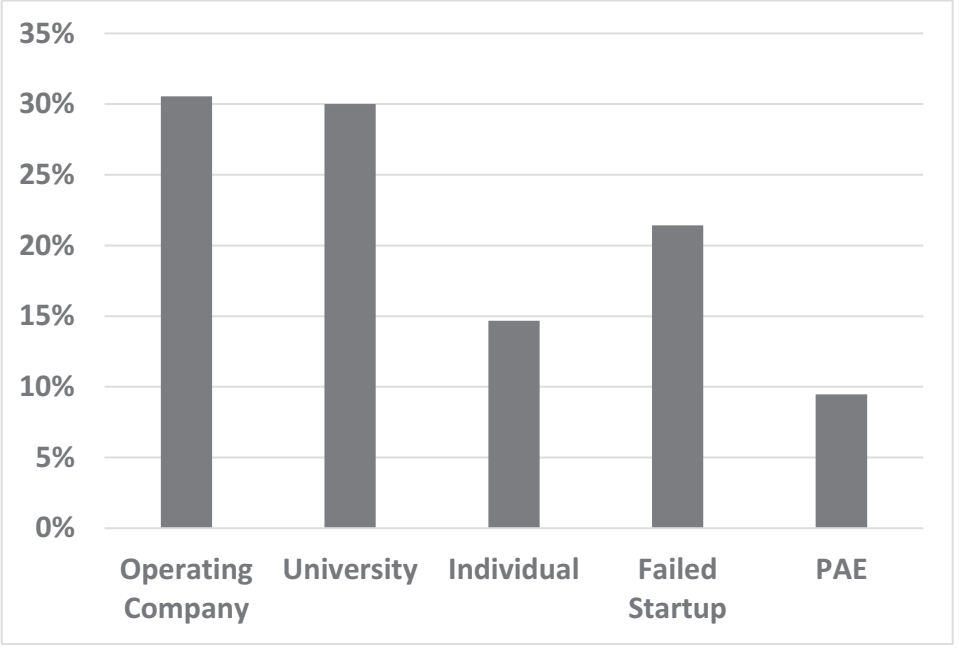
**Table 6a: Litigation Outcomes Compared Between Entity Types—Operating Companies vs. NPE**

| **Top Row = Frequency; Bottom Row = Percentage** | **Operating Co.** | **NPE** | **Total** | **Comparison of Proportions (Fisher's Exact test) p–value** |
|---|---|---|---|---|
| **Patent Owner Interim Winner** | 222 | 69 | 291 | |
| | 41.8% | 30.1% | | 0.003** |
| **Patent Owner Definitive Winner** | 136 | 27 | 163 | |
| | 30.6% | 14.4% | | <0.001*** |
| **SJ Invalid.—All Grounds** | 87 | 44 | 131 | |
| | 26.9% | 42.3% | | 0.005** |
| **SJ Non–infring.** | 172 | 83 | 255 | |
| | 51.8% | 59.7% | | 0.129 |
| **Total Direct Infring.—Any Stage** | 160 | 37 | 197 | |
| | 42.4% | 22.4% | | <0.001*** |
| **Patent Owner Trial Winner** | 142 | 33 | 175 | |
| | 60.9% | 60.0% | | 1.000 |

**Table 6b: Litigation Outcomes Compared Among Entity Types—Operating Companies vs. NPE Subtypes**

| **Top Row = Frequency; Bottom Row = Percentage** | **Operating Co.** | **Univ.** | **Indiv.** | **Failed Startup** | **PAE** | **Total** |
|---|---|---|---|---|---|---|
| **Patent Owner Interim Winner** | 222 | 2 | 35 | 8 | 24 | 291 |
| | 41.8% | 22.% | 35.4% | 26.7% | 26.4%** | |
| **Patent Owner Definitive Winner** | 136 | 3 | 11 | 6 | 7 | 163 |
| | 30.6% | 30.0% | 14.7%** | 21.4% | 9.5%** | |
| **Patent Owner Definitive Winner + Interim Winner** | 358 | 5 | 46 | 14 | 31 | 454 |
| | 52.6 | 38.5 | 41.4** | 38.9 | 29.8** | |
| **SJ Invalid.—All Grounds** | 87 | 0 | 23 | 7 | 14 | 131 |
| | 26.9% | 0.0% | 41.8%* | 50.0% | 50.0%* | |
| **SJ Non–infring.** | 172 | 3 | 38 | 9 | 33 | 255 |
| | 51.8% | 42.9% | 63.3% | 47.4% | 62.3% | |
| **Total Direct Infring.—Any Stage** | 160 | 3 | 16 | 6 | 12 | 197 |
| | 42.4% | 30.0% | 29.6% | 25.0% | 15.6%** | |
| **Patent Owner Trial Winner** | 142 | 3 | 12 | 10 | 8 | 175 |
| | 60.9% | 100.0% | 37.0% | 85.7% | 72.6% | |

**Figure 6: Patent Owner Definitive Winner—Operating Companies vs. NPE Subtypes**




Here, we count all definitive and interim wins for the patentee in our dataset. Interim wins are cases without either party winning in full on the merits, such as cases with summary judgment being denied. Most interim wins in our dataset were patentee interim wins—denials of summary judgment followed by a settlement. Some were coded as accused infringer interim wins, such as a grant of summary judgment of no literal infringement coupled with a denied of summary judgment of no infringement under the doctrine of equivalents. The foregoing example is ambiguous as to which party prevailed. While the accused infringer has narrowed the case, it did not narrow it as much as it sought. It may have substantially improved its litigation position, reducing the value of the case to near zero. Or it may have not materially improved its position at all, since it must face a jury on the infringement allegation. Other accused–infringer interim wins are less ambiguous, as when a patentee moves for summary judgment on an inequitable conduct defense and that motion is denied. In Table 6b, we count what we coded as accused infringer interim wins as patentee losses. However, some may view it as more appropriate to count what we coded as accused infringer interim wins as patentee wins. If one were to presume that all settlements involve some payment to the patentee, one would add all interim wins to patentee definitive wins. If we so count, the results are largely the same as the results reported in the above table.

Operating companies prevail 54.6% (372) of the time, universities 46.2% (6), individuals 42.3% (47), failed startups 38.9% (14), and PAEs 35.6% (37). But it may well be that many or even most of the cases that were settled or dropped after an interim ruling were dismissed without a payment, in which case none of them should be included. The short answer is that there is no way to tell what happened in a confidential settlement.

Breaking NPEs down into subtypes reveals considerable variation in the performance of different kinds of NPEs, though no NPE subtype performed as well overall as operating companies. Even so, operating companies themselves did not win even a third of their cases that reached a final judgment. Universities fared almost as well in court as operating companies, winning 30% of the time (compared to 30.6% for operating companies). Failed startups did less well—but still fared better than NPEs as an overall class—winning 21.4% of the definitive rulings in their cases. Individuals fared worse than startups, winning just 14.7% of the definitive rulings. And finally, PAEs performed the worst, winning only 9.5% of the definitive rulings on patents in their cases. These differences in overall win rate by entity status are statistically significant.

PAEs also performed significantly worse than operating companies on summary judgment of invalidity (losing 50% of the time the issue was decided, compared to 26.9% for operating companies) and on direct infringement (winning only 15.6% of the time the issue is decided, compared with 42.4% for operating companies). On inadequate disclosure (failure to comply with either the enablement, separate written description, or best mode requirements), however, PAEs performed better, although they still fared worse than operating companies (losing 22.7% of the time the issue was decided, compared with 16.8% for operating companies). Individual–owned patents fared particularly poorly when their validity was challenged for inadequate disclosure (losing 77.8% of the time the issue was raised). This difference was statistically significant, though the number of observations was only eight. Interestingly, PAEs, failed startups, and universities all did better at trial than operating companies did, though the difference is not statistically significant when tested in a multiple regression that takes other influences into account.

### C. Litigation Outcomes by Industry

Finally, we wanted to see how our results were affected by two important industry and technology areas: pharmaceutical industry ANDA

cases against companies that make generic equivalents of patented drugs,[108] and software technology patent cases. To do this, we separated each type of case from the others.

There were 87 ANDA cases in our data set that produced a definitive result. Not one involved an NPE. That is not surprising, since ANDA cases are only filed when a generic pharmaceutical company wants to produce a product that is bioequivalent to a pharmaceutical product that is already on the market. Thus, by definition, the plaintiffs in ANDA cases are operating companies. Of the 87 definitive decisions in ANDA cases, forty–eight, or 55.2%, were patentee wins.[109] Removing those cases from the data set, the NPE win rate remains unchanged at 14.4%, but the non–ANDA operating company win rate drops somewhat, to 24.6%. We present the results in Tables 7a and 7b.

**Table 7a: Patent Owner Definitive Winner (Excluding ANDA Cases)—Operating Companies vs. NPE**

| **Top Row = Frequency; Bottom Row = Percentage** | **Operating Co.** | **NPE** | **Total** | **Comparison of Proportions (Fisher's Exact test) p–value** |
|---|---|---|---|---|
| **Patent Owner Definitive Winner (Excluding ANDA Cases)** | 88 | 27 | 115 | |
| | 24.6% | 14.4% | | 0.006** |

**Table 7b: Patent Owner Definitive Winner (Excluding ANDA Cases)—Operating Companies vs. NPE Subtypes**

| **Top Row = Frequency; Bottom Row = Percentage** | **Operating Co.** | **Univ.** | **Indiv.** | **Failed Startup** | **PAE** | **Total** |
|---|---|---|---|---|---|---|
| **Patent Owner Definitive Winner** | 88 | 3 | 11 | 6 | 7 | 115 |

108. For discussion of the Hatch–Waxman Act, which set up a procedure for Abbreviated New Drug Applications (ANDAs) by generic companies who want to make a drug bioequivalent to an existing drug, see, e.g., C. Scott Hemphill & Mark A. Lemley, *Earning Exclusivity: Generic Drug Incentives and the Hatch-Waxman Act*, 77 ANTITRUST L.J. 947 (2011).

109. This number differs slightly from the 52.1% pharmaceutical industry win rate we reported in Allison et al., *supra* note 27, at 1098, because a small number of pharmaceutical industry cases were not ANDA cases, and so are not included in the count here.

| (Excluding ANDA Cases) | | | | | | |
|---|---|---|---|---|---|---|
| | 24.6% | 30.0% | 14.7% | 21.4% | 9.5%** | |

We also ran the results after separating all primary software cases from those that were not software. We present the results in Tables 8 and 9. Table 8 shows that operating companies actually do slightly worse than NPEs in enforcing software patents, winning 12.4% of the definitive rulings (compared with 14.5% for NPEs). This is not a statistically significant difference, however. No matter who owns them, software patents as a whole fare worse in cases that do not settle before a final merits ruling than other types of patents, with an average win rate in definitive rulings of just 13.6%, compared with a 32.6% win rate overall for non–software patents.[110]

**Table 8a: Patent Owner Definitive Winner (Only for Primary Software)—Operating Companies vs. NPE**

| Top Row = Frequency; Bottom Row = Percentage | Operating Co. | NPE | Total | Comparison of Proportions (Fisher's Exact test) p–value |
|---|---|---|---|---|
| Patent Owner Definitive Winner (Only for Primary Software) | 12 | 18 | 30 | |
| | 12.4% | 14.5% | | 0.696 |

**Table 8b: Patent Owner Definitive Winner (Only for Primary Software)—Operating Companies vs. NPE**

| Top Row = Frequency; Bottom Row = Percentage | Operating Co. | Univ. | Indiv. | Failed Startup | PAE | Total |
|---|---|---|---|---|---|---|
| Patent Owner Definitive Winner (Only For | 12 | 3 | 4 | 5 | 6 | 30 |

110. Notably, that lower software patent win rate comes from decisions before the Supreme Court's 2014 ruling in *Alice Corp. v. CLS Bank International*, 134 S. Ct. 2347 (2014), which led to a spate of invalidations of software patents in the last year because of lack of patentable subject matter. *See, e.g.*, Robert Sachs, *A Survey of Patent Invalidations Since* Alice, LAW360 (Jan. 13, 2015, 10:25 AM), http://www.law360.com/articles/604235/a-survey-of-patent-invalidations-since-alice. So, the effective win rate of software patents today is likely quite a bit lower than it was in the period of our study.

| Primary Software) | | | | | | |
|---|---|---|---|---|---|---|
| | 12.4% | 37.5% | 26.2% | 26.3% | 10.9% | |

Notably, however, different NPEs vary widely in their success rate with software patents. Operating companies and PAEs fare the worst, winning just 12.4% and 10.9% of the time a merits ruling is made, respectively. But both failed startups and universities do substantially better than operating companies at enforcing software patents through judgment.

Once software patents are excluded, patentees overall do better, winning 32.4% of the non–software cases with a definitive resolution. But operating companies do much better than NPEs; they win 35.6% of the non–software cases with a merits ruling, compared with only a 14.3% win rate for NPEs. It should be noted that there were only 9 observations for NPEs.[111]

**Table 9a: Patent Owner Definitive Winner (Excluding Primary Software)—Operating Companies vs. NPE**

| Top Row = Frequency; Bottom Row = Percentage | Operating Co. | NPE | Total | Comparison of Proportions (Fisher's Exact test) p–value |
|---|---|---|---|---|
| Patent Owner Definitive Winner (Excluding Primary Software) | 124 | 9 | 133 | |
| | 35.6% | 14.3% | | 0.001*** |

**Table 9b: Patent Owner Definitive Winner (Excluding Primary Software)—Operating Companies vs. NPE Subtypes**

| Top Row = Frequency; Bottom Row = Percentage | Operating Co. | Univ. | Indiv. | Failed Startup | PAE | Total |
|---|---|---|---|---|---|---|

111. Notably, most NPE cases in our data set were software patents; there were 124 definitive resolutions of NPE software patents but only 63 NPE non–software cases that went to judgment. Remarkably, eight of the ten university patent cases that went to judgment in our data set were software patent cases. But every type of NPE litigated more software than non–software cases in our data set, even though software cases accounted for just over a third of the whole data set.

| | | | | | | |
|---|---|---|---|---|---|---|
| **Patent Owner Definitive Winner (Excluding Primary Software)** | 124 | 0 | 7 | 1 | 1 | 133 |
| | 35.60% | 0.00% | 21.20% | 11.10% | 5.3%** | |

No NPE did particularly well in the fully adjudicated non–software patents. Excluding universities, which took only two non–software cases to judgment in our data set (and lost both), PAEs won a surprisingly small 5.3% of their non–software cases. Individuals, by contrast, did better in non–software than in software cases, winning 21.2%.

From our data, the definitive win rate for software patents in the computer industry was not noticeably different from the win rate for software patents in other industries. The definitive win rate for software patents in the computers and other electronics industry was 13.8% (8 out of 58) and the definitive win rate for software patents outside that industry was 13.5% (22 out of 163), a difference that is not statistically significant.

### D. MULTIVARIATE REGRESSIONS

In our prior papers, we have explored the relationships between various characteristics of the patent, patent owner, court, and patent's technology and industry in influencing the outcome of cases. We have already seen that many of those characteristics differentially are correlated with operating company and NPE litigation. For instance, more NPEs file suit in the Eastern District of Texas.[112] In the cases that reach a merits ruling, the Eastern District of Texas is more likely to rule for patentees than other districts.[113] The Eastern District of Texas is also more likely to issue merits rulings than the average judicial district.[114] NPEs are also more likely to enforce software patents. Software patents that reach a final judgment are less likely to prevail.[115] In this Section, we combine our work on entity status with the work in our prior papers to see whether those other factors explain the differences between operating companies and various types of

112. Cotropia et al., *supra* note 87.
113. Allison, Lemley & Schwartz, *supra* note 8, at 1791–92.
114. *Id.* at 1779 tbl.1.
115. Allison et al., *supra* note 27, at 1097 (noting that while the overall success rate is 26%, software patents have a rate of 13.5%).

NPEs. Our goal in using a regression is to assess whether the various measures of case success are higher for operating companies than NPEs, while at the same time controlling for a variety of factors that may compromise the assessment. One risk in doing so is that because we explore so many variables, there may simply not be enough observations to find statistical significance.[116]

We ran various alternative formulations of the logistic regression model.[117] Because of the high correlation between technology and industry variables, we could not include both technology and industry in the same model. For similar reasons, we could not include both primary technologies as well as primary and secondary technologies in the same model. The model on which we ultimately focus includes controls for entity status (both NPEs as a whole and each NPE subtype separately), a variety of characteristics of the patent and the lawsuit, the three busiest patent litigation districts, and our various technology categories. We report the results in Tables A8 (for all NPEs) and A9 (for NPEs separated into subtypes) in the Appendix.[118] We also performed various robustness checks, running additional regression models for the following litigation outcomes: patentee definitive wins; summary judgment of invalidity;

116. Sometimes, because of the numbers of observations, it is not possible to perform regression analysis at all when the number of variables reaches a certain point (a problem with the available "degrees of freedom"), much less to find statistical significance.

117. A full set of the results of alternative specifications is available from the authors upon request.

118. A cautionary note about our logistic regression analyses is required: when running multiple tests from the same data set, it is possible to obtain one or more findings of statistical significance by pure chance (the "false discovery rate," or the "FDR" problem). It is rare for a researcher in the social sciences to even mention the problem, because available corrective techniques are too punitive by a large factor. These techniques were created for use in studies in which thousands of tests were performed using the same data set. We want to call readers' attention to the issue, however, and caution that there could be a small number of findings of significance in our results that are "false positives"—findings of significance that are not real. Thus, one should be hesitant to consider findings of significance at the $p < 0.10$ level meaningful. It is also possible that a small number of findings at p–values below $p < 0.05$ are not real. Many of our findings of statistical significance are at levels far below 0.05, and a number are at levels well below $p < 0.01$—levels that give us meaningful confidence that what we find is likely real. Concerns about false positives are also mitigated by the fact that our general results with respect to entity types are consistent among a series of different regression models. Moreover, as observed earlier, this is a population study and not a sample study. If one focuses only on the differences between entity types in the cases in our particular data set, these differences are significant by definition. However, if one wishes to extrapolate to cases outside our data set, one must deal with the various concerns about statistical significance.

summary judgment of non–infringement; summary judgment of non–infringement plus stipulated judgments; and patentee trial wins. For these outcomes, we included in our regression various subsets of the control variables reported in Table 10. In unreported results, we found that the entity status variable results are consistent across the various regression models.

On the overarching question of the likelihood of a patentee win, operating companies won a higher percentage of their cases than NPEs as a whole. After we took all other factors into account, the greater likelihood of an operating company win was not statistically significant at the standard 95% confidence level ($p = 0.0532$), but was at a 90% confidence level.[119] Notably, however, once we separated out ANDA cases and NPE cases, technology field was no longer a significant explanatory factor in patent owner wins.

Operating companies, then, were not demonstrably more likely than NPEs to win their patent cases when all other potentially explanatory factors were considered. The evidence does show that operating companies were significantly less likely to lose on summary judgment of both invalidity and noninfringement.

One reason for the weak significance findings in the operating company versus NPE comparison becomes evident when we break NPEs into their constituent parts. As Table A9 in the Appendix shows, compared with operating companies, universities are significantly more likely than operating companies to win.[120] Individuals and PAEs, by contrast, lost more often on summary judgment on both validity and infringement, though once we broke the categories apart the differences were not statistically significant. The reason NPE results are not statistically significant, in other words, is that NPEs are not a monolithic group.

## IV. IMPLICATIONS

There are important, policy–relevant questions related to how operating companies fare relative to NPEs in patent enforcement. Answering these

119. Some of our findings from prior studies retained their statistical significance in this one. Patentees were significantly more likely to lose cases originally brought as declaratory judgments. They were significantly more likely to win cases in the Eastern District of Texas, even after controlling for NPE status, and ANDA plaintiffs were significantly more likely to win.

120. Failed startups are not significantly less likely than operating companies to win their cases.

policy questions may inform the issues currently being considered by Congress, such as heightening the pleading standards in patent infringement complaints, limiting discovery before claim construction, and staying suits against allegedly infringing manufacturers' customers in certain circumstances.[121]

Our data helps to illuminate the differences between operating company and PAE litigation in cases that reach a final judgment. But it is only part of the picture. First, our dataset lacks any data on patent enforcement that does not result in litigation, such as that which occurs when demand letters from patent owners to accused infringers result in settlements, typically licenses in return for payment. Second, and more importantly, we lack information about litigated (filed) yet unadjudicated lawsuits. This category, which is comprised largely of voluntary settlements, accounts for approximately 90% of the patent cases filed in the time frame of our study.

Since we don't observe the cases that settle before a final decision, what can we make of our findings? The cases that reach a merits ruling are not a random sample of all filed cases. If the patent–cases in our dataset are representative of all patent lawsuits, then our data directly shed light on the important policy questions. But even if our dataset is not representative of all filed lawsuits, our findings are still relevant. First, they are directly relevant to debates that focus only on the outcomes of lawsuits as opposed to the litigation process, because we do have data on the cases that make it to final rulings.[122] Even as to cases that settle, our findings might still be significant. It may be that our findings *understate* the results on settled cases, which would mean that our results are even more telling. But it may be that they *overstate* the results, which would make the implications substantially narrower. We return to the issue of the direction of potential bias later.

Below, we first discuss some potential mechanisms by which filed cases reach (or don't reach) a merits decision, and how those mechanisms might skew the results. Some of these mechanisms would cause our findings to understate our results, while others would mean our findings are overstated. We then set forth the implications of our study—if one makes an assumption that our dataset is representative of all litigated patents.

121. *See* Innovation Act, H.R. 9, 114th Cong. (2015).

122. One of the authors, Schwartz, believes that the litigation policy–relevant debates are about how different types of entities participate in the litigation process, not the potentially biased and small subset of cases that reach a final judgment.

### A. CAUTIONS AND SELECTION EFFECTS

As we mentioned at the outset, there may be reasons to think the cases we study are not representative of all litigated cases. Some scholars have contended that the cases that are tried rather than settled are the closest cases—that is, the ones characterized by the greatest uncertainty about ultimate outcomes. More specifically, George Priest and Benjamin Klein have suggested that tried cases should have a 50% plaintiff win rate.[123] Our results, including the win–rate data from each type of entity, are inconsistent with the strong Priest–Klein 50% hypothesis. Subsequent law–and–economics literature provides a more nuanced set of factors that affect settlement and adjudication of disputes. This more recent literature argues that deviations from the 50% win rate can be caused by a variety of factors, including asymmetric stakes, costs, and risk profiles; information asymmetries; agency costs; endowment effects; and other complicating factors.[124]

At least 90% of filed lawsuits are not in our dataset because they settle. What do those 90% look like? Do they differ across entity types in the same or opposite ways from our dataset of adjudicated cases? Should they be treated as patentee wins? A few have argued that they should.[125] But the filed lawsuits not included in our analysis could just as easily be viewed as accused infringer wins; the point of a settlement is precisely that it is

123. George L. Priest & Benjamin Klein, *The Selection of Disputes for Litigation*, 13 J. LEGAL STUD. 1, 17–20 (1984). Others have criticized the relevance of the strong Priest–Klein theory to patent litigation. *See, e.g.*, Jason Rantanen, *Why Priest-Klein Cannot Apply to Individual Issues in Patent Cases* 3–8 (Univ. of Iowa Legal Studies, Research Paper No. 12-15, 2012), https://papers.ssrn.com/sol3/papers.cfm?abstract-id=2132810; David L. Schwartz, *Pre*-Markman *Reversal Rates*, 43 LOY. L.A. L. REV. 1073, 1101–07 (2010). And Steven Shavell has argued that Priest and Klein are wrong as a general matter of theory. Steven Shavell, *Any Frequency of Plaintiff Victory at Trial Is Possible*, 25 J. LEGAL STUD. 493 (1996).

124. *See, e.g.*, Kevin M. Clermont, *Litigation Realities Redux*, 84 NOTRE DAME L. REV. 1919, 1951–56 (2009) (discussing the difficulties in measuring outcomes because of the prevalence of settlements); Kevin M. Clermont & Theodore Eisenberg, *Litigation Realities*, 88 CORNELL L. REV. 119, 137–40 (2002) (discussing the effect of settlement on win rates); Daniel Kessler, Thomas Meites & Geoffrey Miller, *Explaining Deviations from the Fifty-Percent Rule: A Multimodal Approach to the Selection of Cases for Litigation*, 25 J. LEGAL STUD. 233, 237, 242–48 (1996) (considering "seven characteristics of cases that law-and-economics models predict would affect the plaintiff win rate in litigated cases within the divergent expectations framework").

125. *See, e.g.*, Christopher M. Holman, *Do Biotech Patent Lawsuits Really "Overwhelmingly Lose?": A Response to* Our Divided Patent System, 34 BIOTECHNOLOGY L. REP. 59 (2015).

acceptable to both parties. We have no data on settlements. If there were frequent unobserved high dollar amount settlements that differed substantially by entity type, it likely would affect our analysis.[126]

How we treat settlements depends upon the research question we seek to answer. If we are interested in how many cases have some legal merit, then it makes sense to include non–nuisance–value settlements. If, however, we are interested in how many cases would have won on the merits without settlement, then we think counting every settlement as a patentee win does not make any more sense than counting every settlement as a patentee loss. Parties settle because it is in their mutual interest to do so. The factors relevant for settlement include the merits of the case, but also the cost of pursuing it, the uncertainty and delay in getting a result, how much is at stake for each side, and how that result will affect other cases involving the parties. Settlements are important for the patent system, for they may drive behavior without regard to the merits of the dispute. Indeed, one type of PAE is interested only in nuisance–value settlement, and for them the merits of the patent should not matter at all.[127] But the fact that a defendant paid to settle a suit is not necessarily an indication that the suit was completely meritorious, any more than the fact that the plaintiff took a payment to drop the suit is a concession that it would have lost had the case gone to judgment.

We suspect that the type of entity that enforces the patent is related to why and how cases settle, with some differences even within the entity type categories we used. For instance, Lemley's "bottom–feeder trolls" and "lottery ticket trolls" may differentially settle—bottom–feeder settling almost everything and lottery–ticket settling almost nothing—but both are categorized the same in our entity coding. Below we explain in detail several potential reasons why the 90% of cases were unadjudicated, and set forth how each reason would affect our results. Some of these would result in our data understating differences between entity types, while others would overstate differences. And because of the nature of our study—evaluating only adjudicated disputes—even the regression model does not fix or control for the selection concerns. That said, our crude comparisons of unadjudicated cases to adjudicated cases in Table 14 provide some

126. Recent work raises some question as to whether cases that go to judgment differ materially from those that settle. *See infra* note 156. If they don't differ, much of the caution in this Section is unnecessary.

127. *See, e.g.*, Lemley & Melamed, *supra* note 1.

support for the view that the selection concerns do not undermine our results in a meaningful way.[128]

There are several selection mechanisms that would lead to even stronger differences between entity types than we have found. For instance, it may be that PAEs, more than operating companies, settle weaker cases and bring stronger cases to judgment. On this view, the only cases PAEs take to a ruling on summary judgment or later are their strongest cases. Operating companies, in contrast, often have business reasons to take weaker cases farther along.[129] If this were true, then even the low PAE win rate we reported would overstate the win rate of the unobserved (settled) cases. Thus, the population of PAE litigated cases would be even weaker than the ones litigated to judgment. But defendants in PAE cases likely have the opposite strategy, wanting to settle the cases they are likely to lose and litigating those they are likely to win. It is hard to predict the net effect.

Another reason that our results may be understated is that PAEs, individual inventors, and failed startups may be more likely to reach a merits ruling than operating companies because they sue more defendants on each patent. More defendants means that it is more likely that at least one defendant won't settle.[130] Back in the 2008 and 2009 time frame of the study, many defendants were often joined together in a single suit. This approach permitted defendants to enter into joint defense agreements and potentially lower their costs. Thus, more (and weaker) NPE patents would reach the merits phase. If this were true, then our results would understate the win rate of NPE patents if the unobserved cases were included.

Consistent with Lemley's "bottom–feeder troll" model, patent assertion entities may bring nuisance value litigation seeking payouts far, far below the cost of defense. Almost all of these nuisance value cases should rationally settle before a merits ruling. Thus, most of them are not in our dataset. And, logically, those patents should be weaker than most litigated patents because the plaintiff is unconcerned with the merits in deciding to sue. If bottom–feeder trolls made up a large portion of the settled cases, then the remaining PAE patents and cases that are in our dataset are the larger and stronger cases. If this is true, then our results would again overstate the win rate of PAE patents if the unobserved cases were included. Yet even with the bottom feeder example, the selection may cut in the opposite

128. It bears noting that, in addition to settlements and adjudications on the merits, there are procedural dispositions. We did not include non–patent procedural dispositions, such as dismissals for lack of personal jurisdiction, in our data.

129. Christopher M. Holman, *supra* note 125.

130. Risch, *supra* note 9; Allison et al., *supra* note 9, at 700.

direction. It may be that when numerous companies are accused of infringement, the ones with the best non–infringement positions maintain their cases until judgment. If this were true, then the litigated–to–judgment cases would be weaker (from the patentee's perspective) than the settled and unobserved cases.

But there are also several selection mechanisms that may cause our results to be overstated. For example, Erik Hovenkamp has argued that PAEs may litigate weak cases to a ruling (or close to a ruling) in order to gain a reputation as an aggressive litigant.[131] This could also be economically rational for repeat player NPEs. However, we are skeptical that this practice occurs on a widespread basis.[132] And to affect our results, it would have to be true more of NPEs than of patent defendants or operating company plaintiffs, both of which might also want to establish a similar reputation.[133] But if many PAEs utilized this strategy (and it outweighed patent defendants who also wanted to establish such a reputation), then our PAE win rate data would understate the expected win rate of the unobserved cases.

Additionally, NPEs may be more likely to litigate using a "war chest" strategy.[134] The war chest strategy involves asserting the patent against numerous parties, settling with weaker parties to finance the ongoing litigation, and then litigating more aggressively and longer against parties with deeper pockets. The aggressive litigation against the final defendants is partially because all of the other value of the patent has been obtained so there is a smaller downside to having the patent deemed invalid. There is

131. *See generally* Erik N. Hovenkamp, Predatory Patent Litigation: How Patent Assertion Entities Use Reputation to Monetize Bad Patents (Aug. 5, 2013) (unpublished Ph.D. dissertation, Northwestern University), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2308115.

132. Indeed, two of the authors have previously hypothesized the opposite—that repeat–player NPEs would be more risk averse, because losing a validity challenge to a patent even once prevents them from asserting that patent against anyone else. Allison, Lemley & Walker, *supra* note 9.

133. While we know of no empirical or even anecdotal evidence of NPEs playing hardball to establish a litigation reputation, we do know that some defendants do so. *See, e.g.*, Ivan Barajas, *When Will Patent Trolls Learn Not to Mess with Newegg?*, NEWEGG NEWSROOM (May 22, 2014), http://blog.newegg.com/patent-trolls-learn-mess-newegg/. And if defendants are litigating everything, even their weak cases, in order to establish a reputation, our results should overstate rather than understate the quality of all NPE patents. There is an argument that defendants generally do not litigate weak cases to judgment because of risk–aversion via agency costs. NPEs generally are not faced with these agency costs.

134. *See* Schwartz, *supra* note 22, at 344, 368–69.

also a smaller downside to taking more aggressive positions on infringement. If this strategy was commonly used by NPEs, then the adjudicated disputes could conceivably be weaker than the average litigation, which would mean that our results overstate the differences between the entities. But even that would not necessarily follow. NPEs on this hypothesis are asserting the same patent against multiple entities, so the validity of that patent should not significantly vary.[135] At most it should affect infringement results. Even then, the rational war chest strategy may turn more on what the defendant has at stake rather than on the strength of the infringement case. So, it is not necessarily true that the latter case that goes to judgment is harder to win, although PAEs may prefer to "swing for the fences" after receiving settlements from all of the other accused infringers. War chest PAEs may also rationally pursue weaker claims of infringement against the final defendants with the highest exposure.

Individual inventors and failed startups may also behave differently than other litigants. As the original inventors of the patents, they may be subject to certain endowment effects, believing that their invention is better than it is.[136] Moreover, individual inventors may be irrational with respect to settlement and have fewer people to whom they owe a fiduciary duty of care.[137] Table 3b provides limited evidence that individual inventors settle at different rates than other entity types. There is some experimental data suggesting that individual inventors sell to patent speculators because of the high cost of litigation, which is rational but also means that the categories we used are somewhat fluid.[138] Finally, failed startups may be willing to litigate until judgment rather than settle because the entity as a commercializing business has failed; there is nothing to focus on other than enforcement of the patent. Notably, these possible selection effects could explain some, but not all, of our results. In particular, they should not have an effect on our PAE results.

Other selection mechanisms are complicated and ambiguous as to how they would impact our results. Most NPEs have fewer reputational concerns

135. In practice, settlements in prior cases may serve as some evidence that the patent is non–obvious. *Id*. at 368–69.

136. Experimental evidence has suggested the existence of an endowment effect among inventors. *See, e.g.*, Christopher Buccafusco & Christopher Jon Sprigman, *The Creativity Effect*, 78 U. CHI. L. REV. 31 (2011).

137. Schwartz, *supra* note 25, at 59.

138. *See* Stephen H. Haber & Seth H. Werfel, *Patent Trolls as Financial Intermediaries? Experimental Evidence*, 149 ECON. LETTERS 64 (2016).

than operating companies.[139] One might expect NPEs unconstrained by these concerns to assert weaker patents. But pointing in the other direction is the fact that NPEs' primary assets are patents. It would be extremely bad for business if their patents were adjudicated invalid or not infringed. Their entire revenue stream for that patent could disappear, and they lack a commercial product from which to profit. For this reason, some have speculated that NPEs may be more risk averse than similarly situated practicing entities.[140]

PAEs, individuals, and failed startups all have fewer chances to settle cases than operating companies because they can't settle via a cross license or other business deal. On the other hand, NPEs are unlikely to be entitled to injunctive relief if they prevail.[141] Both of these characteristics affect settlement. Because NPEs are only interested in a monetary payment, they may be more likely to settle cases than companies whose incentives are asymmetric. The evidence that exists is mixed on differences between NPE and non–NPE settlement rates.[142] Thus, a marginal NPE case may reach judgment while a marginal operating company case may not, or vice versa. It is hard to assess which way this would cut if true. It depends on whether the additionally settled cases are stronger or weaker than average.

The nature of plaintiffs' lawyers may also matter. Settlement dynamics are strongly related to whether the plaintiff is represented on an hourly basis, contingent fee basis, or on the basis of some hybrid arrangement.[143] It is likely that most operating company litigation is on an hourly attorney fee basis and much NPE work is done on a contingent fee basis.[144] We believe that substantially all of the legal work done on behalf of defendants is on an

139. Lemley & Melamed, *supra* note 1, at 2165 (making this point).

140. *See* Allison, Lemley & Walker, *supra* note 9.

141. *See, e.g.*, Colleen V. Chien & Mark A. Lemley, *Patent Holdup, the ITC, and the Public Interest*, 98 CORNELL L. REV. 1, 10 fig.1 (2012). There is some evidence that litigants can predict the cases that courts will deny requests for injunctions, and therefore voluntarily choose not to pursue the equitable remedy. *See* Kirti Gupta & Jay P. Kesan, Studying the Impact of *eBay* on Injunctive Relief in Patent Cases (July 10, 2015) (unpublished manuscript), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2629399.

142. *Compare* Allison et al., *supra* note 9, at 694 (2011) (finding that, of the most litigated patents, the NPE settlement rate was not statistically different from the non–NPE settlement rate), *with* Risch, *supra* note 9, at 69 (2015) (finding that the most litigious NPEs have a higher settlement rate than a matched set of once–litigated patents). Notably, both of these studies oversampled repeat litigants (the focus of those studies) and therefore are not strictly representative of the population as a whole. However, they provide some information on what happened when the same patent was litigated multiple times.

143. Schwartz, *supra* note 22, at 344, 371–77.

144. *Id.*

hourly basis or modified hourly basis.[145] There is not yet a robust insurance market for patent infringement claims, so most companies bear their own legal defense costs. Contingent fee representation may affect the types of cases that go to judgment, especially when the defense work is done on an hourly basis.[146] Again, however, it is hard to tell what that effect would be.[147] In theory, contingent fee lawyers may be more likely to seek early settlement, which generates revenue for them with minimal work, while in theory hourly billing lawyers may be more willing to continue to litigate regardless of the merits or benefits to the client, as that approach generates extra revenue for the lawyers.[148] And the asymmetry between plaintiffs' and defendants' early–stage litigation costs may encourage the bottom–feeder litigation model. These factors certainly have an effect on which cases are selected for final judgment.

For each of these selection concerns, it is difficult to answer the policy–relevant questions about NPEs. Our results may be understated, in which case NPEs perform much worse in litigation than operating companies. If NPEs perform much worse in litigation, Congress should take note. Alternatively, our results may be overstated compared to the whole population of litigated cases. While we have personal prior beliefs about the plausibility of these potential selection mechanisms, empirical data on them is largely lacking. We believe that further investigation into the truth, as well as frequency and magnitude, of each of these mechanisms is warranted.

In a first effort at assessing the magnitude and direction of possible selection effects, we compared the technologies, industries, and entity types present in our data set with those for a small random sample of "unadjudicated" patents involved in lawsuits filed in 2008 and 2009, that is, patents in lawsuits that were filed during the same two–year period as those

145. *Id.*

146. Contingent fee representation reduces the plaintiff's upfront transaction costs (fees and often expenses) relative to the amount in dispute and relative to the upfront expense the defendant must incur. Settlement strategy is based on a combination of the perceived merits of the case (validity and infringement), damages, and the cost of defense.

147. We might expect plaintiffs represented by contingent–fee lawyers to bring more (and weaker) cases than other plaintiffs. Or, because the contingent–fee lawyers screen cases before accepting to handle them on a contingent basis, the lawsuits they bring may be stronger than other plaintiffs' lawsuits—or at least more likely to result in a payment in settlement, which is not necessarily the same thing. Plaintiffs represented on a contingent–fee basis may be more likely to settle those cases.

148. In theory neither should be a risk because of the ethical obligations of attorneys to zealously represent their clients. But that doesn't mean it never happens.

cases in our data set but did not reach a merits decision.[149] Tables 12, 13, and 14 below compare on the basis of technology, industry, and entity type, respectively.

The columns in these tables require some interpretation before being compared with each other. The second and third columns from the left provide the percentage of asserted utility patents, both in our merits data set and in the random sample of filed cases. The two columns on the far right collapse the patent–level information into a case–level observation. While the patent–case and case bases differ, a comparison is useful to see basic trends.

First, as we reported in a previous paper,[150] fewer than 10% of the patent lawsuits filed in 2008 and 2009 (462 of 5,029) resulted in any merits decision. In other words, more than 90% of lawsuits settled or were disposed of on nonsubstantive grounds before the court resolved summary judgment or tried the case.

**Table 10: 2008–2009 Filings vs. Adjudications by Technology[151]**

| Technology | % Adjudicated Patents | % Filed But Unadjudicated Patents | % Adjudicated Lawsuits | % Filed But Unadjudicated Lawsuits[152] |
|---|---|---|---|---|

149. We randomly sampled lawsuits filed in 2008 and 2009 (separately). We stratified the lawsuits to separate seven busy judicial districts (C.D. Cal., S.D.N.Y., N.D. Cal., N.D. Ill., E.D. Tex., D. Del., D.N.J.) and an omnibus "other" category. We randomly sampled from within these eight strata for each year. The busy judicial districts accounted for approximately 50% of filings in both years (48.2% in 2008, and 51.1% in 2009). We dropped design patents, as well as patents that were already in our dataset of adjudicated patents. Allison coded the technology and industry of the 210 patents that were at issue in the random draw of lawsuits. Schwartz coded the entity status of these patents. The sample includes 102 cases. We recognize that this is a relatively small random sample, but we believe it is important to attempt to evaluate potential selection concerns.

150. Allison, Lemley & Walker, *supra* note 8, at 5.

151. In Tables 10, 11, and 12, we report percentages with the number of observations in parenthesis in each cell.

152. For purposes of Tables 10, 11, and 12, we collapsed our dataset using patent–lawsuit as the unit of observation to a dataset using the lawsuit as the unit of observation. In some lawsuits, the asserted patents were in different industries and/or technologies. When we collapsed the dataset, we weighted the industries and/or technologies in these split lawsuits. For instance, if a lawsuit involved two patents, one in the mechanical technology and the other in the chemistry technology, we classified the lawsuit as 50% mechanical and 50% chemistry. Some cases involved as many as seven patents. As a result, some of the n's reported in parentheses are not integers. The unadjudicated sample included 102 cases so the n's and percentages are similar but not exactly the same. Because of rounding, the sums of the percentages do not always equal exactly 100%.

| | | | | |
|---|---|---|---|---|
| **Mechanical** | 28.7% (271) | 29.2% (61) | 29.5% (137) | 34.2% (34.5) |
| **Electrical** | 11.0% (104) | 11.0% (23) | 10.3% (48) | 9.4% (9.5) |
| **Chemistry** | 16.3% (154) | 20.0% (42) | 16.4% (76) | 22.8% (23) |
| **Biotech** | 5.3% (50) | 4.3% (9) | 4.1% (19) | 2.9% (3) |
| **Software** | 34.8% (329) | 32.5% (68) | 34.9% (162) | 25.7% (25.9) |
| **Optics** | 3.9% (37) | 2.9% (6) | 4.7% (22) | 4.9% (5) |

We used Fisher's Exact test to compare the distribution of proportions among technology areas for Adjudicated Patents with the same distribution for Filed–But–Unadjudicated Patents. The difference in the two distributions was not statistically significant; indeed, the distributions were almost identical (p=0.986).[153]

**Table 11: 2008–2009 Filings v. Adjudications by Industry**

| Industry | % Adjudicated Patents | % Filed But Unadjudicated Patents | % Adjudicated Lawsuits | % Filed But Unadjudicated Lawsuits |
|---|---|---|---|---|
| **Computer & Other Electronics** | 13.7% (129) | 17.1% (36) | 14.8% (68.7) | 12.7% (12.9) |
| **Semiconductor** | 3.1% (29) | 9.0% (19) | 1.8% (8.3) | 4.7% (4.8) |
| **Pharmaceuticals** | 11.6% (110) | 10.5% (22) | 12.1% (56) | 12.7% (13) |
| **Medical Devices** | 10.5% (99) | 4.3% (9) | 9.6% (44.3) | 8.1% (8.3) |
| **Biotech** | 3.2% (30) | 2.4% (5) | 2.3% (107) | 1.0% (1) |
| **Communications** | 13.0% (123) | 8.6% (18) | 10.3% (48) | 7.9% (8.1) |
| **Transportation** | 4.6% (43) | 5.2% (11) | 5.5% (253) | 5.1% (5.3) |
| **Construction** | 3.4% (32) | 3.3% (7) | 3.9% (18) | 5.0% (5.1) |
| **Energy** | 2.2% (21) | 5.7% (12) | 1.1% (15) | 5.1% (5.2) |
| **Consumer Products** | 14.2% (134) | 12.4% (26) | 18.1% (83.9) | 13.2% (13.5) |
| **Industry Goods** | 20.6% (195) | 20.5% (43) | 20.6% (95.8) | 23.2% (23.7) |

Fisher's Exact test again showed no statistically significant difference between the distribution of proportions among industry categories for

153. To be sure, if the selection largely occurs within technology, industry, or entity type then Tables 11 and 12 does little to exclude that selection is driving our results. Ideally, we would like some measure that the adjudicated patents are of similar quality to the unadjudicated patents. We lack such a measure for our data.

Adjudicated Patents and the distribution for Filed–But–Unadjudicated Patents.

**Table 12: 2008–2009 Filings vs. Adjudications by Entity Type**

| Entity Type | % Adjudicated Patents | % Filed But Unadjudicated Patents | % Adjudicated Lawsuits | % Filed But Unadjudicated Lawsuits |
|---|---|---|---|---|
| **Patent Holding Company** | 11.0% (104) | 11.4% (24) | 12.3% (57) | 12.7% (13) |
| **Indiv. Inventor** | 11.7% (111) | 8.1% (17) | 14.9% (69) | 10.3% (10.5) |
| **Operating Co.** | 72.1% (681) | 73.8% (155) | 66.8% (310) | 72.1% (73.5) |
| **PAE (broad definition)** | 27.9% (264) | 25.7% (54) | 33.2% (154) | 27.0% (27.5) |

Again, Fisher's Exact test revealed no statistical significance between the distribution of proportions among entity types for Adjudicated Patents and the distribution of proportions among entity types for Filed–But–Unadjudicated Patents.

As shown in Table 10, we note some relative balance between adjudicated and filed patents and lawsuits based on technology with a few notable exceptions. This may give us some comfort that selection effects are not the primary driving force in our results. Software *lawsuits* appear to be far overrepresented in definitive rulings (34.8% of the lawsuits in our dataset compared to 25.9% of filed cases), suggesting that a greater percentage of software cases go to judgment than other types of cases. On the other hand, the difference in the number of software *patents* asserted and adjudicated is far less pronounced, and we are not sure why. Both chemistry patents and lawsuits are somewhat underrepresented in our data set, suggesting that chemistry patents are less likely than others to go to judgment. With respect to industry, as shown in Table 11, medical device patents were substantially more likely to be in our adjudicated data set than the unadjudicated sample, although most of the differences disappear when analyzing the data on a case–level. The communications industry was also more likely to have definitive rulings, likely because so many of the patents litigated in the communications industry cover software technology. Semiconductor patents were less likely to appear in our data set than in the sample of filed–but–unadjudicated cases.

With respect to entity type, as shown in Table 12, patent holding companies appear to be relatively balanced in terms of patents and lawsuits.

Individual inventors are overrepresented in our dataset relative to the filed cases.[154] NPEs, using a broad definition, are overrepresented on a lawsuit basis, but only slightly on a per–patent basis. We do not have a clear explanation for the differences between the per–patent basis and the per–lawsuit basis. As with industry and technology, we are somewhat comforted by the absence of dramatic selection differences between the two data sets, which may help to ameliorate some of the concerns discussed in this Section. However, even comparing filed–but–unadjudicated cases by industry, technology, and entity type with the adjudicated cases in our data set cannot capture selection affecting who decides to initially file a lawsuit. It is, of course, still possible that we are observing similar percentages while other unobservable metrics relating to case quality vary.

### B. IMPLICATIONS FOR PATENT REFORM AND PATENT DEBATES

In this Section, we put aside the concerns that we just discussed—that operating companies and NPEs differentially settle cases in a way that might skew our results based upon decided cases. We make the simplifying assumption that our dataset is sufficiently representative of all patent disputes, even those that settle.[155] With this assumption, we now discuss the implications that flow from our results.

In terms of merits rulings, we find that operating companies fare better than PAEs and individual inventors. Interestingly, in merits rulings, PAEs do most poorly when they are *not* asserting software patents, winning only 5.3% of their non–software cases that reach judgment. We cannot explain *why* PAEs lose so often. It might be that they assert weaker patents,[156] but it could also be that judges are biased against them for policy reasons,[157] that their attorneys are less skillful, or that the NPE cases that reach

154. Our random sample of unadjudicated cases only contained two university patent holders. Given the extremely small number, we do not calculate values for universities.

155. That assumption finds support in some recent work suggesting that selection effects do not play a significant role in determining which cases settle. *See* Eric Helland et al., *Maybe There's No Bias in the Selection of Disputes for Litigation*, J. INST. & THEORETICAL ECON. (forthcoming 2017), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2994624.

156. There is some evidence that PAEs select patents granted by particular examiners who allow patents on minor improvements that nonetheless have vague and broadly-worded claims. Josh Feng & Xavier Jaravel, Who Feeds the Trolls? Patent Trolls and the Patent Examination Process (July 11, 2016) (unpublished manuscript), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2838017.

157. At least one contingent–fee attorney believes that judges are biased against NPEs. Schwartz, *supra* note 22, at 378 n.205 (recounting that one contingent–fee lawyer stated that "[s]ome judges have great antipathy toward patent speculators").

adjudication are worse for some other reason (such as those described in Section IV.A) than the cases that NPEs settle.

We also find that some, but not all, of operating companies' relative success derives from ANDA pharmaceutical cases, where patentees succeed much more often than they do in any other field. Software patents, by contrast, have a lower success rate. The relationship between entity status, software, and the other variables in our study is a complicated one. And while all types of NPEs disproportionately asserted software patents, they did not do measurably worse in software cases than operating companies did. Rather, the win rate was low across the board for software patents.

If our results are representative of all patent litigation, we believe that they have useful implications for continuing policy debates about the patent system generally and patent reform particularly. With this assumption, we offer three implications below.

First, our data suggest that NPEs are far from monolithic. Some of the authors have previously argued that we should be less focused on trying to identify patent "trolls."[158] Even for those who do wish to focus attention on them as the source of a problem, it is clear that treating all NPEs alike is a mistake. It makes a big difference in merits decisions in litigation whether the party in question is a PAE, an individual, a failed startup, or a university. And while we cannot prove that the difference extends beyond litigation outcomes, it probably makes sense to start talking about the different types of NPEs such as universities, individual inventors, and failed startups differently than PAEs, whose business model is to merely acquire patents for the purpose of assertion. This is not to deny that even the narrower category of PAEs is worthy of debate for its role in the patent system. PAEs and individual plaintiffs adjudicated by far the most suits of any NPE classes, and they did the least well. But everyone in this debate should be more precise than we often are when talking about patent litigants.

Second, our data help to emphasize the significant differences across technologies and industries in how they experience the patent litigation system.[159] Pharmaceutical patents in ANDA litigation fare far better in final judgments than patents in any other industry or type of litigation—and not one of them was brought by an NPE of any type. Software patents do worse

158. Lemley & Melamed, *supra* note 1, at 2170; Mark A. Lemley, *Are Universities Patent Trolls?*, 18 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 611, 630 (2008); Schwartz & Kesan, *supra* note 13.

159. For discussion of this issue, see, e.g., BURK & LEMLEY, *supra* note 31.

than those in most other technology fields.[160] And unlike operating companies, a majority of the suits litigated to judgment by every type of NPE involved software patents. While the outcome data don't suggest that NPE software patents performed more poorly in litigation than did operating company software patents, they nonetheless tell a story of two very different poles in the patent litigation system. Outcomes in ANDA pharmaceutical patent cases and software patent cases look virtually nothing alike, from who wins to where they are adjudicated to the kind of entity that brings the lawsuits. ANDA cases also differ procedurally, with an automatic "30-month stay" which is equivalent to a preliminary injunction. Most ANDA cases are heard by a judge instead of a jury, and the courts hearing bench trials often do not permit summary judgment motions.[161] Industry differences matter both because differences between industries have influenced the success and scope of patent reform[162] and because there is some evidence suggesting that certain industries need the patent system more than others.[163]

Finally, our data highlight the extent to which patent litigation in the United States has separated not only along entity, technology, and industry lines, but also along geographic ones. NPEs other than universities overwhelmingly flock to the Eastern District of Texas, and for good reason: even considering the lower win rate of PAEs and individuals, plaintiffs that take their cases to decision do much better in that district than anywhere else.[164] By contrast, operating companies file suit in a variety of jurisdictions, and their favorite—the District of Delaware—is no more likely to rule for patentees than average in cases that reach judgment. We have a specialized patent trial court in the United States. It is located in Marshall, Texas, and it specializes not just in patent trials but is also receptive to NPE patent litigation. A large portion of NPE patent litigation outcomes at the ground level were made in the Eastern District of Texas. Reasonable people can differ on whether that is good or bad for the world.[165]

160. Allison et al., *supra* note 27, at 1099.

161. *Id.*

162. BURK & LEMLEY, *supra* note 31.

163. JAMES BESSEN & MICHAEL J. MEURER, PATENT FAILURE: HOW JUDGES, BUREAUCRATS, AND LAWYERS PUT INNOVATORS AT RISK (2008).

164. Fabio E. Marino & Teri H.P. Nguyen, *Has Delaware Become the "New" Eastern District of Texas? The Unforeseen Consequences of the AIA*, 30 SANTA CLARA HIGH TECH. L.J. 527, 529–30 (2014) ("Recent survey data on new patent suit filings suggests that NPEs have found a new 'forum of choice' in the District of Delaware . . . .").

165. *See, e.g.*, Jeff Becker, *On Creating Specialized Patent District Courts: Why H.R. 34 Does Not Go Far Enough to Address Reversal Rates in District Courts*, 61 SMU L.

The Supreme Court in *TC Heartland v. Kraft Food Group* recently narrowed the range of potential venues in patent infringement lawsuits.[166] It would be worthwhile to study litigation outcomes after the full effects of *TC Heartland* are apparent.

Our results may also have implications for specific legislative proposals. For example, Congress is considering expanding fee shifting to prevailing parties.[167] The primary justification for enhanced fee shifting is that accused infringers feel economic pressure to settle weak lawsuits because the settlement demands are substantially below the cost of defense. Fee shifting would encourage these defendants to press with litigation instead of settling, which (in theory) would discourage patent holders from bringing weak cases. To evaluate the effects of fee shifting based on this rationale, one would need to include the unadjudicated cases that we lack.

Our results may be more useful to understand what would happen if we shifted fees in cases without warning and without an opportunity for the parties to settle based upon the change. As we have previously written,[168] the win rate may be driven, in part, by general civil litigation dynamics: defendants have several opportunities for a final judgment in their favor. Defendants can win on summary judgment or trial or appeal, while a patentee must run the table to prevail. But whatever the reason, some may believe that fee shifting in these cases is desirable, and we believe that fee shifting would alter the proportion of litigated and settled cases.

If we shifted fees in *all* the 2008 and 2009 merits decisions, then NPEs would be responsible for fees in 85% of the definitive rulings, and patent owners across the board would be responsible for fees in about 75% of the non–ANDA cases. But no proposal in Congress would go that far. Even if it were not applied to every case, an even–handed fee–shifting rule would probably tend to shift fees to defendants significantly more often than to patent owners; thus causing PAEs to pay fees more often than operating companies (assuming that the selection concerns aren't driving our results). That is true not only because defendants win most adjudicated cases, particularly against PAEs, but because defendants are much more likely to

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REV. 1607 (2008); Rochelle Cooper Dreyfuss, *The Federal Circuit As an Institution: What Ought We to Expect?*, 43 LOY. L.A. L. REV. 827 (2010); Jeanne C. Fromer, *Patentography*, 85 N.Y.U. L. REV. 1444 (2010); Paul R. Gugliuzza, *Patent Law Federalism*, 2014 WIS. L. REV. 11 (2014); Daniel Klerman & Greg Reilly, *Forum Selling*, 89 S. CAL. L. REV. 241 (2016); Arti K. Rai, *Specialized Trial Courts: Concentrating Expertise on Fact*, 17 BERKELEY TECH. L.J. 877 (2002).

166. TC Heartland LLC v. Kraft Food Grp. Brands, LLC , 137 S. Ct. 1514 (2017).

167. Innovation Act, H.R. 9, 114th Cong. (2015).

168. Allison, Lemley & Schwartz, *supra* note 8, at 1789–90; Lemley, *supra* note 106.

win pre–trial while patentees more often win at trial, and courts are likely to be reluctant to shift fees in a close case in which neither side could prevail on summary judgment. Of course, the policy debate surrounding fee shifting is complex, as it increases the potential exposure of both plaintiffs and defendants and further advantages larger and financially powerful parties over smaller ones.

## V. CONCLUSION

The debate over patent trolls has occupied policy makers in the patent system for the last several years. In this Article, we offer a comprehensive look at one important piece of evidence in that debate—how different types of patent plaintiffs fare in court. We find significant differences by technology, industry, court, and entity type in whether and how patentees win their cases. While our data doesn't resolve the policy debates, it brings real–world evidence to bear on a discussion that is too often based on supposition.

## VI. APPENDIX

**Table A1: Entire Population of 2008–2009 Adjudicated Patents Operating Company vs. NPE Subtypes**

| | Frequency | Percent |
|---|---|---|
| **Operating Co.** | 681 | 72.1% |
| **Univ.** | 13 | 1.4% |
| **Indiv.** | 111 | 11.8% |
| **Failed Startup** | 36 | 3.8% |
| **PAE** | 104 | 11.0% |
| **Total** | 945 | 100.0%[169] |

169. In the tables reported in the Appendix, some of the percentage totals do not add to exactly 100.0% due to rounding.

**Table A2: Proportions Among Districts by Entity Type Compared with Overall District Proportions—Operating Companies vs. NPE**

| Top Row = Frequency; Bottom Row = Percentage | Operating Co. | NPE | Total | Comparison of Proportions (Fisher's Exact test) p–value |
|---|---|---|---|---|
| **TX ED** | 56 | 71 | 127 | |
| | 8.2% | 26.9% | | <0.001*** |
| **D ED** | 101 | 21 | 122 | |
| | 14.8% | 8.0% | | 0.005** |
| **CA ND** | 64 | 17 | 81 | |
| | 9.4% | 6.4% | | 0.156 |
| **CA CD** | 32 | 24 | 56 | |
| | 4.7% | 9.1% | 1 | 0.014* |
| **CA SD** | 38 | 13 | 51 | |
| | 5.6% | 4.9% | | 0.751 |
| **NY SD** | 42 | 5 | 47 | |
| | 6.2% | 1.9% | | 0.007*** |
| **IL ND** | 17 | 23 | 40 | |
| | 2.5% | 8.7% | | <0.001*** |
| **WI WD** | 25 | 3 | 28 | |
| | 3.7% | 1.1% | | 0.052 |
| **NJ D** | 29 | 5 | 34 | |
| | 4.3% | 1.9% | | 0.117 |
| **MA D** | 24 | 3 | 27 | |
| | 3.5% | 1.1% | | 0.051 |
| **VA ED** | 24 | 6 | 30 | |
| | 3.5% | 2.3% | | 0.411 |
| **OH ND** | 10 | 7 | 17 | |
| | 1.5% | 2.7% | | 0.273 |
| **TX SD** | 20 | 2 | 22 | |
| | 2.9% | 0.8% | | 0.053 |
| **All Other Dist.** | 199 | 64 | 263 | |
| | 29.2% | 24.2% | | 0.145 |

**Table A3: Proportions Among Districts by Entity Type Compared with Overall District Proportions—Operating Companies vs. NPE Subtypes**

| Top Row = Frequency Bottom Row = Percentage | Operating Co. | Univ. | Indiv. | Failed Startup | PAE | Total |
|---|---|---|---|---|---|---|
| **TX ED** | 56 | 1 | 29 | 14 | 27 | 127 |
| | 8.2% | 7.7% | 26.1%** | 38.9%** | 26.0%** | |
| **D ED** | 101 | 0 | 2 | 5 | 14 | 122 |
| | 14.8% | 0.0% | 1.8%** | 13.9% | 13.5% | |
| **CA ND** | 64 | 1 | 3 | 1 | 12 | 81 |
| | 9.4% | 7.7% | 2.7%* | 2.8% | 11.5% | |
| **CA CD** | 32 | 0 | 11 | 2 | 11 | 56 |
| | 4.7% | 0.0% | 9.9%* | 5.6% | 10.6%* | |
| **CA SD** | 38 | 0 | 9 | 2 | 2 | 51 |
| | 5.6% | 0.0% | 8.1% | 5.6% | 1.9% | |
| **NY SD** | 42 | 0 | 3 | 2 | 0 | 47 |
| | 6.2% | 0.0% | 2.7% | 5.6%** | 0.0%** | |
| **IL ND** | 17 | 0 | 12 | 0 | 11 | 40 |
| | 2.5% | 0.0% | 10.8%** | 0.0% | 10.6%** | |
| **WI WD** | 25 | 1 | 0 | 0 | 2 | 28 |
| | 3.7% | 7.7% | 0.0%* | 0.0% | 1.9% | |
| **NJ D** | 29 | 0 | 5 | 0 | 0 | 34 |
| | 4.3% | 0.0% | 4.5% | 0.0% | 0.0%* | |
| **MA D** | 24 | 1 | 2 | 0 | 0 | 27 |
| | 3.5% | 7.7% | 1.8% | 0.0% | 0.0% | |
| **VA ED** | 24 | 0 | 1 | 1 | 4 | 30 |
| | 3.5% | 0.0% | 0.9% | 2.8% | 3.8% | |
| **OH ND** | 10 | 0 | 0 | 0 | 7 | 17 |
| | 1.5% | 0.0% | 0.0% | 0.0% | 6.7%** | |
| **TX SD** | 20 | 0 | 1 | 0 | 1 | 22 |
| | 2.9% | 0.0% | 0.9% | 0.0% | 1.0% | |
| **All Other Dist.** | 199 | 9 | 33 | 9 | 13 | 263 |
| | 29.2% | 69.2%** | 29.7% | 25.0% | 12.5%** | |

**Table A4: Observations by Primary Technology—Operating Company vs. NPE**

| Top Row = Frequency; Bottom Row = Percentage | Operating Co. | NPE | Total | Comparison of Proportions (Fisher's Exact test) p–value |
|---|---|---|---|---|
| **Mechanical** | 235 | 36 | 271 | |
| | 34.50% | 13.60% | | <0.001*** |
| **Electrical** | 77 | 27 | 104 | |
| | 11.30% | 10.20% | | 0.728 |
| **Chemistry** | 149 | 5 | 154 | |
| | 21.90% | 1.90% | | <0.001*** |
| **Biotechnology** | 41 | 9 | 50 | |
| | 6.00% | 3.40% | | 0.144 |
| **Software—All** | 155 | 174 | 329 | |
| | 22.80% | 65.90% | | <0.001*** |
| **Software—BusMeth** | 36 | 29 | 65 | |
| | 5.30% | 11.00% | | 0.004*** |
| **Software-NonBusMeth** | 119 | 145 | 264 | |
| | 17.50% | 54.90% | | <0.001*** |
| **Optics** | 24 | 13 | 37 | |
| | 3.50% | 4.90% | | 0.35 |
| **Total** | 836 | 438 | 1274 | |

**Table A5: Observations by Primary Technology—Operating Company vs. NPE Subtypes**

| Top Row = Frequency; Bottom Row = Percentage | Operating Co. | Univ. | Indiv. | Failed Startup | PAE | Total |
|---|---|---|---|---|---|---|
| **Mechanical** | 235 | 0 | 29 | 2 | 5 | 271 |
| | 34.5% | 0.0%** | 26.1% | 5.6%** | 4.8%** | |
| **Electrical** | 77 | 2 | 10 | 8 | 7 | 104 |
| | 11.3% | 15.4% | 9.0% | 22.2% | 6.7% | |
| **Chemistry** | 149 | 0 | 2 | 3 | 0 | 154 |
| | 21.9% | 0.0%** | 1.8% | 8.3% | 0.0%** | |
| **Biotech.** | 41 | 2 | 0 | 0 | 7 | 50 |
| | 6.0% | 15.4%** | 0.0% | 0.0% | 6.7% | |
| **Software-All** | 155 | 9 | 62 | 23 | 80 | 329 |
| | 22.8% | 69.2%** | 55.9%** | 63.9%** | 76.9%** | |
| **Software—BusMeth** | 36 | 0 | 8 | 12 | 9 | 65 |
| | 5.3% | 0.0% | 7.2% | 33.3%** | 8.7% | |
| **Software—NonBusMeth** | 119 | 9 | 54 | 11 | 71 | 264 |
| | 17.5% | 69.2%** | 48.6%** | 30.6%** | 68.3%** | |
| **Optics** | 24 | 0 | 8 | 0 | 5 | 37 |
| | 3.5% | 0.0% | 7.2% | 0.0% | 4.8% | |
| **Total** | 836 | 22 | 173 | 59 | 184 | 1274 |

**Table A6: Litigation Outcomes—Operating Companies vs. NPE**

| **Top Row = Frequency; Bottom Row = Percentage** | **Operating Co.** | **NPE** | **Total** | **Comparison of Proportions (Fisher's Exact test) p–value** |
|---|---|---|---|---|
| **Invalid.—All Grounds—Any stage**[170] | 135 | 53 | 188 | |
| | 40.9% | 48.2% | | 0.184 |
| **Invalid.—102 Prior Art—Any Stage** | 47 | 24 | 71 | |
| | 27.3% | 42.1% | | 0.047* |
| **Invalid. — Obvious.**[171]**— Any Stage** | 55 | 16 | 71 | |
| | 27.4% | 42.1% | | 0.082 |
| **Invalid.—Claim Indefiniteness— Any Stage** | 12 | 19 | 31 | |
| | 10.5% | 31.7% | | 0.001*** |
| **Invalid.— Written Descr. —Any Stage** | 16 | 3 | 19 | |
| | 19.5% | 17.6% | | 1.000 |
| **Invalid.— Enablement— Any Stage** | 12 | 7 | 19 | |
| | 11.9% | 70.0% | | <0.001*** |
| **Invalid.— Inadequate Disclosure (Written Descr. & Enablement Comb.)—Any Stage** | 18 | 9 | 27 | |
| | 12.1% | 45.0% | | 0.005** |
| **Literal Infring. —Any Stage** | 157 | 31 | 188 | |
| | 41.8% | 19.3% | | <0.001*** |

170. The totals for Invalidity—All Grounds is not merely the sum of the individual bases for invalidity. Many patents were alleged to be invalid for multiple reasons.

171. Obviousness.

| | | | | |
|---|---|---|---|---|
| **Total Direct Infring.—Any Stage** | 160 | 37 | 197 | |
| | 42.4% | 22.4% | | <0.001*** |
| **Inducement Infring.—Any Stage** | 31 | 6 | 37 | |
| | 44.9% | 25.0% | | 0.097 |
| **Contributory Infring.—Any Stage** | 21 | 8 | 29 | |
| | 46.7% | 33.3% | | 0.317 |

**Table A7: Litigation Outcomes—Operating Companies vs. NPE Subtypes**

| **Top Row = Frequency; Bottom Row = Percentage** | **Operating Co.** | **Univ.** | **Indiv.** | **Failed Startup** | **PAE** | **Total** |
|---|---|---|---|---|---|---|
| **Invalid.—All Grounds—Any Stage** | 135 | 0 | 33 | 6 | 14 | 188 |
| | 40.9% | 0.0% | 56.8%* | 40.0% | 42.4% | |
| **Invalid.—102 Prior Art—Any Stage** | 47 | 0 | 17 | 3 | 4 | 71 |
| | 27.3% | 0.0% | 54.8%** | 23.1% | 40.0% | |
| **Invalid.—Obvious.—Any Stage** | 55 | 0 | 12 | 1 | 3 | 71 |
| | 27.4% | 0.0% | 60.0%** | 14.3% | 37.5% | |
| **Invalid.—Claim Indefiniteness—Any Stage** | 12 | 0 | 8 | 1 | 10 | 31 |
| | 10.5% | 0.0% | 27.6%* | 33.3% | 38.5%** | |
| **Invalid.—Written Descr.—Any Stage** | 16 | 0 | 2 | 1 | 0 | 19 |
| | 19.5% | 0.0% | 25.0% | 33.3% | 0.0% | |
| **Invalid.—Enablement—Any Stage** | 12 | 0 | 6 | 1 | 0 | 38 |
| | 11.9% | 0.0% | 75.0%** | 100.0% | 0.0% | |
| **Invalid.—Inadequate Disclosure (Written Descr. & Enablement Comb.)—Any Stage** | 18 | 0 | 7 | 2 | 0 | 54 |
| | 12.1% | 0.0% | 70.0%** | 66.7% | 0.0% | |
| **Literal Infring.—Any Stage** | 157 | 3 | 10 | 6 | 12 | 188 |
| | 41.8% | 33.3% | 19.6%** | 25.0% | 15.6%** | |
| **Total Direct Infring.—Any Stage** | 160 | 3 | 16 | 6 | 12 | 197 |
| | 42.4% | 30.0% | 29.6% | 25.0% | 15.6% | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Inducement Infring.—Any Stage** | 31 | 2 | 1 | 0 | 3 | 37 |
| | 44.9% | 100.0% | 20.0% | 0.0% | 21.4% | |
| **Contributory Infring.—Any Stage** | 21 | 2 | 3 | 0 | 3 | 29 |
| | 46.7% | 100.0% | 100.0% | 0.0% | 21.4% | |

**Table A8: Logistic Regression on Outcomes—Operating Companies v. NPE—Controlling for Primary Technology Areas, Three Busiest Districts, and Patent & Litigation Characteristics**

| Top Row = Logit Coefficient; Bottom Row = Std. Error | Patent Owner Definitive Win | SJ Invalid. —All Grounds— Any Stage | SJ Non— infring. | Non– infring.: SJ + Stip. Jgmt | Patent Owner Trial Winner |
|---|---|---|---|---|---|
| **Operating Co. Compared with NPEs** | -0.918* | 0.631 | 0.828* | 0.890* | -0.380 |
| | (0.450) | (0.488) | (0.383) | (0.442) | (0.664) |
| **Declaratory Judgment Control** | x | x | x | x | x |
| | | | | | |
| **Patent Demographic Controls**[172] | x | x | x | x | x |
| | | | | | |
| **Litigation Demographic Controls**[173] | x | x | x | x | x |
| **ANDA Case Control** | x | x | x | x | x |
| **TX ED** | 1.370** | -1.106* | -0.815* | -0.752* | 0.392 |
| | -0.368 | -0.475 | -0.32 | -0.375 | -0.522 |
| **D DE** | -0.0686 | -0.421 | 0.325 | 0.314 | -0.806* |
| | -0.299 | -0.568 | -0.32 | -0.306 | -0.355 |
| **CA ND** | 0.0646 | 0.655 | 0.411 | 0.406 | -0.681 |
| | -0.366 | -0.393 | -0.42 | -0.413 | -0.73 |
| **Comparison dummy for 3 districts is all other districts** | | | | | |
| **Technology Controls** | | | | | |
| **Interaction (Broad_NPE & Software)** | 0.114 | 0.133 | -0.072 | -0.103 | 0.147 |

172. Patent demographic controls include adjusted number of forward citations, foreign origin of invention, total prior art reference, and age of patent at litigation filing.

173. Litigation demographic controls include age of patent at litigation filing, number of accused infringers, number of asserted patents, and number of lawsuits on patent through Dec. 31, 2009.

| | | | | | |
|---|---|---|---|---|---|
| | -0.117 | -0.236 | -0.105 | -0.13 | -0.671 |
| **F–test For Joint Technology Effects** | 29.48** | 0.57 | 3.06 | 2.31 | 5.83 |
| | | | | | |
| **Observations** | 632 | 407 | 471 | 506 | 288 |

**Table A8 (Continued)**

| **Top Row = Coefficient; Bottom Row = Std. Error** | **Invalid. —All Grounds —Any Stage** | **Invalid. Sec. 102 Prior Art–Any Stage** | **Invalid. Obvious. —Any Stage** | **Invalid. Indef.— Any Stage** | **Literal Infring. —Any Stage** | **Total Direct Infring . Any Stage** |
|---|---|---|---|---|---|---|
| **Operating Co. Compared with NPEs** | -1.204** | -1.803** | -0.756 | -1.490 | 0.820** | 0.364 |
| | -0.554 | -0.856 | -0.598 | -10.236 | -0.364 | -0.367 |
| **Declaratory Judgment Control** | x | x | x | x | x | x |
| **Patent Demographic Controls**[174] | x | x | x | x | x | x |
| **Litigation Demographic Controls**[175] | x | x | x | x | x | x |
| **ANDA Case Control** | x | x | x | x | x | x |
| **TX ED** | -1.415*** | -1.488** | -0.523 | -0.982 | 0.962*** | 0.918*** |
| | -0.388 | -1.267 | -1.123 | -0.975 | -0.356 | -0.374 |
| **DE D** | 0.249 | -0.216 | -0.097 | 1.939 | -0.219 | -0.0680 |
| | -0.345 | -0.747 | -0.52 | -1.676 | -0.313 | -0.295 |
| **CA ND** | 0.895** | 1.223 | 0.981 | 0.835 | -1.060* | -1.120** |
| | -0.436 | -0.844 | -0.703 | -0.866 | -0.474 | -0.583 |
| **Comparison dummy for 3 districts is all other districts** | | | | | | |
| **Technology Controls** | x | x | x | x | x | x |

174. Patent demographic controls include adjusted number of forward citations, foreign origin of invention, total prior art reference, and age of patent at litigation filing.

175. Litigation demographic controls include age of patent at litigation filing, number of accused infringers, number of asserted patents, and number of lawsuits on patent through Dec. 31, 2009.

| | | | | | | |
|---|---|---|---|---|---|---|
| **Interaction (NPEs & Software)** | -0.161 | -0.227 | -0.099 | 0.06 | 0.063 | 0.002 |
| | -0.296 | -0.837 | -1.296 | -0.692 | -0.17 | -0.113 |
| **F–Test For Joint Technology Effects** | 6.82 | 3.54 | 555.57*** | 1.54 | 13.09** | 17.54 *** |
| **Observations** | 440 | 229 | 239 | 127 | 537 | 542 |

With regard to row labeled "Interaction (Broad_NPE & Software," an interaction term captures *the effect of one independent variable on the effect of the other independent variable on the dependent variable*. Here, the interaction term measures whether the effect that a patent being in the primary software technology has on a particular outcome is itself affected by the additional fact of the patent owner being an NPE (using the broad NPE definition). All regression coefficients measure magnitude and direction of effect. We report our transformed interaction coefficient. An untransformed interaction coefficient in logistic regression reveals only part of the picture. Some researchers have erroneously interpreted the coefficient of an interaction in logistic regression by omitting the second–order term in the interaction effect. That is, they have assumed a linear relationship between the independent variables in the interaction which is being measured.[176] The relationship is not linear because the interaction term is also affected by the values of all other independent variables in the model. The interaction effect between the two independent variables (Software and Broad_NPE) is captured by[177]:

$$\frac{\partial^2 G(\cdot)}{\partial x_1 \partial x_2} = \beta_{12} G'(\cdot) + (\beta_2 + \beta_{12} x_2)(\beta_2 + \beta_{12} x_2)(\beta_2 + \beta_{12} x_1) G''(\cdot).$$

We transformed our coefficient and report the true interaction coefficient.

176. *See* Chunrong Ai & Edward C. Norton, *Interaction Terms in Logit and Probit Models*, 80 ECON. LETTERS 123 (2003).

177. *Id.*

**Table A9: Logistic Regression on Outcomes—NPE Subtypes with Operating Companies as the Comparison Dummy—Controlling for Primary Technology Areas, Three Busiest Districts, And Patent & Litigation Characteristics**

| Top Row = Coefficient; Bottom Row = Std. Error | Patent Owner Definitive Win | SJ Invalid.–All Grounds–Any Stage | SJ Non–infring. | SJ Non–infring. + Stip. Jgmt Non-infring. | Patent Owner Trial Winner |
|---|---|---|---|---|---|
| **Indiv.** | -0.559 | -0.060 | 0.921 | 1.185 | -0.752 |
| | (3.308) | (3.496) | (0.580) | (0.863) | (0.642) |
| **Failed Startup** | -0.980 | 1.113 | 0.791 | 0.665 | -0.529+ |
| | (6.697) | (4.277) | (4.541) | (0.716) | (0.320) |
| **Univ.** | -9.965*** | 0.000 | -0.744 | -0.791 | 0.000 |
| | (1.281) | (0.000) | (7.417) | (6.785) | (0.000) |
| **PAE** | -2.149 | 2.221 | 1.077 | 0.848 | 16.826* |
| | (4.320) | (4.066) | (2.724) | (1.173) | (7.835) |
| **Comparison dummy is operating company** | | | | | |
| **Declaratory Judgment control** | x | x | x | x | x |
| **Patent demographic controls** | x | x | x | x | x |
| **Litigation demographic controls** | x | x | x | x | x |
| **ANDA case control** | x | x | x | x | x |
| | | | | | |
| **TX ED** | 1.489*** | -1.289* | -0.796+ | -0.754+ | 0.420 |
| | (0.367) | (0.575) | (0.424) | (0.428) | (0.738) |
| **D DE** | -0.019 | -0.602 | 0.370 | 0.369 | -0.887* |
| | (0.267) | (0.625) | (0.409) | (0.425) | (0.372) |
| **CA ND** | 0.123 | 0.550 | 0.390 | 0.387 | -0.751 |
| | (0.394) | (0.474) | (0.347) | (0.379) | (0.606) |
| **Comparison dummy is all other districts** | | | | | |
| **Technology control** | x | x | x | x | x |
| **Interaction (Indiv. & Software)** | 0.005 | 0.296 | 0.004 | -0.067 | 0.067 |
| | (0.409) | (0.882) | 1.469) | (1.222) | 0.897) |

| | | | | | |
|---|---|---|---|---|---|
| **Interaction (Failed Startup & Software)** | 0.1ca20 | 0.122 | -0.357 | -0.339 | 0.248 |
| | (0.318) | (1.000) | (2.302) | (2.025) | (0.926) |
| **Interaction (Univ. & Software)** | 0.632 | 0.000 | 0.108 | 0.108 | 0.000 |
| | (1.358) | (0.000) | (2.172) | (1.766) | (0.000) |
| **Interaction (PAE & Software)** | 0.195 | -0.158 | -0.123 | -0.095 | -0.283 |
| | (0.554) | (0.704) | (1.808) | (1.432) | (2.684) |
| **Observations** | 632 | 400 | 471 | 506 | 285 |

**Table A9 (Continued)**

| **Top Row = Coefficient; Bottom Row = Std. Error** | **Invalid. —All Grounds —Any Stage** | **Invalid.- Sec. 102 Prior Art–Any Stage** | **Invalid.— Obvious. —Any Stage** | **Invalid. Indefinit. —Any Stage** | **Literal Infring. —Any Stage** | **Total Direct Infring.— Any Stage** |
|---|---|---|---|---|---|---|
| **Indiv.** | 0.775 | 1.428 | 0.957 | 0.290 | -0.993* | -0.251 |
| | (0.560) | (5.378) | (4.891) | (4.532) | (0.411) | (0.597) |
| **Failed Startup** | 14.755*** | 16.262*** | -0.653 | 2.104 | -0.850 | -0.867 |
| | (1.503) | (1.511) | (1.355) | (1.959) | (6.349) | (6.709) |
| **Univ.** | 0.000 | 0.000 | 0.000 | 0.000 | -13.326*** | -13.130*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (1.301) | (1.187) |
| **PAE** | 2.456 | 2.595 | -0.123 | 3.284 | -0.369 | -0.330 |
| | (6.157) | (5.286) | (16.704) | (14.055) | (0.779) | (0.775) |
| **Comparison dummy is operating company** | | | | | | |
| **Declaratory Judgment Control** | x | x | x | x | x | x |
| **Patent Demographic Controls** | x | x | x | x | x | x |
| **Litigation Demographic Controls** | x | x | x | x | x | x |
| **ANDA Case Control** | x | x | x | x | x | x |
| **TX ED** | -1.600*** | -1.474 | -0.588 | -1.441 | 1.056* | 0.987* |
| | (0.474) | (1.412) | (0.789) | (1.732) | (0.456) | (0.456) |
| **D DE** | 0.177 | -0.288 | -0.045 | 2.167 | -0.207 | -0.036 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | (0.334) | (0.512) | (0.260) | (1.850) | (0.373) | (0.300) |
| **CA ND** | 0.939** | 1.245 | 1.058 | 1.024 | -1.017* | -1.078* |
| | (0.314) | (0.752) | (0.549) | (1.062) | (0.472) | (0.504) |
| **Comparison dummy for 3 districts is all other districts** | | | | | | |
| **Technology Controls** | x | x | x | x | x | x |
| **Interaction (Indiv. & Software)** | 0.045 | -0.014 | -0.070 | 0.374 | 0.005 | -0.056 |
| | (0.346) | (0.544) | (1.516) | (1.842) | (0.393) | (0.298) |
| **Interaction (Failed Startup & Software)** | -0.545 | -0.676 | 0.049 | 0.066 | 0.063 | 0.062 |
| | (0.619) | (1.257) | (1.152) | (1.240) | (0.285) | (0.308) |
| **Interaction (Univ. & Software)** | 0.000 | 0.000 | 0.000 | 0.000 | 0.588 | 0.562 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.885) | (0.856) |
| **Interaction (PAE & Software)** | -0.498 | -0.387 | 0.034 | -0.262 | -0.041 | -0.049 |
| | (0.651) | (0.850) | (0.385) | (0.800) | (0.309) | (0.317) |
| **Observations** | 436 | 226 | 236 | 125 | 537 | 542 |