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David L. Schwartz[*] *& Xaviere Giroud*[**]

High-profile design-patent litigation between Apple and Samsung has made headlines in the last few years. Not surprisingly, thereafter, design patents and related litigation have risen exponentially and have become more important to the economy. Design patents provide legal protection for aesthetic and ornamental aspects of a manufactured product. While there is rich and longstanding empirical literature and a crucial understanding about many facets of utility-patent litigation, almost nothing is known about the design-patent litigation world. This Article fills that void. By building a novel and comprehensive database of all lawsuits alleging design-patent infringement from 2000 to 2016, this Article reports the results of a broad empirical exploration of design-patent litigation, while giving an overview of the design-patent-litigation process.

The study reveals that while utility- and design-patent litigation look similar at first glance, they are actually very different in several important respects. First, we find that unlike utility litigation, which almost always involves a large company, almost half of design-patent litigation involves small- or medium-sized companies as both plaintiffs and defendants. Second, the amount of design-patent litigation has continuously increased over the last decade, whereas utility-patent-infringement lawsuits sharply increased and then dipped over the same period. Third, design-patent plaintiffs tend to file cases in different districts than utility-patent plaintiffs. Namely, we find that design-patent asserters did not participate in the flood of litigation in the Eastern District of Texas. Finally, design-patent plaintiffs are almost all practicing entities who manufacture products rather than nonpracticing entities (so-called "trolls"). These empirical findings have important implications for the law of design patents. While the courts treat utility- and design-patent litigation as similar for many purposes, including understanding the doctrine and managing the docket, the actual litigation on the ground is starkly different.

INTRODUCTION

In the smartphone market, the industry giants have fought a ferocious battle for customers. Not only have they released back-to-back products vying for the highest sales,[1] but the battle also spilled over into the courts in the form of intellectual property disputes. *Apple Inc. v. Samsung Electronics, Co.*[2] flooded the media with a seven-year fight for smartphone supremacy. One news source described the conflict as "the late Steve Jobs' worst nightmare."[3] In 2011, Apple

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1. *See* Jack Linshi, *This 1 Chart Shows How Intense the Apple-Samsung Rivalry Really Is*, TIME (Apr. 29, 2015), http://time.com/3840414/samsung-apple-market-share.

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

3. Poornima Gupta, Miyoung Kim & Dan Levine, *Insight: Apple and Samsung, Frenemies for Life*, REUTERS (Feb. 10, 2013), https://www.reuters.com/article/net-us-apple-samsung/insight-apple-and-samsung-frenemies-for-life-idUSBRE91901Q20130210.

sued Samsung for patent infringement. The suit alleged infringement of several of Apple's utility patents, covering functional features of Apple's devices such as the ability to scroll, pinch, and zoom.[4] More unusually, the suit also alleged infringement of several design patents,[5] covering ornamental features of Apple's devices such as the shape of Apple's devices[6] and a screenshot of the iOS home screen.[7] Samsung vowed to respond aggressively to the complaint and protect its own intellectual property.[8]

The financial stakes were enormous. Apple claimed that "Samsung ha[d] reaped billions of dollars in profits and caused Apple to lose hundreds of millions of dollars through its violation of Apple's intellectual property."[9] A jury found Samsung liable for patent infringement and awarded Apple $1.049 billion, the largest patent verdict in history.[10] The award was later reduced to $539 million.[11] Almost all of the damages were due to infringement of Apple's design patents.[12] In other words, protection of the ornamental appearance of Apple's devices accounted for the majority of Samsung's liability to Apple.

Samsung appealed to the Supreme Court in an attempt to further reduce the award to Apple. In 2016, after ignoring them for more than a century, the Supreme Court heard a design-patent case.[13] Samsung raised a question concerning how to calculate damages in a design-patent case.[14] This case was important to more than just Apple and Samsung and it reached other industries

4. Apple asserted U.S. Patent No. 5,946,647, entitled *System and Method for Performing an Action on a Structure in Computer-Generated Data*. Complaint for Patent Infringement at 4, Apple, Inc. v. Samsung Elecs. Co., 920 F. Supp. 2d 1079 (N.D. Cal. Apr. 15, 2011) (No. CV111846), 2011 WL 1523826 [hereinafter Complaint].

5. *See generally* Sarah Burstein, *The Apple v. Samsung Retrial: Breaking Down Apple's Design Patent Claims*, COMPAR. PAT. REMEDIES (May 15, 2018, 7:25 PM), http://comparativepatentremedies.blogspot.com/2018/05/the-apple-v-samsung-retrial-breaking.html.

6. Apple asserted U.S. Design Patent Nos. 593,087 and D618,677, both entitled "Electronic Device." Complaint, *supra* note 4, at 7.

7. Apple asserted U.S. Design Patent No. D627,790, entitled *Graphical User Interface for a Display Screen of Portion Thereof*. *Id.*

8. Doug Aamoth, *Apple Sues Samsung, Samsung Vows To Counter (Icon Fight)*, TIME (Apr. 19, 2011), http://techland.time.com/2011/04/19/apple-sues-samsung-samsung-vows-to-counter-icon-fight.

9. Evan Ramstad, *Big Stakes in Patent War: Quarterly Results from Samsung and Apple Show How Large the Pot Has Grown*, WALL ST. J. (July 30, 2012), https://www.wsj.com/articles/SB10000872396390444130304577555711972764558.

10. Susan Beck, Vanessa Blum, Tom Coster, Julie McMahon & Jan Wolfe, *Big Suits; Apple Wins the Largest Patent Victory Ever Against Samsung—That Is, If the Award Stands*, AM. LAW. (Nov. 5, 2012), https://www.law.com/americanlawyer/almID/1202575853008.

11. Reuters, *Jury Awards Apple $539 Million in Samsung Patent Case*, N.Y. TIMES (May 25, 2018), https://www.nytimes.com/2018/05/24/business/apple-samsung-patent-trial.html.

12. *Id.*

13. Adam Liptak & Vindu Goel, *Supreme Court Gives Samsung a Reprieve in Apple Patent Case*, N.Y. TIMES (Dec. 6, 2016), https://www.nytimes.com/2016/12/06/technology/samsung-apple-smartphone-patent-supreme-court.html.

14. Reuters, *supra* note 11.

affected by design patents. Many large players in the fashion industry, such as Tiffany and Company, Adidas, Jenny Yoo, and Crocs, filed amicus briefs in support of Apple.[15] On the other side, Samsung was supported by a number of large high-tech entities, such as Google and Facebook.[16] This case demonstrates the importance of design patents to those in a range of industries, which, in turn, would suggest design-patent litigation's importance to scholarship and research. Despite this, empirical research has not yet caught up with design patents' increased significance.[17]

Prior to the Apple-Samsung case, the intellectual property literature often ignored design patents or treated them as interchangeable with utility patents. The problem with this approach, revealed by Apple-Samsung and validated by our empirical findings described below, is that design-patent litigation differs dramatically from utility-patent litigation in ways that have important consequences for the law.

But it would be equally problematic to assume that the Apple-Samsung case is representative of design-patent litigation overall. Creating doctrine to respond to the unique features of Apple-Samsung could have deleterious consequences for the mine run of design-patent cases. As Justice Holmes wrote more than a century ago, "Great cases like hard cases make bad law. For great cases are called great, not by reason of their real importance in shaping the law of the future, but because of some accident of immediate overwhelming interest which appeals to the feelings and distorts the judgment."[18]

Rather than assuming design-patent cases look like utility-patent cases or like Apple-Samsung, the better approach would be to base design-patent law on the reality of design-patent cases. Yet the existing empirical literature fails to provide a clear picture of design-patent litigation.

This Article aims to change that. We created a novel and comprehensive database of all lawsuits alleging design-patent infringement from 2000 to 2016. This Article reports the results of a broad empirical exploration of design-patent litigation. It answers existing questions about design-patent litigation and uncovers that our understanding of utility-patent litigation cannot be applied

15. *See* Amicus Curiae Brief of Crocs, Inc. in Support of Plaintiff-Appellee Apple, Inc. and in Support of Affirmance, Samsung Elecs. Co. v. Apple Inc., 137 S. Ct. 429 (2016) (No. 2014-1335); Brief for Tiffany and Co., Adidas AG & Jenny Yoo Collection, as Amici Curiae in Support of Respondent, Samsung Elecs. Co. v. Apple Inc., 137 S. Ct. 429 (2016) (No. 15-777), 2016 WL 4239194.

16. Reuters, *Court Agrees To Hear Samsung Appeal in Apple Case*, NEWSWEEK (Mar. 21, 2016), https://www.newsweek.com/supreme-court-agrees-samsung-appeal-apple-439204.

17. Janice M. Mueller & Daniel Harris Brean, *Overcoming the "Impossible Issue" of Nonobviousness in Design Patents*, 99 KY. L.J. 419, 423–24 (2011) (noting that design-patent law has received relative judicial and scholarly inattention); Peter Lee & Madhavi Sunder, *The Law of Look and Feel*, 90 S. CAL. L. REV. 529, 556 (2017) (noting that "design patents have not received nearly as much scholarly attention as other forms of intellectual property").

18. N. Secs. Co. v. United States, 193 U.S. 197, 400 (1904) (Holmes, J., dissenting).

generally to design-patent litigation. And these findings have important consequences for the law.

Our study reveals that utility- and design-patent litigation look very different in several important respects. First, we find that almost half of design-patent litigation involves small- or medium-sized companies as both plaintiffs and defendants.[19] Thus, while the press coverage of design-patent litigation naturally highlights the Apple-Samsung dispute, this type of conflict between two large players in an industry only accounts for about five percent of design-patent litigation.[20] In contrast, a prior study found that almost thirty percent of utility-patent litigation involved such "sport of kings" litigation.[21] Second, design-patent plaintiffs are almost always practicing entities who manufacture products. Less than one percent of design-patent cases involved patents acquired from another entity, and less than two percent involved individual inventor-owned startup companies.[22] This makes design-patent litigation quite different from utility-patent litigation, in which approximately one third of all cases are brought by nonpracticing entities who acquired the asserted patent or by individual inventor-owned startups.[23] Third, the amount of design-patent litigation has continuously increased over the last decade, while utility-patent-infringement lawsuits sharply increased and then dipped over the same period. Design-patent cases have almost tripled since 2000.[24] Finally, design-patent plaintiffs tend to file cases in different districts than utility-patent plaintiffs. Namely, we find that design-patent asserters did not participate in the flood of utility-patent litigation in the Eastern District of Texas. Thus, while the courts treat utility- and design-patent litigation as similar for many purposes, including understanding the doctrine and managing the docket, the actual litigation on the ground is starkly different. These differences have important implications for patent law.

The remainder of the Article proceeds in four parts. In Part I, we introduce the basics of design patents, including how they are different from utility patents. Next, in Part II, we review previous patent litigation scholarship, regarding utility and design patents. Part III details the methodology used to add to and analyze the dataset of all design-patent lawsuits. We discuss the results of the study of design-patent litigation in Part IV. First, Part IV presents the empirical results, including party size, party type, litigation venue, and patent classification. We provide a deeper dive on repeat litigants in the design-patent

19. *See infra* Figure 4 and Part IV.B.

20. *See infra* Figure 4 and Part IV.B.

21. 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, 1603 (2009).

22. *See infra* Table 2.

23. *See infra* Table 2.

24. *See infra* Figure 1 and Part IV.A.

space. Finally, we provide a brief conclusion that links our findings to cutting-edge issues in patent law. In sum, the Article provides a first glimpse of the hidden world of design patents, shedding light on how different design- and utility-patent litigation are, and why such differences have important policy implications.

I. BACKGROUND ON DESIGN PATENTS

This Part sets forth a brief explanation of utility- and design-patents and the differentiating factors between the two. It then reviews previous empirical scholarship on design- and utility-patent litigation.

A. Introduction to Utility Patents

The U.S. Patent Code protects inventions that are useful or functional with the grant of utility patents.[25] To obtain a utility patent, an applicant must file an application with the U.S. Patent and Trademark Office (the "Patent Office") and the invention must be: (1) a process, machine, article of manufacture, or composition of matter;[26] (2) novel;[27] (3) useful;[28] and (4) nonobvious.[29] The Patent Office assigns a technically trained examiner to each application to verify that it at least complies with these four requirements, among other things.[30]

Once issued by the Patent Office, a utility patent can be licensed or enforced.[31] A valid utility patent grants the owner the right to exclude others from making, selling, using, offering for sale, and importing the invention during the term of the patent.[32]

B. Introduction to Design Patents

The U.S. Patent Code also protects any "new, original and ornamental design for an article of manufacture."[33] Design-patent protection was

25. 35 U.S.C. §§ 100–57.

26. *Id.* § 101.

27. *Id.* § 102.

28. *Id.* § 101.

29. *Id.* § 103. For an interesting historical discussion of the evolution of the nonobviousness requirement as it pertains to design patents, see Jason J. Du Mont, *A Non-Obvious Design: Reexamining the Origins of the Design Patent Standard*, 45 GONZ. L. REV. 531 (2010).

30. Michael J. Meurer, *Patent Examination Priorities*, 51 WM. & MARY L. REV. 675, 681 (2009) ("The examiner is supposed to . . . assure that the application complies with the requirements of the Patent Act.").

31. Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495, 1497 (2001).

32. 35 U.S.C. § 271(a).

33. *Id.* § 171(a).

introduced in 1842[34] and has more recently become important for businesses. As defined recently by the Supreme Court, an article of manufacture is "simply a thing made by hand or machine."[35] Thus, design protection can be obtained for the design of any article made by hand or machine,[36] subject to additional requirements.

Design patents have grown in popularity in the past decade. From 2000 to 2015, the number of applications for design patents doubled,[37] and the number of issued design patents increased by fifty percent.[38] As of 2015, Samsung Electronics Co., Ltd. owned 6,159 U.S. design patents, the largest number out of any other entity.[39] As of 2015, Nike, Inc., with 3,210 U.S. design patents, owned the next largest number.[40]

An inventor can obtain a design patent on "any new, original and ornamental design for an article of manufacture,"[41] as long as the design is also novel[42] and nonobvious.[43] In general, the requirements of novelty and nonobviousness are not high hurdles for design patents.[44] The requirement of ornamentality means that the design must be not solely dictated by function.[45] Designs are not ornamental where "the appearance of the claimed design is 'dictated by' the use or purpose of the article."[46] In other words, the design

34. For a thorough history of the origins of design-patent rights in the United States, see Jason J. Du Mont & Mark D. Janis, *The Origins of American Design Patent Protection*, 88 IND. L.J. 837, 843 (2013).

35. Samsung Elecs. Co. v. Apple Inc., 137 S. Ct. 429, 435 (2016). For a richer discussion of the historical and current meanings of "article of manufacture," see Sarah Burstein, *The "Article of Manufacture" in 1887*, 32 BERKELEY TECH. L.J. 1 (2017); Sarah Burstein, *The "Article of Manufacture" Today*, 31 HARV. J.L. & TECH. 781 (2018).

36. One commentator has argued that design patents should be expanded to include virtual and augmented reality. *See* John R. Boulé III, Comment, *Redefining Reality: Why Design Patent Protection Should Expand to the Virtual World*, 66 AM. U. L. REV. 1113 (2017).

37. In 2000, the Patent Office received 18,282 design-patent applications. In 2015, they received 39,097 design-patent applications. EDWARD LEE, MARK MCKENNA & DAVID L. SCHWARTZ, THE LAW OF DESIGN 20 (2017).

38. *US Patent Activity: Calendar Years 1790 to Present*, U.S. PAT. & TRADEMARK OFF. https://www.uspto.gov/web/offices/ac/ido/oeip/taf/h_counts.htm (last visited Oct. 10, 2020) (reporting an increase from 17,413 design patents issued in 2000 to 25,986 design patents issued in 2015).

39. LEE ET AL., *supra* note 37, at 23 (citing U.S. PAT. & TRADEMARK OFF., DESIGN PATENTS (2016), https://www.uspto.gov/web/offices/ac/ido/oeip/taf/design.pdf).

40. *Id.*

41. 35 U.S.C. § 171(a).

42. *See id.* § 102.

43. *See id.* § 103.

44. *See* Sarah Burstein, *Is Design Patent Examination Too Lax?*, 33 BERKELEY TECH. L.J. 607 (2018).

45. Rosco, Inc. v. Mirror Lite Co., 304 F.3d 1373, 1378 (Fed. Cir. 2002) ("[I]f other designs could produce the same or similar functional capabilities, the design of the article in question is likely ornamental, not functional.").

46. L.A. Gear, Inc. v. Thom McAn Shoe Co., 988 F.2d 1117, 1123 (Fed. Cir. 1993). Some commentators have noted that the ornamentality requirement is not onerous in design-patent law. *See, e.g.*, Perry J. Saidman, *The Demise of the Functionality Doctrine in Design Patent Law,* 92 NOTRE DAME L. REV. 1471

cannot be governed by function alone.[47] This distinction is at the core of the differing purposes of utility and design patents.[48]

Similar to utility patents, "[d]esign patents provide the right to exclude others from making, selling, using, offering for sale, and importation of the design during the term of the patent."[49] The term of a design patent is fifteen years from the date of issuance.[50] In design-patent-infringement litigation, the scope of the claimed design is construed by reference to the figures.[51] Design features depicted in solid lines in the figures are considered part of the claimed design.[52] If an accused product falls within the scope of the construed claims, then the design patent has been infringed.[53] In more practical terms, to determine infringement, we ask if, "in the eye of an ordinary observer, giving such attention as a purchaser usually gives, [the] two designs are substantially the same."[54] The ordinary observer is one who is familiar with the prior art of the design patent.[55] "[T]wo designs are substantially the same, if the resemblance is such as to deceive such an observer, inducing [the ordinary observer] to purchase one supposing it to be the other . . . ."[56] Damages for

(2017). Mark McKenna and Chris Sprigman lament that the poor ornamentality doctrine in design-patent law results in inadequate channeling of IP protection.

> Design patent law's difficulty developing rules to channel functional features to utility patent is of greater concern. There are a variety of reasons for that difficulty, and not all of them are the result of conceptual confusion about utility patent's domain. One significant reason is that the distinction is pitched as an either/or — between functional features, on the one hand, and ornamental features on the other.

See Mark P. McKenna & Christopher Jon Sprigman, *What's In, and What's Out: How IP's Boundary Rules Shape Innovation*, 30 HARV. J.L. & TECH. 491, 517 (2017).

47. Seiko Epson Corp. v. Nu-Kote Int'l, Inc., 190 F.3d 1360, 1368 (Fed. Cir. 1999). For a more detailed description of functionality in design patents, see Sarah Burstein, Faux Amis *in Design Law*, 105 TRADEMARK REP. 1455 (2015).

48. "[U]tility patents . . . cover the mechanical structures and functions of articles, design patents protect the visual look of an article." LEE ET AL., *supra* note 37, at 58.

49. *Id.* at 103.

50. 35 U.S.C. § 173 (indicating that there is a fifteen-year term for design patents filed on or after May 13, 2015; previously, the term was fourteen years).

51. Egyptian Goddess, Inc. v. Swisa, Inc., 543 F.3d 665 (Fed. Cir. 2008) (en banc).

52. *Id.*

53. LEE ET AL., *supra* note 37, at 107; Curver Lux., SARL v. Home Expressions Inc., 938 F.3d 1334, 1338 (Fed. Cir. 2019).

54. LEE ET AL., *supra* note 37, at 107 (citing Gorham Co. v. White, 81 U.S. 511 (1871)). The standard of similarity, however, in some cases is so high that one may need to show actual copying to prove infringement. Sarah Burstein, *Intelligent Design &* Egyptian Goddess*: A Response to Professors Buccafusco, Lemley & Masur*, 68 DUKE L.J. ONLINE 94, 114–15 (2019).

55. *Egyptian Goddess*, 543 F.3d at 677; Andrew Beckerman-Rodau, *Design Patent Evolution: From Obscurity to Center Stage*, 32 SANTA CLARA HIGH TECH. L.J. 53, 82 (2015).

56. LEE ET AL., *supra* note 37, at 107 (citing Gorham Co. v. White, 81 U.S. 511 (1871)). In one sense, the design-patent-infringement test mainly comprises visually comparing the claimed design with the accused product. Christopher Buccafusco, *Making Sense of Intellectual Property Law*, 97 CORNELL L. REV. 501, 524 (2012) (arguing that design law focuses on the sense of sight). Rebecca Tushnet has argued that because design-patent infringement zeros in on images, the test for infringement feels unsatisfactory to many people.

design-patent infringement include the remedies available to successful utility-patent holders. These include injunctions,[57] the patent owner's lost profits,[58] and reasonable royalties.[59] However, design-patent holders are potentially entitled to important and distinct remedies that utility-patent holders are not: disgorgement of profits.[60] The disgorgement of profits remedy has been controversial, especially when the covered design is a multicomponent product. Many hoped that the U.S. Supreme Court would expressly outlaw disgorgement of total profits for multicomponent products in its *Apple v. Samsung* decision.[61] The U.S. Supreme Court issued a short opinion that did not provide a definitive ruling on when disgorgement of total profits was available for multicomponent products and when the profits must be apportioned among the various components.[62] Thus, design-patent plaintiffs currently have the potential to seek the strong remedy of disgorgement of the defendant's profits.

C. Design-Patent Litigation

Patent infringement occurs when another makes, uses, sells, offers to sell, or imports into the United States a patented invention without permission.[63] If

Rebecca Tushnet, *The Eye Alone is the Judge: Images and Design Patents,* 19 J. INTELL. PROP. L. 409, 419–20 (2012).

57. 35 U.S.C. § 283 ("[C]ourts . . .may grant injunctions in accordance with the principles of equity to prevent the violation of any right secured by patent, on such terms as the court deems reasonable."). The U.S. Supreme Court held that courts should weigh four equitable factors in deciding whether to grant or deny an injunction. eBay Inc. v. MercExchange, L.L.C., 547 U.S. 388, 391 (2006).

58. Mark A. Lemley, *Distinguishing Lost Profits from Reasonable Royalties,* 51 WM. & MARY L. REV. 655, 657 (2009) ("Giving patentees the profits they would have made absent the infringement effectively puts them in the same position as if they had had an injunction in place all along.").

59. 35 U.S.C. § 284 (noting that an infringer shall be liable for "damages adequate to compensate for the infringement, but in no event less than a reasonable royalty").

60. 35 U.S.C. § 289 (indicating that an infringer of a design patent "shall be liable to the owner to the extent of his total profit").

61. Because Samsung was the petitioner to the Supreme Court, the decision is captioned *Samsung v. Apple*, not *Apple v. Samsung*. For consistency herein, we will refer to the dispute as *Apple v. Samsung* since that was the caption in the trial court, and Apple sought and received compensation from Samsung for infringing Apple's patents.

62. *See* Samsung Elecs. Co. v. Apple Inc., 137 S. Ct. 429, 436 (2016); *see generally* Mark A. Lemley, *A Rational System of Design Patent Remedies*, 17 STAN. TECH. L. REV. 219, 221 (2013) (arguing that disgorgement of profits for design patents should be abolished); Ted Kang, Samsung v. Apple*: The Ill-Fated Introduction of Apportionment-by-Component for Designs*, 33 BERKELEY TECH. L.J. 889, 906 (2018) (arguing that the U.S. Supreme Court erred by even introducing the concept of an apportionment-by-component test); Elizabeth M. Gil, Samsung v. Apple*: Taking a Bite Out of the Design Patent "Article of Manufacture" Controversy*, 25 U. MIAMI BUS. L. REV. 67, 84–86 (2017) (articulating a test for determining when to apportion damages for multicomponent products).

63. 35 U.S.C. § 271(a) ("Except as otherwise provided in this title, whoever without authority makes, uses, offers to sell, or sells any patented invention, within the United States or imports into the United States any patented invention during the term of the patent therefor, infringes the patent.").

the patent is infringed, the patent owner will be entitled to damages and may seek an injunction from the court.[64]

Patent asserters may have a choice of venue in which to file their complaint. While all design-patent litigation must be filed in federal court,[65] per the patent venue statute, "[a]ny civil action for patent infringement may be brought [1] in the judicial district where the defendant *resides*, or [2] where the defendant has committed acts of infringement and has a regular and established place of business."[66] In 1990, the Federal Circuit held that "resides" includes districts where the accused infringer is incorporated and any district where they would be subject to personal jurisdiction.[67] Flexibility in venue choice led to an increased number of utility-patent-infringement litigation filings in the Eastern District of Texas.[68] The Supreme Court limited this flexibility in 2017, when it decided *TC Heartland LLC v. Kraft Foods Group Brands LLC*.[69]

In *TC Heartland*, the Supreme Court held that, for purposes of patent venue, a domestic corporation accused of patent infringement only "resides" in its state of incorporation.[70] Due to this change, the Eastern District of Texas saw a sharp decrease in the number of utility-patent filings, while other districts, such as the District of Delaware, the Central and Northern Districts of California, and the Northern District of Illinois saw an increase.[71] Since *TC Heartland*, high-volume-plaintiffs' patent filings are the highest in the District of Delaware, Eastern District of Texas, Northern District of California, Central District of California, and Northern District of Illinois.[72] Although many cases are still filed in the Eastern District of Texas, high-volume-plaintiffs' filings dropped from sixty percent in the year prior to *TC Heartland* to only nineteen

64. Shyh-Jen Wang, *The Flow Chart of Design Patent Infringement*, 87 J. PAT. & TRADEMARK OFF. SOC'Y 761, 762 (2005) ("The patentee may ask the court for an injunction to prevent the continuation of the infringement and may also ask the court for an award of damages because of the infringement." (footnotes omitted)).

65. 28 U.S.C. § 1338(a) (granting exclusive jurisdiction to the federal courts over cases "arising under any Act of Congress relating to patents").

66. 28 U.S.C. § 1400(b) (emphasis added).

67. VE Holding Corp. v. Johnson Gas Appliance Co., 917 F.2d 1574, 1583 (Fed. Cir. 1990). This decision incorporated the general-venue statute into the patent-venue statute. *See* 28 U.S.C. § 1391(c).

68. *See* J. Jonas Anderson, *Court Competition for Patent Cases*, 163 U. PA. L. REV. 631, 653 (2015); Yan Leychkis, *Of Fire Ants and Claim Construction: An Empirical Study of the Meteoric Rise of the Eastern District of Texas as a Preeminent Forum for Patent Litigation*, 9 YALE J.L. & TECH. 193, 214 (2007).

69. *See* TC Heartland LLC v. Kraft Foods Grp. Brands LLC, 137 S. Ct. 1514 (2017); *see also* Ofer Eldar & Neel U. Sukhatme, *Will Delaware Be Different? An Empirical Study of* TC Heartland *and the Shift to Defendant Choice of Venue*, 104 CORNELL L. REV. 101, 104 (2018).

70. *TC Heartland*, 137 S. Ct. at 1517.

71. Gregory Parker & Andrew J. Rittenhouse, *The Profound Effect of* TC Heartland *on Patent Litigation*, L.J. NEWSLS. (Jan. 2018), http://www.lawjournalnewsletters.com/2018/01/01/the-profound-effect-of-tc-heartland-on-patent-litigation/?slreturn=20190119234249.

72. Geneva Clark, TC Heartland*, Legal Trends, One Year Later*, LEXMACHINA (May 23, 2018), https://lexmachina.com/tc-heartland-legal-trends-one-year-later.

percent in the year following.[73] Thus far, the trend in venue prior to and following *TC Heartland* for design-patent litigation individually has not been studied.

II. REVIEW OF PREVIOUS SCHOLARSHIP

Many attorneys believe that design patents have numerous benefits and are advantageous to those seeking protection for their designs.[74] But despite praise, design patents have not been accepted by all.[75] Some critics argue that designs are simply not subject matter suitable for patent protection, generally stating that designs are, or are like, art and should be protected by copyright.[76] Many also argue that the substantive and procedural requirements for utility patents are not appropriate for design patents.[77] Some even argue that the design-patent

73. *Id.*

74. *See* Perry J. Saidman, *Design Patents—the Whipping Boy Bites Back*, 73 J. PAT. & TRADEMARK OFF. SOC'Y 859, 860 (1991); Perry J. Saidman & Mark B. Mondry, *Sneakers, Design Patents and Summary Judgments: Opening a New Era in the Protection of Consumer Product Designs*, 71 J. PAT. & TRADEMARK OFF. SOC'Y 524, 536 (1989) ("U.S. design patents have many benefits which presently make their application in the consumer product arena exceptionally attractive."); Dennis D. Crouch, *A Trademark Justification for Design Patent Rights* (Univ. of Mo. Sch. of L. Legal Stud. Research Paper No. 2010-17), https://parpers.ssrn.com/sol3/papers.cfm?abstract_id=1656590 ("tentatively reject[ing] the oft-stated conventional wisdom that design patents are worthless for many because they are too slow, expensive, and difficult to obtain").

75. *See* Sarah Burstein, *Moving Beyond the Standard Criticisms of Design Patents*, 17 STAN. TECH. L. REV. 305, 306–07 (2013).

76. *See* Daniel H. Brean, *Enough Is Enough: Time To Eliminate Design Patents and Rely on More Appropriate Copyright and Trademark Protection for Product Designs*, 16 TEX. INTELL. PROP. L.J. 325, 374 (2008); Orit Fischman Afori, *Reconceptualizing Property in Designs*, 25 CARDOZO ARTS & ENTM'T L.J. 1105, 1107 (2008). For discussions related to the interface between design patents and other types of intellectual property, i.e., copyright, trademark, and trade dress, see Crouch, *supra* note 74; Jason J. Du Mont & Mark D. Janis, *U.S. Design Patent Law: A Historical Look at the Design Patent/Copyright Interface* (Ind. Legal Stud. Rsch. Paper No. 360); Burstein, *supra* note 47; Jeanne C. Fromer & Mark P. McKenna, *Claiming Design*, 167 U. PA. L. REV. 123 (2018).

77. For a discussion of the application of the novelty requirement to design patents, see Afori, *supra* note 76, at 1135–39; Roy V. Jackson, *A New Approach to Protection for the Designs of New Products*, 38 J. PAT. OFF. SOC'Y 448, 458 (1956). For a discussion of the application of the nonobviousness requirement to design patents, see Sarah Burstein, *Visual Invention*, 16 LEWIS & CLARK L. REV. 169, 213 (2012) (proposing a new way to apply § 103 so that "[t]he scope of the prior art should be limited to designs for products of the same type of product"); Du Mont, *supra* note 29, at 535 (arguing that the requirement of nonobviousness should be abolished for design patents); Maureen Long, *The Nonobviousness Requirement for Design Patents: What Is the Standard and Why Shouldn't It Obviously Be Modified After* KSR*?*, 45 AIPLA Q.J. 193, 199 (2017) (proposing modifications to the test for design-patent nonobviousness); Paul Morgan, *Design Patents §103 – Obvious to Whom and as Compared to What?*, PATENTLYO (Sept. 17, 2014), https://patentlyo.com/patent/2014/09/%C2%A7103-obvious-compared.html. For a discussion of disclosure in design patents, see Jason Du Mont & Mark D. Janis, *Disclosing Designs*, 69 VAND. L. REV. 1631 (2016). For a discussion of the length of time it takes to obtain a design patent, see William T. Fryer, III, *Industrial Design Protection in the United States of America—Present Situation and Plans for Revision*, 19 U. BALT. L. REV. 198, 198 (1989) (noting that it takes too long to get a design patent); Christopher P. Bussert, *Copyright Law: A Review of the "Separability Test" and a Proposal for New Design Protection*, 10 RUTGERS COMPUT. & TECH. L.J. 59, 68 (1984). For a discussion of the cost of design-patent protection, see Perry J. Saidman, *The Crisis in the Law of Designs*, 89 J. PAT. & TRADEMARK OFF. SOC'Y 301, 331 (2007) ("Some of the biggest objections to design patents over the years have been that they take too long to get, that they cost too much, that you can only protect one design per application, and that it is

system is too strict and excludes too many designs.[78] Finally, there is much discussion surrounding how design-specific requirements, such as ornamentality, and the infringement test should apply.[79] None of these debates are central to the empirical study we undertake. We highlight them to show that academics have begun to critically evaluate design-patent-law doctrines, usually by comparison with analogous utility-patent-law doctrines. Empirical data is largely lacking from these discussions and debates.

A. Prior Literature About Design Patents

Design patents have also been the subject of literature outside the debate of whether design patents are good or bad. In the following paragraphs, we will consider other topics of discussion, including design-patent industries and litigation, in general and in terms of nonpracticing entities. We also highlight voids in the current empirical literature.

hard to satisfy the design patent standard of 'non-obviousness.'"); Dennis Crouch, *Design Patent Rejections*, PATENTLYO (Jan. 19, 2010), https://patentlyo.com/patent/2010/01/design-patent-rejections.html (noting that in 2009, 81.6% of design patents were not rejected during prosecution); Crouch, *supra* note 74, at 18–23 (reporting prosecution statistics about design patents including average pendency and rejection information); Sarah Burstein, *Costly Designs*, 77 OHIO ST. L.J. 107, 107 (2016) ("[T]he cost of design patent examination serves a valuable function . . . by screening out at least some bad design patents."); Dunstan H. Barnes, *Design Patent Rejections – Update*, BIGPATENTDATA (Apr. 14, 2019), https://bigpatentdata.com/2019/04/design-patent-rejections-update/ (design patents without prosecution rejections dropped to 70.7% in 2017); FRANK L. GERRATANA, AM. INTELL. PROP. L. ASS'N, REPORT OF THE ECONOMIC SURVEY 2019 4 (2019) (estimating the mean and median typical charges and costs for a U.S. design application to be under $2,000).

78. *See* Steve W. Ackerman, *Protection of the Design of Useful Articles: Current Inadequacies and Proposed Solutions*, 11 HOFSTRA L. REV. 1043, 1053 (1983) (arguing that designs should not be subject to "rigorous requirements"); David Goldenberg, *The Long and Winding Road: A History of the Fight over Industrial Design Protection in the United States*, 45 J. COPYRIGHT SOC'Y U.S.A. 21, 22 (1997); Perry J. Saidman & Theresa Esquerra, *A Manifesto on Industrial Design Protection: Resurrecting the Design Registration League*, 55 J. COPYRIGHT SOC'Y U.S.A. 423, 425 (2008). *But see* Burstein, *supra* note 44, at 611 ("[T]he U.S. Court of Appeals for the Federal Circuit has made it nearly impossible for the USPTO to reject any design patent claim . . . .").

79. For a discussion of the application of the ornamentality requirement, see Jason J. Du Mont & Mark D. Janis, *Functionality in Design Protection Systems*, 19 J. INTELL. PROP. L. 261, 264–71 (2012); Christopher V. Carani, *Design Patent Functionality: A Sensible Solution*, LANDSLIDE, Nov.–Dec. 2014, at 19; Christopher Buccafusco, Mark A. Lemley & Jonathan S. Masur, *Intelligent Design*, 68 DUKE L.J. 75, 78 (2018). *But see* Burstein, *supra* note 54. For a discussion related to the test of infringement in design-patent litigation, see Christopher V. Carani, *The New "Extra-Ordinary" Observer Test for Design Patent Infringement—On a Crash Course with the Supreme Court's Precedent in* Gorham v. White, 8 J. MARSHALL REV. INTELL. PROP. L. 354, 380 (2009) ("Federal Circuit . . . improperly replac[ed] the 'ordinary observer' test with an '*extra*-ordinary observer' test."); Sarah Burstein, *The Patented Design*, 83 TENN. L. REV. 161, 165 (2015) ("[P]atented design should be conceptualized as the design as applied to a specific type of product . . . ."); Burstein, *supra* note 35, at 11.

> For a design patent claiming a design for surface ornamentation, the relevant article should be deemed to be whatever article the design was printed, painted, cast, or otherwise placed on or worked into. For a design patent that claims a design for a configuration or a combination design, the relevant article should be deemed to be the article whose shape is dictated by the claimed design.

Burstein, *supra* note 35, at 838 (footnotes omitted)); Perry Saidman, *Design Patent Damages: A Critique of the Government's Proposed 4-Factor Test for Determining the "Article of Manufacture"*, 8 IP THEORY 87 (2019).

Design patents are clustered in certain industries. Some industries, as hypothesized by scholars, are particularly suited to design-patent protection. For example, many scholars have studied the role of design patents in fashion.[80] Others have suggested it has an important place in graphical user interfaces.[81] The Patent Office classifies U.S. patents into categories based on common subject matter.[82] Design patents are classified according to the U.S. Patent Classification (USPC) system and are broken down into thirty-three categories. According to the Patent Office, the most granted patents are in D14, the category for recording, communication, or information-retrieval equipment.[83] As of 2015, 53,496 patents were granted in this category.[84] The next highest category for granted patents is D06, the category for furnishings.[85] There were 43,253 patents granted in this category as of 2015.[86] Another way of categorizing patents is through the North American Industry Classification System (NAICS). This system provides industry groupings based on what companies produce.[87] The Patent Office provides data on patent granting by NAICS categories for utility patents but not for design patents.[88]

B. Prior Empirical Data About Design Patents

There is only limited publicly available empirical data about design patents and almost none about design-patent litigation. On the prosecution of patent designs, Dunstan Barnes recently published a series of useful and informative

80. *See, e.g.*, Christopher Buccafusco & Jeanne C. Fromer, *Fashion's Function in Intellectual Property Law*, 93 NOTRE DAME L. REV. 51 (2017); Dennis Crouch, *Design Patents and the Fashion Industry*, PATENTLYO (Dec. 6, 2010), https://patentlyo.com/patent/2010/12/design-patents-and-the-fashion-industry.html; Charlene A. Azema, Bita Kianian & Robert Roby, *The Crown Jewels: How To Protect Your Jewelry Designs*, KNOBBE MARTENS (Jan. 16, 2019), https://www.knobbe.com/news/2019/01/crown-jewels-how-protect-your-jewelry-designs (discussing design-patent protection for jewelry).

81. *See, e.g.*, Jason J. Du Mont & Mark D. Janis, *Virtual Designs*, 17 STAN. TECH. L. REV. 107 (2013); Christopher V. Carani & Dunstan H. Barnes, *Graphical User Interfaces*, WORLD TRADEMARK REV. (Dec. 11, 2017), https://www.worldtrademarkreview.com/portfolio-management/graphical-user-interfaces.

82. *Patent Classification*, U.S. PAT. & TRADEMARK OFF., https://www.uspto.gov/patents-application-process/patent-search/classification-standards-and-development (last visited Oct. 11, 2020). The Federal Circuit recently held that the title and claim litigation may limit the scope of design-patent protection. Curver Lux., SARL v. Home Expressions Inc., 938 F.3d 1334, 1336 (Fed. Cir. 2019) (holding that a patent with the title "Pattern for a Chair" and claiming "an 'ornamental design for a pattern for a chair'" did not extend to another article of manufacture, namely a basket).

83. PATENT COUNTS BY CLASS BY YEAR JANUARY 1977–DECEMBER 2015, U.S. PAT. & TRADEMARK OFF. 18 (Mar. 28, 2016).

84. *Id.* at 18.

85. *Id.*

86. *Id.*

87. EXEC. OFF. OF THE PRESIDENT, NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM 15 (2017).

88. *See* U.S. PAT. & TRADEMARK OFF., U.S. PATENTING TRENDS BY NAICS INDUSTRY CATEGORY UTILITY PATENT GRANTS, CALENDAR YEARS 1963–2012, https://www.uspto.gov/web/offices/ac/ido/oeip/taf/naics/naics_toc.htm (last visited Oct. 11, 2020).

blog posts on BigPatentData.[89] While the Patent Office data and existing scholarly work confer an idea of what industries are most represented in design patenting, none provide any data on what industries design patents are most litigated in. To the extent that there are articles on patent litigation that include design patents, none divide design patents by industry.[90]

Design-patent litigation has been a minor subject of empirical discussion compared to the breadth of knowledge known about utility-patent litigation. Others have conducted studies on various features of patent litigation, but virtually none of these studies track trends unique to design patents. This void exists partially because design patents have historically been viewed as lacking significant value.[91] First, we will discuss previously conducted studies on design-patent litigation, where the datasets contained only design-patent litigation. Next, we will highlight patent-litigation studies with datasets containing aggregated utility- and design-patent data. Finally, we will discuss studies with datasets expressly excluding design-patent litigation.

No prior work has studied the facets of design-patent litigation analyzed in this study. The closest literature we could identify was an experiment conducted by Dr. Andrew W. Torrance. Torrance evaluated the underlying designs in design-patent-validity challenges to determine if courts favor more attractive designs, as measured by a survey.[92] Utilizing design-patent decisions from 1982 to 2010, Torrance found that courts do not discriminate between attractive and unattractive designs.[93]

While there are some studies that include design- and utility-patent-litigation data, they do not reflect trends in design-patent litigation. These studies aggregate design- and utility-patent data. Because utility patents make up a greater portion of issued and asserted patents,[94] their results skew heavily toward describing utility-patent trends. Therefore, we cannot

89. Barnes, *supra* note 77; Dunstan H. Barnes, *Design Patent Applications That Go "Straight Through,"* BIGPATENTDATA (Feb. 24, 2020), https:bigpatentdata.com/2020/02/design-patent-applications-that-go-straight-through; Dunstan H. Barnes, *Design Patent Rejections – Update (Part 2)*, BIGPATENTDATA (Aug. 19, 2019), https://bigpatentdata.com/2019/08/design-patent-rejections-update-part-2.

90. *See, e.g.*, Gwendolyn G. Ball & Jay P. Kesan, *Transaction Costs and Trolls: Strategic Behavior by Individual Inventors, Small Firms and Entrepreneurs in Patent Litigation* 18 (Ill. Pub. L. & Legal Theory Papers Series, Rsch. Papers Series No. D8-211, 2009) (stating that there is a separate technology category for design patents: "[w]hen there were both design patents and utility patents at issue in the same case, we used the utility patent").

91. Beckerman-Rodau, *supra* note 55, at 54 (arguing that the *Apple v. Samsung* verdict sparked scholarship into design patents, "effectively ending a dearth of academic writing on design patents which extended back several decades" (footnote omitted)).

92. Andrew W. Torrance, *Beauty Fades: An Experimental Study of Federal Court Design Patent Aesthetics*, 19 J. INTELL. PROP. L. 389, 390 (2012).

93. *Id.*

94. In 2018, the USPTO issued 29,441 design patents and 306,909 utility patents. U.S. PAT. & TRADEMARK OFF., FY 2018 PERFORMANCE AND ACCOUNTABILITY REPORT 181 tbl.6 (2018). The ratio of utility patents issued to design patents issued has stayed relatively constant from 2014 to 2018. *Id.*

make conclusions on design-patent litigation based on these studies. One older study provides some insight into how much design-patent litigation occurred. Gwendolyn G. Ball and Jay P. Kesan conducted an empirical study on patent-asserting entities and entity size in patent-litigation suits filed during 2000 and 2002.[95] Ball and Kesan made several observations, including that about a quarter of pairs were small plaintiff and small defendant and a fifth were small plaintiff and large defendant, or vice versa.[96] In addition to categorizing entity size, Ball and Kesan collected data on the technology at issue in the asserted patent.[97] Out of the 2,853 patent-infringement suits studied, only 268, or 9.39%, were design-patent suits.[98] Other than this summary statistic in a table, Ball and Kesan do not discuss design-patent litigation in the article.

Others have conducted empirical studies that expressly excluded suits alleging design-patent infringement from their datasets. Jason Rantanen's carefully constructed *Compendium of Federal Circuit Decisions* is a notable exception.[99] Rantanen identifies the underlying patents in the disputes, including design patents.[100] The *Compendium*, however, does not include information about district court litigation, only federal circuit appeals. Most empirical studies of district-court litigation intentionally exclude design patents.[101] For instance, John Allison, Mark Lemley, and David Schwartz conducted a series of empirical studies on utility-patent lawsuits.[102] Those studies analyzed utility-patent-infringement lawsuits filed in 2008 and 2009 to collect information on various aspects of utility-patent litigation.[103] Allison,

95. Ball & Kesan, *supra* note 90, at 13.

96. *Id.* at 17.

97. *Id.* at 18.

98. The total number of patent suits studied represents those suits where Ball and Kesan were able to determine the patent number asserted in the suit. *See id.* at 37 tbl.7.b.

99. *Federal Circuit Decisions Database*, FEDERAL COMPENDIUM, https://fedcircuit.shinyapps.io/federal compendium (last visited Oct. 11, 2020). Basic descriptives from the data are reported in Jason Rantanen, *The Landscape of Modern Patent Appeals*, 67 AM. U. L. REV. 985 (2018).

100. The Codebook notes that design patents are identified. *See* CODEBOOK FOR THE *COMPENDIUM OF FEDERAL CIRCUIT DECISIONS* 13 (June 26, 2019).

101. *See* Chien, *supra* note 21, at 1595 nn.139–41 (no design-patent classifications included); John R. Allison, Mark A. Lemley & David L. Schwartz, *Understanding the Realities of Modern Patent Litigation*, 92 TEX. L. REV. 1769, 1773 (2014) [hereinafter *Understanding Realities*] ("[W]e excluded inventorship and licensing disputes, malpractice actions, and allegations of design or plant patent infringement."); John R. Allison, Mark A. Lemley & David L. Schwartz, *Our Divided Patent System*, 82 U. CHI. L. REV. 1073, 1081 (2015) [hereinafter *Our Divided Patent System*] ("[W]e excluded inventorship and licensing disputes, malpractice actions, and allegations of design or plant patent infringement."). We only found a single study of design-patent litigation, and it was extremely basic and dated. Raymond L. Walter, *A Ten Year Survey of Design Patent Litigation*, 35 J. PAT. OFF. SOC'Y 389, 390 (1953) (reporting the number of design patents litigated yearly from 1942 until 1951 and the number found valid and invalid).

102. Allison et al., *Understanding Realities*, *supra* note 101; Allison et al., *Our Divided Patent System*, *supra* note 101; John R. Allison, Mark A. Lemley & David L. Schwartz, *How Often Do Non-Practicing Entities Win Patent Suits?*, 32 BERKELEY TECH. L.J. 237, 237 (2017) [hereinafter *NPEs Win Patent Suits*].

103. Allison et al., *Understanding Realities*, *supra* note 101, at 1773.

Lemley, and Schwartz found that utility-patent litigation has changed in the past twenty years, including the Eastern District of Texas becoming a top district,[104] and "assess[ed] the outcome of [utility-patent] litigation by technology and industry."[105] Allison, Lemley, and Schwartz discovered that, as a whole, utility patentees lose most cases, but more specifically, chemistry and pharmaceutical patents are more likely to be valid and infringed than software patents.[106] As another example, Colleen V. Chien performed a study on all high-tech patent cases initiated in U.S. district courts from January 2000 to March 2008. Chien analyzed entity size based on annual revenue data in high-tech patent cases.[107]

C. Prior Literature About Nonpracticing Entities

Within the discussion of patent litigation, nonpracticing entities are the subject of much debate. A nonpracticing entity (NPE) is "an entity that owns patents but does not create or sell products or services."[108] Some refer to NPEs pejoratively as "patent trolls," a term that was coined in the late twentieth century that refers to "patent holders [who] wait until another brings a product to market and then jump from under the bridge to demand a toll."[109] Yet another term used to describe an NPE is a "patent-assertion entity" (PAE).[110] NPEs range from universities to entities who have acquired patents from others, but not all use patent assertion primarily to obtain license fees. The current debate about NPEs focuses on utility-patent litigation, but one commentator found a historical example of a design-patent "troll."[111] Many believe that entities whose main goal is to collect fees put excessive costs on businesses, consumers, and the courts and impede innovation as a whole.[112]

104. *Id.* at 1800–01.

105. Allison et al., *Our Divided Patent System*, *supra* note 101, at 1073.

106. *Id.* at 1124.

107. Chien uses different definitions to define the relationship between the parties. Variations on those definitions are used in our study. Chien, *supra* note 21, at 1589.

108. Shawn P. Miller et al., *Who's Suing Us? Decoding Patent Plaintiffs Since 2000 with the Stanford NPE Litigation Dataset*, 21 STAN. TECH. L. REV. 235, 238 (2018).

109. David L. Schwartz & Jay P. Kesan, *Analyzing the Role of Non-Practicing Entities in the Patent System*, 99 CORNELL L. REV. 425, 426 (2014) (footnote omitted).

110. *Id.*

111. "Troll-like" behavior may have begun as early as the nineteenth century. Gerard N. Magliocca, *Blackberries and Barnyards: Patent Trolls and the Perils of Innovation*, 82 NOTRE DAME L. REV. 1809, 1811 (2007). Beginning with a change in the design-patent law in the late 1860s, there was a rush of design patents on commonly used, but never design-patent-protected, farm tools. *Id.* at 1812 n.15. The patent owners sold their rights to what we now call "patent sharks," who sued farmers using their protected technology. *Id.* at 1811. The "patent sharks" demanded settlements from the farmers, much like the behavior we see from some NPEs today. Neel Chatterjee, *Patent 'Gold Rush' To Blame for Patent Sharks, Patent Trolls*, IP WATCHDOG (Aug. 13, 2017), https://www.ipwatchdog.com/2017/08/13/patent-gold-rush-patent-sharks-patent-trolls/id=86649. While design-patent doctrine has since changed to generally disallow solely functional designs like those asserted by the sharks, the earliest NPEs may well have been in the design-patent arena.

112. Miller et al., *supra* note 108.

Some agree that NPE litigation has risen throughout the years,[113] but not all have adopted the idea that NPE litigation has had a significant impact on patent litigation as a whole.[114] Additionally, much of the debate surrounds the question of whether NPE activity has a net negative or net positive impact.[115]

113. *See* Michael Risch, *Patent Troll Myths*, 42 SETON HALL L. REV. 457, 458 (2012) ("Scholars, practitioners, and entrepreneurial businesses have all recognized the growing number of patent plaintiffs who do not produce a product or sell a service . . . ."); Steven Musil, *Patent Trolls Now Behind Most Patent Infringement Lawsuits*, CNET (Dec. 10, 2012), http://news.cnet.com/8301-1023_3-57558384-93/patent-trolls-now-behind-most-patent-infringement-lawsuits; Robin Feldman, *The AIA 500 Expanded: The Effects of Patent Monetization Entities*, 17 UCLA J.L. & TECH. 1, 37 (2013) [hereinafter *AIA 500 Expanded*] ("In 2007, monetizers filed only 24.6% of the patent infringement lawsuits. Monetizers filed 40.4% of the lawsuits in 2011. Most significantly, monetizers crossed into the majority in 2012, having filed 58.7% of patent infringement lawsuits."); Schwartz & Kesan, *supra* note 109, at 426 ("But recently, an increasing number of patent lawsuits have been initiated by entities who do not manufacture products themselves . . . ."); Christopher A. Cotropia, Jay P. Kesan & David L. Schwartz, *Unpacking Patent Assertion Entities (PAEs)*, 99 MINN. L. REV. 649, 655 (2014) [hereinafter *Unpacking PAEs*] ("Our data reveals a modest increase in the number of Patent Holding Companies and in the number of Individual Inventor suits."); Miller et al., *supra* note 108, at 242 ("[T]he share of litigation attributable to PAEs (our Categories 1, 4 and 5) rose from about 15% during the early 2000s to about 45% since 2010." (footnote omitted)). *But see* Colleen V. Chien, *Patent Trolls by the Numbers* (Santa Clara Univ., Legal Stud. Rsch. Paper No. 08-13, 2013), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2233041 ("The share of suits brought by PAEs in 2012 grew from 2011. However, the AIA's misjo[i]nder rules, which curbed the troll tactic of naming multiple unrelated defendants in a single suit which had artificially deflated troll suit numbers, are responsible. Thus, the increase in the number of troll suits, post-AIA, is most likely an artifact of the AIA.").

114. For discussion on why NPEs are significant in patent litigation, see *AIA 500 Expanded, supra* note 113, at 37 ("The data confirm that patent monetization entities are having a dramatic impact on U.S. patent litigation."); *NPEs Win Patent Suits*, *supra* note 102, at 237 ("NPE suits represent a significant feature of the patent system. They account for a majority of all defendants sued for patent infringement."). For a discussion on why NPEs do not play a significant role in patent litigation, see Chien, *supra* note 21, at 1572 (NPEs "bring only a minority of patent suits"); Ball & Kesan, *supra* note 90, at 15 ("To the extent that licensing firms are the principal candidates to be 'trolls,' it does not appear that the patent courts are 'overrun' by such firms."); *Unpacking PAEs*, *supra* note 113, at 655 ("[T]he often-repeated 'explosion' of PAE litigation from 2010 to 2012 is almost completely a myth.") (finding that packaging all NPEs together shows significant place, but they should not be packaged like that because they are different. For example, "[i]ndividual Inventors are rarely explicitly described as trolls but are often included in the counts of 'bad' lawsuits.").

115. Some argue that NPEs assert weak and vague patents in frivolous lawsuits to threaten alleged infringers and extract high licensing fees. *See* Lauren Cohen, Umit G. Gurun & Scott Duke Kominers, *Patent Trolls: Evidence from Targeted Firms*, 65 MGMT. SCI. 5461, 5478 (2019) ("NPE litigation has a real negative impact on innovation at targeted firms: firms substantively reduce their innovative activity after settling with NPEs (or losing to them in court)."); Sannu K. Shrestha, *Trolls or Market-Makers? An Empirical Analysis of Nonpracticing Entities*, 110 COLUM. L. REV. 114, 115, n.8 (2010) (citing Robin M. Davis, Note, *Failed Attempts to Dwarf the Patent Trolls: Permanent Injunctions in Patent Infringement Cases Under the Proposed Patent Reform Act of 2005 and* eBay v. Mercexchange, 17 CORNELL J.L. & PUB. POL'Y 431, 438 (2008) ("Most patent trolling behavior thrives on the inequities of enforcing patent rights without contributing anything to either the invention or production of new technologies."); Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 1993 (2007) ("[T]he threat of an injunction can enable a patent holder to negotiate royalties far in excess of the patent holder's true economic contribution. Such royalty overcharges act as a tax on new products incorporating the patented technology, thereby impeding rather than promoting innovation."); Jason Kirby, *Patent Troll or Producer?*, FIN. POST (Jan. 14, 2006), http://www.financial post.com/story.html?id=1509d361-0144-4432-b6dc-2c14026c98d6 ("Companies who do the costly grunt work of actually developing and marketing new technologies are being held ransom by tiny outfits whose only assets are 'kooky and vague' patents . . . ."); Joe Beyers, *Rise of the Patent Trolls*, CNET (Apr. 2, 2007), https://www.cnet.com/news/rise-of-the-patent-trolls ("[Patent Trolls] seek to quietly acquire significant patent portfolios with the intent of threatening lengthy and costly patent infringement lawsuits against operating companies."); Maggie Shiels, *Technology Industry Hits Out at 'Patent Trolls,'* BBC (June 2, 2004), http://news.bbc.co.uk/2/hi/business/3722

Despite early beginnings in design patents, current literature largely leaves design patents out of the discussion surrounding NPE litigation.[116] Currently, there are no studies focused solely on NPE litigation of design patents. Others have conducted empirical studies with datasets containing design-patent suits, but these studies do not adequately describe trends in design-patent litigation. In 2018, for every design patent issued, approximately ten utility patents were issued.[117] Considering the high ratio of utility-patent suits to design-patent suits, it is impossible to glean knowledge solely describing design-patent litigation from these studies—especially when they present their results without distinguishing between utility and design suits.

Sara Jeruss, Robin Feldman, and Joshua Walker conducted an empirical study on 100 patent-infringement cases filed each year between 2007 and 2011.[118] There is no indication that they made any differentiation between utility- and design-patent suits. Jeruss, Feldman, and Walker found that NPE litigation increased significantly while suits filed by product companies decreased.[119] In a follow-up study, Feldman, Thomas Ewing, and Jeruss expanded their dataset to all litigated patents, including design patents, in 2007,

509.stm ("An added problem is the growth of so called 'patent trolls' who can be likened to modern day highway robbers . . . .").

NPEs, however, are not without supporters. Others argue that NPEs provide capital to individual inventors, thus creating a market for innovation. *See* Shrestha, *supra*, at 129 ("NPEs could therefore identify and reward promising independent inventors and encourage them to make other discoveries."); Spencer Hosie, *Patent Trolls and the New Tort Reform: A Practitioner's Perspective*, 4 I/S: J.L. & POL'Y FOR INFO. SOC'Y, 75, 78–86 (2008) (challenging "myths" about patent trolling); James F. McDonough III, Comment, *The Myth of the Patent Troll: An Alternative View of the Function of Patent Dealers in an Idea Economy*, 56 EMORY L.J. 189, 190 (2006) ("Patent trolls provide liquidity, market clearing, and increased efficiency to the patent markets—the same benefits securities dealers supply capital markets."); Marc Morgan, Comment, *Stop Looking Under the Bridge for Imaginary Creatures: A Comment Examining Who Really Deserves the Title* Patent Troll, 17 FED. CIR. B.J. 165, 165 (2008) ("Many legitimate businesses play a positive role by encouraging innovation, increasing liquidity, and providing market clearing." (footnote omitted)).

116. For example, Lauren Cohen, Umit Gurun, and Scott Kominers performed an empirical study on all NPE lawsuits since 1977. *See* Cohen et al., *supra* note 115, at 5464. Cohen, Gurun, and Kominers obtained litigation data from RPX Corporation, a company that collects information on NPEs. *Id.* The RPX Corporation collects data on utility- and design-patent suits alike. However, Cohen, Gurun, and Kominers replicated their own analysis for 2010 and 2012 with data collected by Christopher A. Cotropia, Kesan, and Schwartz in 2014. *Id.*; *see also Unpacking PAEs*, *supra* note 113. The data used to replicate results, however, did not contain any design-patent suits. *See Unpacking PAEs*, *supra* note 113, at 665 (conducting a study that "excluded all cases in which the only patents asserted were design patents"). This suggests that Cohen, Gurun, and Kominers's results do not describe design-patent litigation because they were replicated using data that does not include design-patent suits.

117. In 2018, 29,441 design patents and 306,909 utility patents were issued. U.S. PAT. & TRADEMARK OFF., FY 2018: PERFORMANCE AND ACCOUNTABILITY REPORT 178 (2019). The ratio of utility patents issued to design patents issued has stayed relatively constant from 2014 to 2018. *Id.*

118. Sara Jeruss, Robin Feldman & Joshua Walker, *The America Invents Act 500: Effects of Patent Monetization Entities on US Litigation*, 11 DUKE L. & TECH. REV. 357, 365 (2013).

119. *Id.* at 361.

2008, 2011, and 2012.[120] Feldman, Ewing, and Jeruss again found that there has been an increase in NPE litigation and that the top ten parties who filed the largest number of infringement suits were NPEs.[121] Feldman, Ewing, and Jeruss made no distinction between design or utility-patent suits in the presentation of their results. In Ball and Kesan's previously discussed empirical study, they included design-patent suits and did not find evidence that NPEs pose a serious problem in patent litigation because they are generally small entities and sue similarly sized parties.[122] Although design patents were included, Ball and Kesan did not present separate results for utility and design patents with regards to NPE litigation. We cannot glean any trends on NPE design-patent litigation from these studies.

Much like the literature on patent litigation as a whole, several studies on NPE litigation expressly eliminated design-patent cases by study design or conscious choice.[123] These studies suggest a teaching away from including design patents in empirical studies on patent litigation. Christopher Cotropia, Kesan, and Schwartz conducted an empirical study on the nature of utility-patent litigants within the broad NPE classification.[124] Cotropia, Kesan, and Schwartz found that there has not been an explosion of NPE litigation between 2010 and 2012, in contrast with what others had reported.[125] Allison, Lemley, and Schwartz performed an empirical study aimed at determining who wins in utility-patent litigation.[126] Allison, Lemley, and Schwartz found that product companies fared better in litigation than NPEs.[127] Sannu Shrestha conducted an empirical study on NPE-owned-and-litigated patents to determine whether NPEs encourage or discourage innovation.[128] Shrestha

120. *AIA 500 Expanded*, *supra* note 113, at 21 ("This entailed collecting information on almost 13,000 unique patent records for patents of all types (utility, design, plant, and reissue) from a dataset that contained almost 30,000 total patent records.").

121. *Id.* at 58.

122. Ball & Kesan, *supra* note 90, at 18.

123. *Unpacking PAEs*, *supra* note 113, at 665 (conducting a study that "excluded all cases in which the only patents asserted were design patents"); *NPEs Win Patent Suits*, *supra* note 102, at 246 (excluding all "allegations of design . . . patent infringement"); *see also* Chien, *supra* note 21, at 1595 nn.139–41 (limiting study to only high-tech patent suits with no design-patent classifications included); 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, 33–37 (2009) [hereinafter *Trolls on Top*] (listing the 106 most litigated patents and none were design patents); Shrestha, *supra* note 115, at 143, 151 ("This Note's database of NPE-owned patents was constructed by first searching the IPLC for every patent infringement lawsuit filed by fifty-one NPEs and then gathering the patent numbers from the complaints in those lawsuits." (footnote omitted)) (containing no design-patent classifications); Risch, *supra* note 113, at 475–76 (the top eleven classifications of patents studied were not design-patent classifications).

124. *See Unpacking PAEs*, *supra* note 113, at 651.

125. *See id.* at 655.

126. *NPEs Win Patent Suits*, *supra* note 102, at 244.

127. *Id.* at 274.

128. Shrestha, *supra* note 115, at 117.

found that NPEs hold high value utility patents.[129] Michael Risch performed an empirical study on the top ten most litigious NPEs.[130] Risch found that NPE utility patents are held by many different types of entities and represent many different industries.[131] Allison, Lemley, and Walker conducted an empirical study on the most litigated utility patents, or those that were asserted at least eight times, between 2000 and 2007.[132] Allison, Lemley, and Walker discovered that NPEs represent the majority of suits involving the most litigated patents.[133] Finally, in Chien's previously discussed study, she determined how often NPEs bring patent litigation suits.[134] Chien found that NPEs bring a minority of high-tech patent-infringement suits.[135] None of these studies shed light on NPE activity in design-patent litigation simply because they do not include any design-patent suits.

III. STUDY DESIGN AND METHODOLOGY

This Article utilizes the Stanford Non-Practicing Entity (NPE) Litigation Dataset. From the Stanford NPE Litigation Dataset, a dataset of recent design-patent cases was created. A summary of how the dataset was used to determine patent-asserter and accused-infringer entity size, and subsequently a categorization of the matchup between the parties, is set forth in Part II.A. A summary of how the dataset, along with outside information retrieved from Patent Office databases, was used to determine the classification of each asserted design patent is provided in Part II.B. We then briefly discuss potential limitations of the study in Part II.C.

The Stanford NPE Litigation Dataset is a publicly available database that tracks patent owner status in patent litigation from 2000 until 2017.[136] Stanford law students coded every patent plaintiff to determine whether the patent owner was from a closed list of categories such as product company, university, individual, and acquired patent.[137] The Stanford NPE Litigation Dataset

129. *Id.* at 150.

130. Risch, *supra* note 113, at 467.

131. *Id.* at 498.

132. *Trolls on Top*, *supra* note 123, at 5.

133. *Id.* at 32.

134. *See* Chien, *supra* note 21, at 1571.

135. *Id.* at 1571–72.

136. For more information about the Stanford NPE Litigation Database, see *Stanford NPE Litigation Database*, STAN. L. SCH. L. & POL'Y LAB, https://law.stanford.edu/projects/stanford-npe-litigation-database (last visited Oct. 4, 2020).

137. The Stanford NPE Litigation Database categorizes patent asserters as a specific type of NPE or a practicing entity. NPE categories include: (1) acquired patents; (2) university heritage or tie; (3) failed startup; (4) corporate heritage; (5) individual-inventor-started company; (6) university/government/nonprofit; (7) startup, preproduct; (8) individual; (9) undetermined; (10) industry consortium; (11) IP subsidiary of product company; and (12) corporate-inventor-started company. Miller et al., *supra* note 108, at 244.

consists of, for each case: (1) the case title; (2) the civil-action number; (3) the venue; (4) the filing date; (5) whether it was a declaratory judgment suit; (6) the asserted patent numbers; (7) the alleged infringer(s); (8) the patent asserter(s); and (9) an assigned category for the patent asserter(s).[138] Overall, the Stanford NPE Litigation Dataset contained 66,260 entries from 46,702 distinct[139] district-court patent-infringement lawsuits, including declaratory-judgment suits for noninfringement, filed from January 1, 2000 to December 31, 2016.[140]

This Article limits the Stanford NPE Litigation Dataset to cases where the patent, or patents, asserted included at least one design patent. Design-patent numbers begin with either the letter "D" or "Des," depending on the age of the patent. To identify design patents in litigation within the Stanford NPE Litigation Dataset, the letter "D" was searched for in the column listing asserted patent numbers for each case.[141] The dataset contained 3,368 unique cases that included at least one asserted design patent.

A. Identification of Entity Size

To develop a profile of litigation behavior in design-patent cases, the size of the patent asserters and accused infringers were determined based on annual revenue data. For this analysis, the Stanford NPE Litigation Dataset was further narrowed to eliminate any case filed before January 1, 2006.[142] The cutoff point of January 1, 2006, allowed for ten of the most recent years of patent litigation

No case title, civil-action number, venue, filing date, declaratory judgment classification, asserted patent number(s), alleged infringer(s), or patent asserter(s) were missing from the Stanford NPE Litigation Dataset. However, not all patent asserters were assigned a category. Out of 4,298 unique patent asserters, 712 were missing a categorization. *See Stanford NPE Litigation Database*, *supra* note 136.

138. *See Stanford NPE Litigation Database*, *supra* note 136.

139. For cases where there were multiple types of patent asserters, the Stanford NPE Litigation Dataset includes duplicates of the same case. Miller et al., *supra* note 108, at 246. In other words, the dataset contains multiple rows where all information matches, other than the patent-asserter category. We removed all duplicate rows where the civil-action number matched another row with the "remove duplicates" function in excel. Before removing duplicates, the dataset contained 4,299 cases including at least one design patent and 3,410 cases including at least one design patent and filed on or after January 1, 2006. *Stanford NPE Litigation Database*, *supra* note 136. Removing duplicates should not cause us to lose any data about asserter size.

140. We recognize that the *Apple v. Samsung* case occurred later in the time period of our study. Apple v. Samsung Elecs. Co., No. 11-CV-01846-LHK, 2011 WL 7036077, at *2 (N.D. Cal. Dec. 2, 2011), *aff'd*, 678 F.3d 1314 (Fed. Cir. 2012) (The district court case was filed on April 15, 2011.). It is certainly possible that the publicity surrounding the Apple case altered firm and lawyer behavior with respect to obtaining and enforcing design patents. Unfortunately, the available data prohibits us from exploring this interesting possibility in this Article.

141. This search method would also produce any design-patent numbers beginning with "Des.," instead of "D." However, there were no such instances of this in the Stanford NPE Litigation Dataset. *See Stanford NPE Litigation Database*, *supra* note 136.

142. Prior to that time, only some of the dockets from patent-infringement lawsuits were available in electronic format. *See* Jason Rantanen, *Recalibrating Our Empirical Understanding of Inequitable Conduct,* 3 IP THEORY 98, 104–05 (2013). Because we believe that the Stanford researchers did handle collected paper dockets from earlier times, we decided to exclude these earlier years to reduce the risk of bias in the data.

data. The dataset contained 2,672 unique cases that included at least one design patent and were filed on or after January 1, 2006. Because it was time consuming to identify the size of the litigants, it was not practical to perform the analysis for the full population of design-patent litigation. To obtain a meaningful estimate, a random sample of 500 design-patent cases was selected from the population of 2,672 design-patent cases.

For each case, the size of each patent asserter and accused infringer was determined. Many cases in the design-patent database had multiple patent asserters and multiple accused infringers. For cases where there were multiple distinct patent asserters, this Article assumed that all patent asserters were making decisions in concert and, thus, we only considered the patent asserter with the largest annual revenue.[143] For cases where there were multiple accused infringers, any accused infringer was eliminated who: (1) was apparently included to make sure the correct name was cited in the complaint;[144] (2) was a subsidiary of another named accused infringer; or (3) was an individual who was a sole or majority owner of small companies, unless multiple individual owners were sued. For cases where multiple accused infringers remained after elimination, each accused infringer was classified individually. The size of 500 patent asserters and 663 accused infringers was determined for a total of 1,163 parties.[145]

Each party was coded as small, medium, or large based on revenue data as available. Companies with annual revenues of less than or equal to $10 million were classified as small.[146] Companies with annual revenues of more than $10 million, but less than or equal to $100 million, were classified as medium.

143. One hundred twenty-eight cases in the random sample included more than one patent asserter. This was a particular issue for declaratory judgment suits where the patent asserter was named as the accused infringer on the complaint. For these cases, any patent asserter who was included to make sure the correct name was cited in the complaint (i.e., Inc. vs. Corp.) was eliminated. From there, each patent asserter was searched in LexisNexis, Orbis, and PrivCo, and the patent asserter with the largest revenue was selected. *See* LEXISNEXIS, CORPORATE AFFILIATIONS (2020), http://www.corporateaffiliations.com; ORBIS (2020), https://www.bvdinfo.com/en-us/our-products/data/international/orbis; PRIVCO (2020), https://www.privco.com.

144. When multiple parties had identical root names, we only counted one of the parties. For example, in *Luv N' Care, Ltd. v. HEB Grocery Co.*, No. 2:12-cv-00204-JRG-RSP, 2012 WL 11921570 (E.D. Tex. July 13, 2012), the named accused infringers were: HEBCO GP, L.L.C.; HEB Grocery Company, LP; and HEBCO, GP LLP. Each name is a variation on HEB, so all accused infringers were eliminated except HEB Grocery Company, LP because this was the only correct variation (the only one that actually existed). *Id.* Others have used a similar approach. See Christopher A. Cotropia, Jay P. Kesan & David L. Schwartz, *Heterogeneity Among Patent Plaintiffs: An Empirical Examination of Case Progression, Settlement, and Adjudication*, 15 J. EMPIRICAL L. STUD. 80, 99 (2018) (collapsing related defendants for counting purposes).

145. Through the elimination process, more than 500 patent asserters were coded by annual revenue. However, only the patent asserter with the largest revenue was officially categorized by size.

146. Chien, *supra* note 21, at 1597 ("The $10 million threshold is based on values published by the Small Business Administration and previous empirical research, and the $100 million threshold is based on a calculation performed on high-tech Russell 3000® companies." (footnote omitted)).

Companies with annual revenues of more than $100 million were classified as large.[147]

Annual revenue for each party was located on three different sources.[148] First, each party was searched in the Corporate Affiliations database available through LexisNexis, which provides data on public and private companies.[149] LexisNexis Corporate Affiliations' content includes historical company profiles with corporate families, executive and director bios, and parent and subsidiary company profiles.[150] For parties whose annual revenue data was not available on the Corporate Affiliations database, each party was searched on Orbis.[151] Orbis provides public and private company data, including projected financials, news, and corporate ownership structures globally and domestically.[152] For parties whose annual revenue data was not available on the Corporate Affiliations database or Orbis, each party was searched on PrivCo.[153] PrivCo provides financial and business data, news, and media content on major private companies globally.[154] If no annual revenue data was found on any of the three sources, it was assumed that the party should be classified as small.[155] Finally, all parties who were individuals were classified as small.[156]

Annual revenue data across each source was tested for consistency through a random sample of thirty-seven design-patent cases. For this smaller sample, annual revenue data was obtained from each of the three sources for each patent asserter and accused infringer. Out of the eighty-one patent asserters and accused infringers, annual revenue data was not available on LexisNexis Corporate Affiliations for thirty-nine, on Orbis for thirty-two, and on PrivCo for sixty-eight. Thirty-six parties had revenue data available from at least two of the three sources.

In some cases, the classification of a party would not differ depending on the source used to determine annual revenue. For the thirty-six parties who had

147. *Id.* Some studies code companies with revenue under $1 billion as small or medium and over $1 billion as large. *See* James Bessen & Michael J. Meurer, *The Direct Costs from NPE Disputes*, 99 CORNELL L. REV. 387, 398 (2014).

148. Annual revenue for each party was from the latest year available on the source. None of the three sources (LexisNexis, Orbis, or PrivCo) consistently provided annual revenue for the year the case was filed. For example, the only consistent annual revenue data available on Orbis was 2017.

149. Annual revenue was located on LexisNexis Corporate Affiliations for 502 parties (out of the 1,163 parties).

150. For more information on the LexisNexis Corporate Affiliations online database, see LEXISNEXIS, *supra* note 143.

151. Annual revenue was located on Orbis for 279 parties.

152. For more information on Orbis, see ORBIS, *supra* note 143.

153. Annual revenue was located on PrivCo for thirty-one parties.

154. For more information on PrivCo, see PRIVCO, *supra* note 143.

155. One hundred nine parties were assumed to be small because there was no annual revenue data available on LexisNexis, Orbis, or PrivCo.

156. Fifty-nine parties were individuals.

revenue data from at least two of the three sources, each available source had annual revenue resulting in the same entity size for twenty-seven parties.[157] However, in other cases, the classification of a party would have differed if Orbis or PrivCo was the first source used to determine annual revenue. Where LexisNexis data was available, LexisNexis was the highest revenue data for two parties and the lowest for six parties. Where Orbis data was available, Orbis was the highest revenue data for five parties and the lowest for four parties. Where PrivCo data was available, PrivCo was the highest revenue data for six parties and the lowest for zero parties. From this, it can be speculated that, on average, LexisNexis annual revenue is a low estimate, and PrivCo annual revenue is a high estimate.[158] These inconsistencies may be due to the methodology of data collection used in LexisNexis, Orbis, and PrivCo. They may also be due to the differing years for which annual revenue is available from each source.[159]

A categorization was assigned to each case based on the size of the patent asserter and accused infringer in each case. If the Stanford NPE Litigation Dataset categorized the patent asserter as an NPE, then the case was given an NPE categorization no matter what the size of the patent asserter and accused infringer was.[160] For cases where there were multiple accused infringers, multiple categorizations were assigned.

157. For example, Johnsonville Sausage (4121): Lexis—400M–450M (2018), Orbis—750M (2017), PrivCo—1.1B (2017). *See* LEXISNEXIS, *supra* note 143 (search "Johnsonville Sausage"); ORBIS, *supra* note 143 (search "Johnsonville Sausage"); PRIVCO, *supra* note 143 (search "Johnsonville Sausage").

158. For example, GOJO Industries (2510): Lexis—83.3M (2018), Orbis—350M (2017), PrivCo—286M (2017). *See* LEXISNEXIS, *supra* note 143 (search "GOJO Industries"); ORBIS, *supra* note 143 (search "GOJO Industries"); PRIVCO, *supra* note 143 (search "GOJO Industries").

159. LexisNexis had more recent annual revenue data (2019), while Orbis and PrivCo rarely had annual revenue data from any year more recent than 2017. *See* LEXISNEXIS, *supra* note 143; ORBIS, *supra* note 143; PRIVCO, *supra* note 143.

160. The following cases, included in the random sample of 500 design-patent cases, have more than one patent asserter, where at least one was an individual and at least one was a practicing entity. The Stanford NPE Litigation Dataset coded these cases twice, once for the individual (NPE) and once for the practicing entity. For the purposes of this study, each of these cases was not considered an NPE case. Instead, the case was categorized based on the annual revenue of the practicing entity patent asserter, rather than NPE litigation. *Stanford NPE Litigation Database*, *supra* note 136.

- Foose v. CIA Wheel Grp., No. 2:07-cv-03665-SJO-VBKx, 2007 WL 2321002 (C.D. Cal. June 27, 2007).
- Corsage Collection, Inc. v. GN Diamond, LLC, No. 06-382, 2011 WL 1532361 (E.D. Pa. Apr. 21, 2011).
- P.S. Prods. v. Mini Gadgets Inc., No. 4:11-CV-00532, 2011 WL 2670339 (E.D. Ark. Sept. 9, 2020).
- Parallax Grp. Int'l v. Multy Indus., No. 2:08-cv-07260 (C.D. Cal. Feb. 23, 2009).
- Kauer v. Nostalgia Prods. Grp., No. 3:11-cv-330, 2012 WL 3812769 (W.D.N.C. June 4, 2012).
- Opteka, Inc. v. JCL Custom Prods., No. CV12-2759, 2012 WL 2117526 (E.D.N.Y. June 1, 2012).
- Wrench, Inc. v. Big Bear Am. Made Choppers, Inc., No. 8:07-CV-00794, 2007 WL 5123967 (M.D. Fla. July 17, 2007).
- P.S. Prods. v. iOffer, Inc., No. C12-4933, 2012 WL 4485769 (N.D. Cal. Sept. 20, 2012).
- P.S. Prods. v. SSW Co., No. 4:14CV00289-BSM, 2014 WL 1997936 (E.D. Ark. May 12, 2014).
- Jedlicka v. Tee-Zed Prods., No. 3:15-cv-1882-M, 2015 WL 9907650 (N.D. Tex. Nov. 5, 2015).

B. Classification

To understand the industries in which design-patent litigation is centered, the classification of each asserted design patent was obtained. U.S. design patents are classified "based on the concept of function or intended use of the industrial design disclosed and claimed."[161] There are thirty-three classes of subject matter for design patents, ranging from D01 to D99.[162] Each design class is organized into subclasses.[163] For the purpose of this study, subclasses were not considered in the analysis.

For this analysis, the USPTO Patent Examination Research Dataset (Public PAIR) was used to retrieve the Patent Office Classification Codes for each asserted design patent in the design-patent database.[164] Each patent number was matched with its entry in the USPTO Patent Examination Research Dataset (Public PAIR) and the corresponding Patent Office Classification Code was recorded in the design-patent database. For cases where several different design patents were asserted in one suit, the classification code for each design patent was recorded.

Eighteen design-patent numbers from the design-patent cases in the Stanford NPE Litigation Dataset were not in the USPTO Patent Examination Research Dataset (Public PAIR) or were incorrectly classified in the USPTO Patent Examination Research Dataset (Public PAIR).[165]

• Ameristar Fence Prods. v. SBI Sols. Buy Imps., No. 3-06CV1380-P, 2006 WL 2376145 (N.D. Tex. Aug. 1, 2006).

• SwimWays Corp. v. Aqua-Leisure Indus., No. 3:12cv00205, 2013 WL 12322095 (E.D. Va. Oct. 23, 2013).

• Int'l Seaway Trading Corp. v. Walgreens Corp., 599 F. Supp. 2d 1307 (S.D. Fla. 2009).

• New Castle Beverage Inc. v. Premier Foods, LLC, No. CV13-02055, 2013 WL 1285700 (C.D. Cal. Mar. 21, 2013).

• Carlini Enters. v. Binford, No. SACV13-01023JST(ANx), 2013 WL 3818641 (C.D. Cal. July 9, 2013).

161. *Classification of Design Patents*, U.S. PAT. & TRADEMARK OFF., at sec. B, https://www.uspto.gov/patent/laws-and-regulations/examination-policy/seven-classification-design-patents (last visited Jan. 2, 2020).

162. *Id.* at sec. C ("U.S. Design patents are classified into 33 classes of subject matter . . . .").

163. *Id.* at sec. C.1 ("Each Design class is organized into subclasses to permit efficient searching for specific types of industrial designs.").

164. Stuart J.H. Graham, Alan C. Marco & Richard Miller, *The USPTO Patent Examination Research Dataset: A Window on the Process of Patent Examination* (U.S. Pat. & Trademark Off., Working Paper No. 2015-4, 2015), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2702637; *Patent Examination Research Dataset (Public PAIR)*, U.S. PAT. & TRADEMARK OFF. (2019), https://www.uspto.gov/learning-and-resources/electronic-data-products/patent-examination-research-dataset-public-pair.

165. Design-patent numbers were incorrectly classified in the USPTO Patent Examination Research Dataset (Public PAIR) when the classification did not match any actual design-patent classification. For example, a design-patent number in the USPTO Patent Examination Research Dataset (Public PAIR) that was classified as "999" is incorrect because that is not an actual classification number for design patents. *See* U.S. PAT. & TRADEMARK OFF., *supra* note 164, at sec. C. For design-patent numbers that were missing, the number search in the USPTO Patent Full-Text and Image Database was used to manually enter the classification code into the design patent-database. *See* U.S. PAT. & TRADEMARK OFF., PATENT FULL-TEXT AND IMAGE DATABASE (2020), http://patft.uspto.gov/netahtml/PTO/srchnum.htm. The same procedure

C. Limitations

Before continuing to the results of the study, it is important to be upfront about limitations. The study includes all patent litigation lawsuits that we could identify involving design patents over a set time period. It includes cases that were filed and consequently settled. The study also includes cases that were litigated to judgment, either on the merits or on a procedural issue (i.e., the case was dismissed for lack of personal jurisdiction over the defendant). Studies focusing on litigation outcomes are subject to concerns about selection, with a law-and-economics theory positing that only the closest cases reach a trial.[166]

Under that theory, often called the Priest-Klein theory, the easier cases settle, leaving only the hard ones for trial.[167] That results in a skewed dataset that will always converge around a fifty percent trial win rate.[168] Our study includes cases that settled, went to trial, and were resolved by the court on other grounds. Thus, some of the classic objections to litigation studies are not applicable to our study.

However, we acknowledge that lawsuits do not represent the full universe of design-patent disputes. Some disputes are raised and either settled or dropped without court intervention. We have no means to evaluate the quantity or effect of cease and desist letters sent by design-patent holders. This correspondence between private parties is confidential and not available to research in all but the rarest of circumstances. Our empirical results about litigation should be understood with these limitations in mind.

IV. RESULTS

To recap, we combined data from three sources about design-patent litigation. We extracted a variety of information about design-patent litigations

was used to fill in classification codes for design-patent numbers from the design-patent database that were incorrectly coded in the USPTO Patent Examination Research Dataset (Public PAIR).

166. *See* George L. Priest & Benjamin Klein, *The Selection of Disputes for Litigation*, 13 J. LEGAL STUD. 1, 15 (1984).

167. *Id.* 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. Iowa Legal Stud., 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); John R. Allison, Mark A Lemley & David L. Schwartz, *Our Divided Patent System*, 82 U. CHI. L. REV. 1073, 1126–27 (2015).

168. Allison et al., *Our Divided Patent System*, *supra* note 101, at 1073.

> 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 percent win rate can be caused by a variety of factors . . . including asymmetric stakes, costs, and risk profiles; agency costs; endowment effects; and other complicating factors.

Id. (citing Kevin M. Clermont, *Litigation Realities Redux*, 84 NOTRE DAME L. REV. 1919, 1951–56 (2009); Kevin M. Clermont & Theodore Eisenberg, *Litigation Realities*, 88 CORNELL L. REV. 119, 137–40 (2002); Daniel P. 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)).

from the Stanford NPE Litigation Database, merged in patent classification information from a Patent Office dataset, and supplemented the database with hand-gathered data about entity size. In this Part, we set forth the results of the present study. Part IV.A discusses various observations on design-patent litigation gathered from data present in the Stanford NPE Litigation Dataset, including largest venues, number of parties, number of asserted patents, and types of patent-asserting entities. Part IV.B discusses a litigation profile for design-patent cases based on the size of each named party in the case. Finally, Part IV.C discusses a litigation profile for design-patent cases based on industries represented by asserted patents.

A. Quantity of Design-Patent Litigation and Plaintiff Entity Type

As previously discussed, we utilized the Stanford NPE Litigation Dataset that included 66,260 entries for cases filed between 2000 and 2016. We manually removed cases only asserting utility patents and duplicate cases. This left 3,368 unique design-patent cases filed between 2000 and 2016. These cases constitute the design-patent cases analyzed further in this study.

The distribution of unique filings by type of patent asserted for 2000 to 2016 is set forth in Table 1 below.

Table 1:
Utility- and Design-Patent Cases (2000–2016)

	Design	Utility and Design	Utility
Total Cases % (#)	4.44 (2,427)	1.72 (941)	93.83 (51,241)
Average Number of Named Accused Infringers	2.08	2.20	2.07[169]
Average Number of Patents Asserted	1.92	4.22	2.38[170]

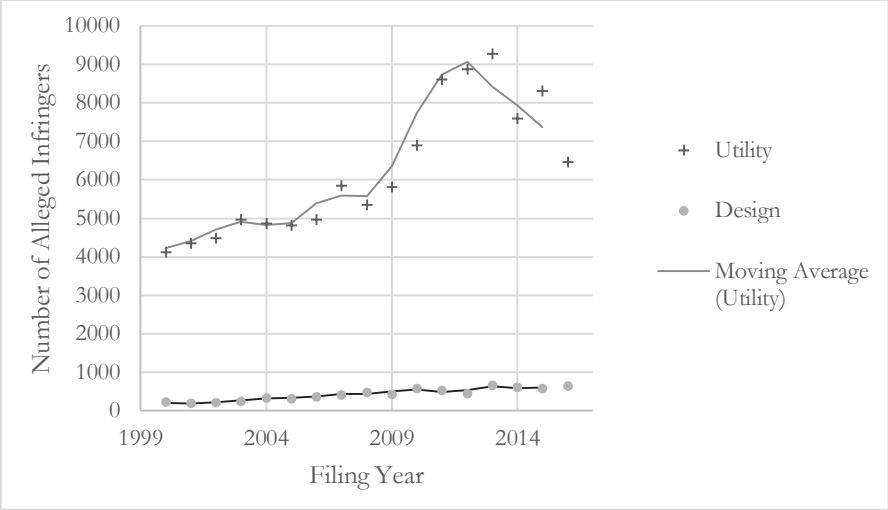
The vast majority, 93.83%, of patent litigation cases are utility-patent cases. Cases where only design patents are asserted represent only 4.44% of patent litigation cases. Even fewer, at 1.72% of patent litigation cases, are those where design and utility patents are asserted.

169. Some entries in the Stanford NPE Litigation Dataset did not list asserted patent numbers for the corresponding cases. Those 8,289 cases were assumed to be utility-patent cases in all other calculations. These cases were not included in the calculation for average number of named accused infringers per case.

170. The 8,289 entries in the Stanford NPE Litigation Dataset that did not list asserted patent numbers for the corresponding cases were assumed to be utility-patent cases in all other calculations. These cases were not included in the calculation for average number of patents asserted per case.

Figure 1 sets forth the trend of the number of alleged infringers in utility- and design-patent complaints between 2000 and 2016 by the number of alleged infringers.

Figure 1:
Number of Alleged Infringers by Year (2000–2016)[171]



The total number of alleged utility-patent infringers increased from 2000 to 2016 from 4,109 to 6,454. The total number of alleged design-patent infringers is smaller than utility patents, but it has also increased between 2000 to 2016 from 223 to 632. Comparatively, the percent increase in design-patent cases is much higher than that of utility-patent cases. While both utility- and design-patent cases increased from 2000 to 2016, utility-patent alleged infringers sharply increased between 2010 and 2011 and dropped from 2013 to 2016, while design-patent alleged infringers steadily increased. Thus, the number of design-patent alleged infringers is more constant, while the number is less stable and less predictable for utility patents.

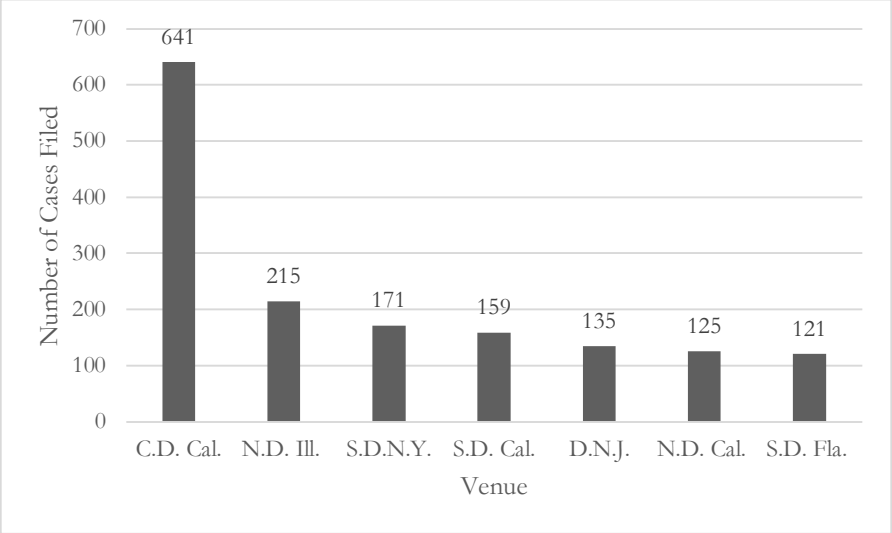
Cases against these alleged infringers span across judicial districts. The federal judiciary system includes ninety-four federal judicial districts,[172] but, although each district can adjudicate patent litigation cases, the cases are not

171. Design-patent data in Figure 1 represents alleged infringers in cases where only design patents were asserted and in cases where design and utility patents were asserted. A breakdown by design-only and design-and-utility combination cases can be found in Appendix A. The data shown in Figure 1 aligns with data previously presented by Matthew Sag. *See* Matthew Sag, *IP Litigation in U.S. District Courts: 1994 to 2014*, 101 IOWA L. REV. 1065, 1083 (2016). Sag's figures are larger than those presented in Figure 1, but it is likely due to the fact that Sag's figures combine utility- and design-patent filings, while Figure 1 does not.

172. *Court Role and Structure*, U.S. COURTS, https://www.uscourts.gov/about-federal-courts/court-role-and-structure (last visited Oct. 4, 2020).

evenly distributed. In design-patent litigation, the Central District of California has proven to attract the most cases, followed by the Northern District of Illinois, the Southern District of New York, and the Southern District of California. The 54,609 utility- and design-patent cases analyzed in this study were filed in every active district court and territorial court. Figure 2 below shows a representation of the venues with the highest design-patent filings between 2000 and 2016.

Figure 2:
Largest Districts for Design-Patent Litigation (2000–2016)



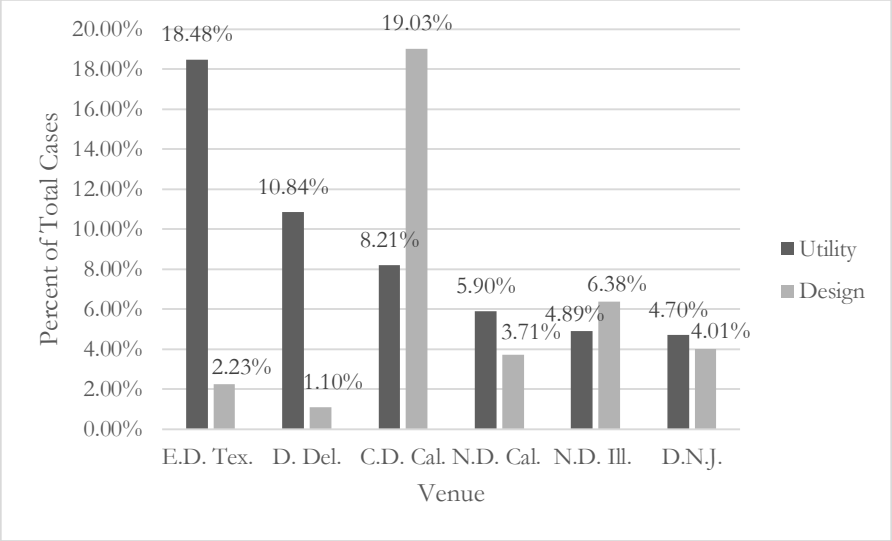
As evident in Figure 2, more design-patent cases are filed in the Central District of California than any other district. Six hundred forty-one design-patent cases were filed in the Central District of California, almost three times as many cases as the next largest venue for design-patent cases, the Northern District of Illinois.[173] For those interested, a breakdown of design-patent cases for each district is included in Appendix B.

The largest venues for design-patent litigation differ from the largest venues for utility-patent litigation. For comparison, in utility-patent litigation, judicial districts such as the Eastern District of Texas, the District of Delaware, the Central District of California, and the Northern District of California have proven to be the most popular. Figure 3 shows a representation of the largest venues for utility-patent cases between 2000 and 2016 as compared to the

173. Two hundred fifteen design-patent cases were filed in the Northern District of Illinois, closely followed by 171 in the Southern District of New York, 159 in the Southern District of California, 135 in the District of New Jersey, 125 in the Northern District of California, and 121 in the Southern District of Florida.

percentage of design-patent cases[174] filed in those venues. The y-axis represents the percentage of the total number of utility-patent or design-patent cases filed between 2010 and 2016 and the x-axis represents the venue.

Figure 3:
Comparison of the Largest Districts for
Utility- and Design-Patent Litigation (2000–2016)



More utility-patent cases are filed in the Eastern District of Texas than in any other district. Approximately 18.48% of utility-patent cases are filed in the Eastern District of Texas, compared to only 2.23% of design-patent cases. The next largest district for utility-patent cases is the District of Delaware, representing 10.84% of utility-patent cases, compared to only 1.10% of design-patent cases. The Central District of California represents 8.21% of utility-patent cases, while it is the largest district for design-patent cases at 19.03%.[175] A high number of practicing entities residing in the Central District of California and a preference for the Eastern District of Texas by NPEs may explain this phenomenon.

174. For the purposes of analyzing venue, all cases where at least one design patent was asserted were considered as design-patent cases, including those that asserted design and utility patents.

175. Between 2010 and 2016, 5.90% of utility-patent cases and 3.71% of design-patent cases were filed in the Northern District of California, 4.89% of utility-patent cases and 6.38% of design-patent cases were filed in the Northern District of Illinois, and 4.70% of utility-patent cases and 4.01% of design-patent cases were filed in the District of New Jersey.

Prior to the *TC Heartland* decision,[176] the Eastern District of Texas attracted over one thousand patent cases every year.[177] Although patent litigation in the Eastern District of Texas remains the top court for patent case filings in 2017, the number of patent cases filed in this district decreased by almost half between 2016 and 2017.[178] Because of the time constraints in the Stanford NPE Litigation Dataset, we do not have sufficient post-*TC Heartland* information about design-patent litigation. Despite the Eastern District of Texas's overall popularity for patent cases before and after *TC Heartland*, the trend does not ring true for design-patent cases. Perhaps the large number of utility-patent cases in the Eastern District of Texas is proportional to the greater number of NPE patent-asserting entities in utility-patent cases. To explore this further, below we discuss the breakdown of patent-asserting entity types in utility- and design-patent litigation.

There are numerous types of PAEs, many of which do not practice the invention in the asserted patent. Entities who do not practice the asserted invention are commonly referred to as NPEs. There are many types of NPEs, ranging from entities who acquired patents, to individual litigants, to IP subsidiaries of product companies.[179] The table below depicts a breakdown of patent-asserting entity (PAE) types for design- and utility-patent litigation from 2000 to 2016.

176. TC Heartland LLC v. Kraft Foods Grp. Brands LLC, 137 S. Ct. 1514, 1517 (2017) (finding that, for the purposes of patent venue, a domestic corporation accused infringer "resides" only in the state in which it is incorporated).

177. *Lex Machina's Fifth Annual Patent Litigation Year in Review Report Quantifies the Impact of the Landmark* TC Heartland v. Kraft *Supreme Court Case*, LEXMACHINA (Feb. 7, 2018), https://lexmachina.com/media/press/lex-machinas-fifth-annual-patent-litigation-year-review-report-quantifies-impact-landmark-tc-heartland-v-kraft-supreme-court-case.

178. *Id.*

179. Miller et al., *supra* note 108, at 244.

Table 2:
Types of Patent-Asserting Entities (2000–2016)[180]

Category [181]	Patent-Asserter Entity Type	Design-Patent Cases % (#)	Utility-and-Design-Patent Cases % (#)	Utility-Patent Cases % (#)[182]
1	Acquired patents	0.60 (15)	1.02 (10)	22.17 (11,439)
5	Individual-inventor-started company	1.52 (38)	1.43 (14)	11.39 (5,878)
8	Product company	73.01 (1,823)	79.37 (777)	47.70 (24,612)
9	Individual	8.65 (216)	5.31 (52)	5.48 (2,830)
0	Uncategorized[183]	15.82 (395)	12.56 (123)	10.36 (5,348)

180. If the percent of cases brought by a type of PAE was less than one, the row was removed. Zero design-patent and utility-and-design-patent cases were filed by: university heritage or tie (2); failed startup (3); corporate heritage (4); startup, pre-product (7); undetermined (10); and industry consortium (11). Less than one percent of utility-patent cases were filed by patent asserters in these categories (0.12%, 0.52%, 0.48%, 0.09%, 0.02%, and 0.05% respectively), and thus, these categories were eliminated from Table 2. In the university/government/nonprofit patent-asserter category (6), 0% of design-patent cases, 0.10% of utility-and-design-patent cases, and 0.81% of utility-patent cases were filed. In the IP subsidiary patent-asserter category (12), 0.36% of design-patent cases, 0.20% of utility-and-design-patent cases, and 0.49% of utility-patent cases were filed. In the corporate-inventor-started company patent-asserter category (13), 0.04% of design-patent cases, 0% of utility-and-design-patent cases, and 0.32% of utility-patent cases were filed. These three categories were also removed from Table 2.

181. The category information is the unaltered information retrieved from the Stanford NPE Litigation Dataset. *See Stanford NPE Litigation Database*, *supra* note 136.

182. The breakdown of PAE types for utility-patent litigation was done by case. Sometimes, in the Stanford NPE Litigation Dataset, the same civil-action number was listed in multiple entries because there were multiple different types of PAEs. We wanted to count each civil-action number once. To do this, we removed duplicate civil-action entries. Within this elimination process, we assumed that any case with at least one practicing entity named as a patent asserter was not an NPE case.

Duplicate entries were removed with the following process: In utility-patent-only litigation, the Stanford NPE Litigation Dataset contained 35,413 entries with the same civil-action number. After removing entries with the same civil-action number and PAE category, 57,987 entries remained. From there, if the case had one PAE that was categorized as a product company (8), all other entries for that case were removed.

Next, we applied a hierarchical set of rules to eliminate the remaining duplicate cases. The hierarchy is as follows: IP subsidiary of a product company (12); university/government/nonprofit (6); university heritage or tie (2); failed startup (3); startup, preproduct (7); corporate-inventor-started company (13); acquired patents (1); corporate heritage (4); individual-inventor-started company (5); industry consortium (11); individual (9); undetermined (10); no category assigned (0). If a case had multiple entries, the entry with the PAE lowest on the aforementioned list was eliminated until no duplicate case entries remained.

At the end of the day, the results collected through elimination of multiple entries generally matched the results published by Miller et al., *supra* note 108, at 243–46. However, here we have a breakdown of PAEs by the type of patent asserted.

183. Many patent asserters were categorized as "0" in the Stanford NPE Litigation Dataset. For the purpose of this study, we considered these as uncategorized cases, separate from category 10 "undetermined" cases. To investigate this category, we hand coded a random sample of 100 cases that were uncategorized in the Stanford NPE Litigation Dataset. Of these, we found that eighty-two plaintiffs were product companies, nine were individual inventors, and one was an inventor-started company. Eight of the plaintiffs were not capable of being readily identified and were likely acquired patents or inventor-started companies.

Each category of PAE, other than "product company" (8), is a unique type of NPE.[184] However, typically, when the term "patent troll" is used, people are generally only referring to acquired patents (1), corporate heritages (4), and individual-inventor-started companies (5).[185] As presented in Table 2, the majority of design-patent-only suits are brought by product companies practicing the invention, at 73.01%. Similarly, 79.37% of design- and utility-patent suits are brought by product companies. Considering the traditional NPE categories, only 0.60% of design patent-only suits were brought by PAEs who acquired the patent, and only 1.52% were brought by individual-inventor-started companies. No design-patent-only cases were brought by corporate heritages. Of cases with design and utility patents, 1.02% were brought by PAEs who acquired the patent, and 1.43% were brought by individual inventor started companies. Again, no design-and-utility-patent cases were brought by corporate heritages.

Notably, design-patent litigation looks different from utility-patent litigation. There has been considerable practitioner, scholarly, and popular press attention paid to patent "trolls" in the past decade.[186] It appears that design-patent litigation, regardless of how those terms are defined, does not include a significant amount of such activity.[187] Instead, the vast majority of design-patent lawsuits are filed by companies that manufacture products.

Why is there little NPE activity involving design patents? We posit that there are two types of utility patents involved in NPE litigation, and both are not available to NPEs for design patents. In the first type, utility patents may be written with an eye toward litigation, sometimes being invented by a patent lawyer.[188] These patents may be intentionally broad, making it challenging for later developers to avoid their scope.[189] The NPE is the original owner of these patents. The second type involves utility patents acquired after issuance, even after a significant amount of infringement has already occurred. Significant prior infringement leads to high potential damages, which is important since most NPEs' primary motivation is monetary damages.[190] Design patents seem unlikely to fall into the first type. Design patents cannot be worded vaguely

184. Miller et al., *supra* note 108, at 244.

185. *Id.*

186. *See supra* Part II.C.

187. Sarah Burstein helpfully pointed me to a more recent (2019) lawsuit brought by an NPE. Sarah Burstein (@design_law), TWITTER (June 25, 2019, 7:00 AM), https://twitter.com/design_law/status/1143489015263485952.

188. Risch, *supra* note 113, at 474 (tracking whether "any sole inventors were licensed attorneys in the home state reported on the patent").

189. *See* Colleen Chien, *Startups and Patent Trolls*, 17 STAN. TECH. L. REV. 461, 476 (2014) (discussing "insanely broad software patents").

190. David L. Schwartz, *The Rise of Contingent Fee Representation in Patent Litigation*, 64 ALA. L. REV. 335, 338–39 (2012) (noting that "patents and the right to recover past damages are freely assignable").

since the claim is primarily the figures.[191] Furthermore, it is believed that most assignees of design patents are large companies. We suspect that few inventors of design patents are patent attorneys.[192] In contrast, there are design patents that potentially fit within the second type. While it may be relatively easy for an infringer to design around a design patent, the past damages may be substantial.[193] As previously discussed, design-patent law includes the heavy remedy of disgorgement of profits.[194] While there may be valuable design patents in this second type, it may be difficult for NPEs to acquire them. The original corporate owners may be unwilling to sell the patents, unlike the failed businesses that are often fodder for utility patents acquired by NPEs.[195] These differences between utility and design patents may explain the lack of significant NPE activity relating to design patents.

B. Entity Size

This Article looks at patent asserter and accused infringer pairs and considers what types of suits were most prevalent. The following categories were assigned dependent on the size of the patent asserter and the accused infringer:[196]

Table 3:
Categorization of Entity Size

Patent-Asserter Size	Accused-Infringer Size	Category
Small or Medium	Small or Medium	Limited Stakes
Medium or Large	Medium or Large	Garden-Variety Competitor Litigation
Large	Small	Predation Profile
Small	Large	David vs. Goliath
Large	Large	Sport of Kings

191. *See supra* Part I.B.

192. We have not empirically investigated the ownership of design patents and cannot definitively rule this out.

193. *Cf.* Brian Moran & Benjamin Jensen, *Designing Around a Patent as an Alternative to a License*, IPWATCHDOG BLOG (July 30, 2019), https://www.ipwatchdog.com/2019/07/30/designing-around-patent-alternative-license/id=111683 (discussing the option that a company can "re-design [its] product or service to avoid infringement").

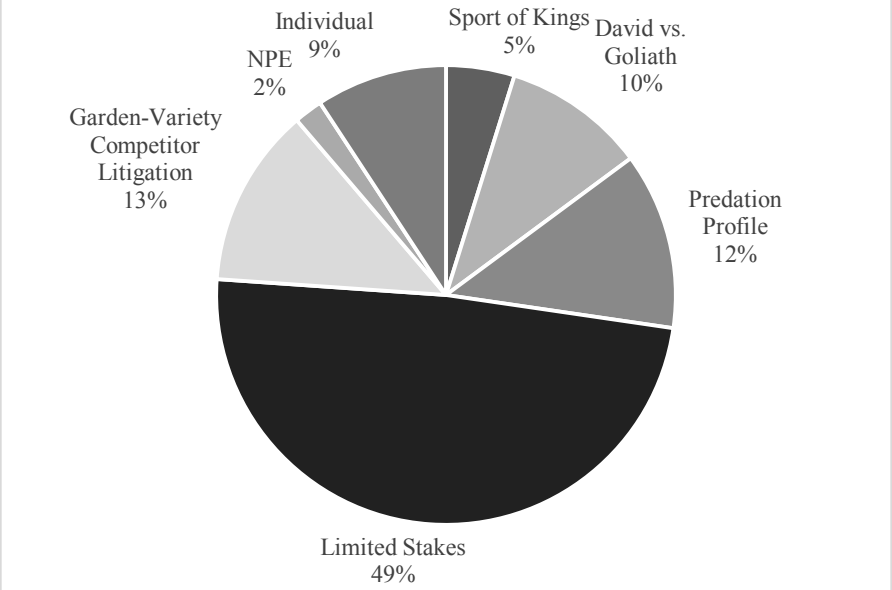
194. 35 U.S.C. § 289 (2018) (an infringer of a design patent "shall be liable to the owner to the extent of his total profit").

195. Risch, *supra* note 113, at 493 (finding that approximately 15% of NPE patents came from failed startups).

196. *See* Chien, *supra* note 21.

Figure 4 shows a representation of entity size in design-patent cases between 2000 and 2016. Only one classification was counted per design-patent case, even if there were multiple accused infringers. For cases where there were multiple accused infringers, the classification with the largest accused infringer was counted. For example, if the case had one small accused infringer and one large accused infringer, the classification corresponding to the relationship between the patent asserter and the larger accused infringer was counted.[197] For those who are interested, further results are included in Appendix C, featuring a different method of counting.

Figure 4:
Entity Size in Design-Patent Cases (2006–2016)[198]



Limited stakes litigation—litigation between either a small or medium patent asserter and a small or medium accused infringer—represents the largest number of design-patent cases at 49%. The next largest categories each represent similar percentages of design-patent cases. Garden-variety competitor litigation represents 13% of design-patent cases, where the patent asserter was either medium or large and the accused infringer was either medium or large.

197. We noted that 433 of the design-patent-infringement cases included John Doe defendants. We considered the non-Doe defendants when assessing entity size. Only a single case included only John Doe defendants: *Yu v. Does*, No. 5:16-CV-04522 (N.D. Cal. dismissed Oct. 17, 2016).

198. Entities that the Stanford NPE Litigation Dataset categorized as NPEs were not classified according to size. Instead, any suit containing at least one NPE was classified as a whole as an NPE suit.

Predation profile represents 12% of design-patent cases, where the patent asserter was large and the accused infringer was small. NPE litigation represents 2% of design-patent cases, where the patent asserter was a type of NPE other than an individual. Litigation by individuals represents 9% of design-patent cases. David vs. Goliath litigation also represents 10% of design-patent cases, where the patent asserter was small and the accused infringer was large. Sport of kings litigation, where both the patent asserter and accused infringer were large, represents the smallest number of design-patent cases at 5%.

Chien's study on high-tech patents presented results with similarities and differences to our results on design-patent litigation with regard to entity size.[199] Chien found that 19% of all high-tech patent suits are brought by NPEs,[200] which is approximately 17% higher than design-patent suits brought by NPEs. Additionally, Chien reported that 16% of high-tech patent litigation was limited stakes [201] compared to this study's finding of 49% in design-patent litigation. David vs. Goliath litigation in high-tech patents and design patents is also different. Chien reported 4% for high-tech patent suits,[202] and this study found 10% for design-patent suits. This data trends toward a finding that more design-patent suits are brought by small or medium size entities, rather than large entities, compared to high-tech patent suits. This is not to say that design-patent suits are not brought by large entities. Chien found that 28% of high-tech patent litigation was sport of kings,[203] versus our finding of 5% in design-patent litigation. However, Chien found that 8% of high-tech patent suits are predation profile,[204] while we found that 12% of design-patent suits are predation profile. Together, this data shows that large entities tend to bring design-patent suits against smaller entities rather than against other large entities.

C. Classification

As previously discussed, the Patent Office Classification Codes for each asserted design patent were retrieved. Figure 5 shows a representation of the largest classifications for asserted design patents in cases where at least one design patent was asserted from 2000 to 2016.

199. *See* Chien, *supra* note 21.

200. *Id.* at 1603.

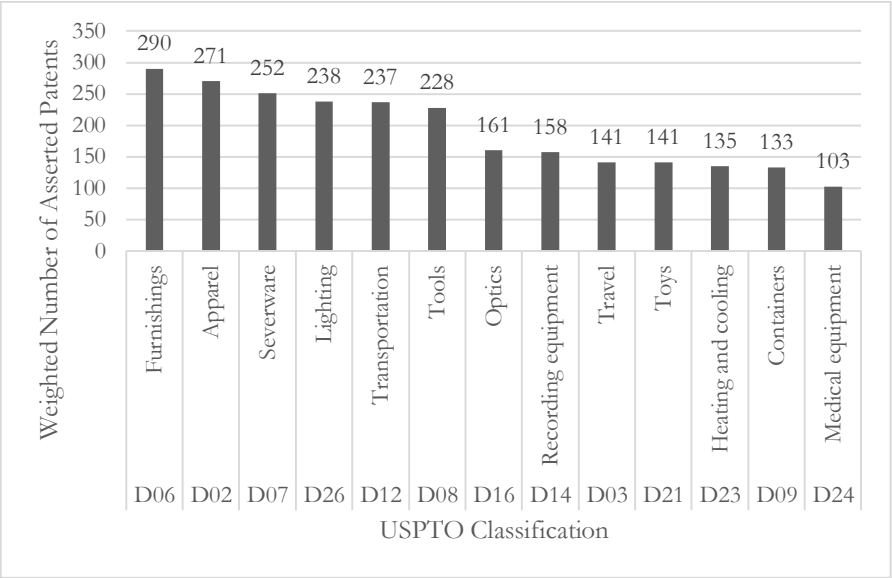
201. *Id.*

202. *Id.*

203. *Id.*

204. *Id.*

Figure 5:
Largest USPTO Classifications for Asserted Design Patents
by Case (2000–2016)



In Figure 5, the x-axis represents an abbreviated definition of the Patent Office design-patent classification, and the y-axis represents the weighted number of patents asserted in that category. In many cases, more than one design patent was asserted. In order to determine the design-patent classification for patents asserted by case, a weight was given to each patent asserted based on the total number of patents asserted per case.[205] A further breakdown of the results for all Patent Office design-patent classifications is included in Appendix B.

The largest classification for asserted design patents is D06, furnishings, with a weighted count of approximately 290. The top asserted patent in this category is D535,507 for a sleigh bed footboard. It is currently assigned to Amini Innovation Corporation. Since its issuance in 2007, it has been asserted six times. The next highest classification for design-patent litigation is D02, apparel and haberdashery, with a weighted count of 271.[206] Apparel and

205. For example, if four patents were asserted in one case, each patent was given a weight of 0.25 (1/4). This ensured that each case was only counted once in the total summation of patents asserted in each USPTO classification category.

206. *See infra* Table 6. Serverware (D07), the next highest classification, had a weighted count of 252. Next, there is lighting (D26) with 238, transportation (D12) with 237, tools (D08) with 228, photography (D16) with 161, recording equipment (D14) with 158, travel (D03) with 141, toys (D21) with 141, heating and cooling (D23) with 135, containers (D09) with 133, and medical equipment (D24) with 103. *See infra* Table 6.

haberdashery includes designs for undergarments, sleepwear, garments, garment protectors, accessories, headwear, footwear, socks, and neckwear.[207] The top asserted patent in this category is D599,999 for a portion of a footwear upper.[208] This patent is the most asserted design patent across all classification categories.

Interestingly, the next highest asserted design patent (D616,189) is also classified under D02.[209] It appears that, while D06 is the category with the highest weighted number of patent assertions, individual patents in other categories are asserted more times. Consider D621,068 ('068) for an architectural panel classified as D25, building and construction units. Despite D25 only being the fifteenth highest classification for asserted design patents, '068 is the third most asserted design patent.[210] This suggests that, while most design patents asserted are classified as D06, there are individual patents in other categories that are asserted in substantially more cases. Therefore, there are particular patent asserters who assert a single patent across a multitude of different cases. Table 4 shows the top ten most asserted design patents between 2000 and 2016 based on the number of patent assertions by civil-action number and the number of alleged infringers sued.

207. *Class D02: Apparel and Haberdashery*, U.S. PAT. & TRADEMARK OFF., https://www.uspto.gov/web/patents/classification/uspcd02/schedd02.htm (last visited Oct. 4, 2020).

208. *See infra* Table 4.

209. *See infra* Table 4.

210. *See infra* Table 4; *see also infra* Table 6.

Table 4:
Top Ten Most Asserted Design Patents (2000–2016)

Patent No.	**Classification**	**Assignee**	**Number of Assertions**	**Number of Alleged Infringers**	**Asserter Category**
D599,999	Apparel (D02)	Deckers Outdoor Corp.	53	124	Product Company
D616,189	Apparel (D02)	Deckers Outdoor Corp.	42	102	Product Company
D621,068	Construction (D25)	3Form, Inc.	20	32	Product Company
D495,939	Tools (D08)	Great Neck Saw Manufacturers, Inc.	17	30	Product Company
D521,850	Tools (D08)	Panavise Products, Inc.	16	23	Product Company
D520,160	Lighting (D26)	Leh Chu Enterprise Co.	15	20	Product Company
D556,818	Optics (D16)	Oakley, Inc.	15	19	Product Company
D554,689	Optics (D16)	Oakley, Inc.	16	17	Product Company
D614,063	Testing Instruments (D10)	Mega Distribution, Inc.	16	17	Product Company
D581,443	Optics (D16)	Oakley, Inc.	15	17	Product Company

As depicted in Table 4, the most asserted design patent between 2000 and 2016 was D599,999, a design patent for a portion of a footwear upper. As depicted in the design patent, the figures appear to depict the shaft of a boot. It is assigned to Deckers Outdoor Corporation, a product company, or in other words, a practicing entity. Deckers Outdoor Corp. is a large company[211] in the apparel, footwear, and accessories business.[212] Deckers Outdoor Corp. oversees several brands, such as UGG (sheepskin boots), Teva (sandals), Sanuk (sandals), and Hoka (sneakers).[213] Between 2000 and 2016, D599,999 was asserted fifty-three times against 124 alleged infringers.[214] The next most asserted design

211. Deckers Outdoor Corp. reported net sales of approximately $1.9 billion in 2018. *Deckers Brands Reports Fourth Quarter and Fiscal 2018 Financial Results*, BUS. WIRE (May 24, 2018), https://www.businesswire.com/news/home/20180524006248/en/Deckers-Brands-Reports-Fourth-Quarter-Fiscal-2018.

212. *Id.*

213. The Deckers website identifies two Fashion Lifestyle Brands and three Performance Lifestyle Brands. *Brands*, DECKERS BRANDS, https://www.deckers.com/brands (last visited Oct. 4, 2020).

214. Unidentified alleged infringers were removed from the sum of alleged infringers. To do this, any alleged infringer containing a variation of "Does" was removed. Ninety-three cases out of the 225 cases representing the top ten most asserted design patents had at least one unidentified alleged infringer. Twenty-five cases had more than one unidentified alleged infringer listed in the Stanford NPE Litigation Dataset. For example, in *Deckers Outdoor Corp. v. P & Juss, Inc.*, No. CV 14-205-MWF(AJWx), 2014 U.S. Dist. LEXIS 79845

patent, D616,189, is also assigned to Deckers Outdoor Corp. and was asserted forty-two times against 102 alleged infringers. D616,189 is also a design patent for a portion of a footwear upper, and its figures depict a similar boot shaft. Often both Deckers Outdoor Corp. patents were asserted in the same civil action, but not always, and not in a majority of the cases. The third most asserted design patent, D621,068, a design patent for an architectural panel assigned to 3Form, Inc., was asserted against only thirty-two alleged infringers compared to 124 and 102 alleged infringers in the Deckers Outdoor Corp. cases. Deckers Outdoor Corp. sues a wide range of alleged infringers. Take *Deckers Outdoor Corp. v. Sears Holdings Corp.*[215] Among the list of alleged infringers were large companies, such as J.C. Penney Corporation, Inc. and Wal-Mart Stores, Inc., but also individuals, such as Frank Chen.[216] This pattern rings true throughout Deckers Outdoor Corp.'s cases with the top asserted design patents. The majority of the time, both Deckers Outdoor Corp. patents were asserted in the Central District of California, but they have also been asserted in the Eastern District of New York, the Southern District of New York, and the Northern District of Illinois.[217]

Lower in the list of most asserted design patents are three patents assigned to Oakley, Inc., another product company. Oakley, Inc. is a large company[218] in the eyewear and athletic equipment business.[219] Oakley, Inc.'s top asserted design patents are sometimes brought in the same civil action but not always. Oakley, Inc. frequently asserted D556,818 and D581,443, both design patents for eyeglass components, and D554,689 for an eyeglass frame. Between 2000 and 2016, D556,818 was asserted in fifteen cases against nineteen alleged infringers, D581,443 was asserted in fifteen cases against seventeen alleged infringers, and D554,689 was asserted in sixteen cases against seventeen alleged infringers. Sometimes they are accompanied by other patents assigned to Oakley, Inc. that did not make the list of the top ten most asserted design patents. Oakley's top asserted design patents are typically asserted in the Central District of California and the Southern District of California and, in rare instances, in the Southern District of New York.

Design patents like those owned by Deckers and Oakley may be used to pursue counterfeiters. Even if the rights afforded by design-patent protection

(C.D. Cal. June 10, 2014), "Does 1-10" is listed twice in the cell for alleged infringer. One hundred eighteen unidentified alleged infringers were removed out of 519 alleged infringers.

215. No. 2:14-cv-02561-ODW(CWx), 2014 U.S. Dist. LEXIS 177272 (C.D. Cal. Dec. 15, 2014).

216. *Id.*

217. *See, e.g.*, *id.*; Deckers Outdoor Corp. v. Huang, No. 1:15-CV-04772, 2017 U.S. Dist. LEXIS 61255 (E.D.N.Y. Apr. 20, 2017); Deckers Outdoor Corp. v. P'ships & Unincorporated Ass'n, No. 13 C 2167, 2013 U.S. Dist. LEXIS 47248 (N.D. Ill. Mar. 27, 2013).

218. LexisNexis Corporate Affiliations reports sales of $750–$799 million. *Oakley, Inc.*, LEXISNEXIS CORP. AFFILIATIONS (Sept. 28, 2020), https://plus.lexis.com/api/permalink/8233413c-bab3-4d8d-a018-35e245c36ea9/?context=1530671.

219. *Id.*

are narrow, they may be sufficient to successfully litigate against counterfeiters who intend to deceive consumers.[220] Often counterfeiters cease activities when sued. We acknowledge that our current data cannot distinguish between counterfeiters and allegations of good-faith design-patent infringement. We leave that important work for another study.[221]

In the utility-patent-litigation world, the most litigated patents are disproportionately owned by NPEs.[222] Here, the top ten most asserted design patents are all assigned to practicing product companies. This suggests that the characteristics of utility-patent litigation do not necessarily apply to design-patent litigation. Design-patent assignees with the most asserted patents are product companies rather than NPEs. They sue large and small alleged infringers and perhaps are primarily concerned with preventing copying.

CONCLUSION

Much literature surrounding patent litigation focuses on utility patents, whether it be about general litigation trends or NPEs. What is true for utility-patent litigation is not necessarily true for design-patent litigation. Thus, there is a gap in the literature that requires real-world litigation data on design patents. The present study provides necessary data to answer lingering questions about design-patent litigation. This Article classified patent asserters into numerous categories, including by revenue and entity type, and asserted patents into classification categories. It shows that what we know about utility-patent litigation cannot be applied to design-patent litigation.

Design-patent cases are clustered in different districts than utility-patent cases: namely, the Central District of California and the Northern District of Illinois rather than the Eastern District of Texas and the District of Delaware. More design-patent litigation occurs between small and medium entities than any other pair category. They are also brought, in the majority of cases, by practicing entities and are hardly ever brought by an entity that acquired the patent. Unlike in utility-patent litigation, the top asserted design patents are assigned to practicing entities, not NPEs, and they sue a variety of alleged infringers, ranging from individuals to large companies.

The findings have implications for patent doctrine. The courts have typically taken utility-patent law and applied it directly to design patents. For

220. Elizabeth Ferrill & Tina Tanhehco, *Protecting the Material World: The Role of Design Patents in the Fashion Industry*, 12 N.C. J.L. & TECH. 251, 254 (2011) ("A counterfeit represents a nearly exact duplicate of an item sold with the intent to be passed off as the original. Conversely, a knockoff is a close copy of the original design, mimicking its elements, but is not sold in an attempt to pass as the original." (footnote omitted)).

221. We suggest using the combination of foreign defendants and complaints with no answers as a rough proxy for counterfeiters.

222. *Trolls on Top*, *supra* note 123, at 26.

instance, in 1996 the Supreme Court ruled that judges, not juries, must construe utility-patent claims.[223] Thereafter, the Federal Circuit applied the decision to design-patent claims.[224] However, claim construction issues differ between utility-patent claims and design-patent claims. For instance, the issue of functionality only affects design patents.[225] Functionality intersects with claim construction of design patents and has caused some difficulties for courts.[226] Given how different design-patent litigation and utility-patent litigation play out in practice, it is worth revisiting the current practice of blindly applying utility-patent-law doctrine to design patents.

223. Markman v. Westview Instruments, Inc., 517 U.S. 370, 372 (1996).

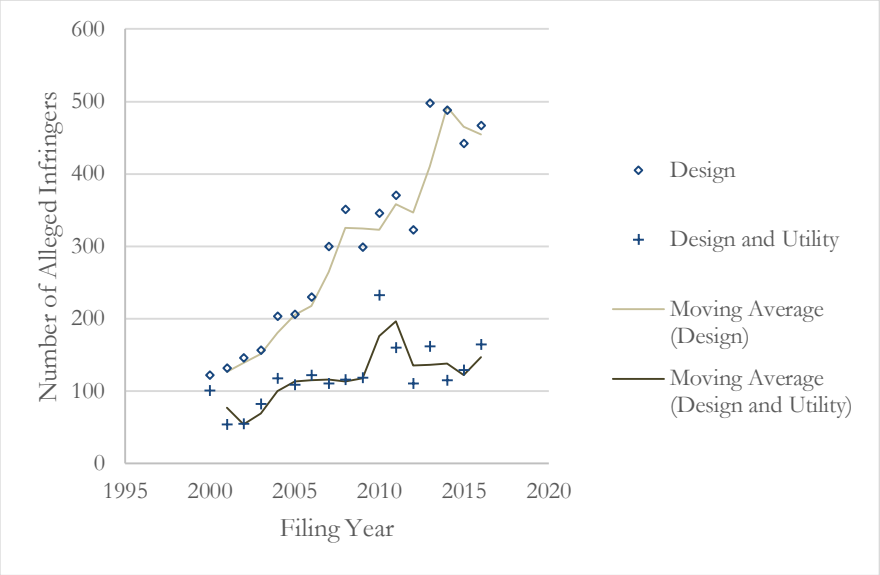
224. Goodyear Tire & Rubber Co. v. Hercules Tire & Rubber Co., 162 F.3d 1113, 1116 (Fed. Cir. 1998)).

225. *Cf.* 35 U.S.C. § 171 (2018) (requiring design patents to be "ornamental," precluding purely functional designs).

226. Case law is inconsistent on whether to separate functional from non-functional aspects of the design. *Compare* OddzOn Prods. v. Just Toys, Inc., 122 F.3d 1396, 1405 (Fed. Cir. 1997) ("Where a design contains both functional and non-functional elements, the scope of the claim must be construed in order to identify the non-functional aspects of the design as shown in the patent.") *with* Ethicon Endo-Surgery, Inc. v. Covidien, Inc., 796 F.3d 1312, 1329 (Fed. Cir. 2015) ("[T]he overall appearance of the article . . . is the basis of the relevant inquiry, not the functionality of elements of the claimed design viewed in isolation.").

APPENDIX A

Figure 6:
Number of Alleged Infringers by Year (2000–2016) (Design Only)



APPENDIX B

Table 5:
Design-Patent Litigation by District

Venue	**Number of Cases Filed**
C.D. Cal.	641
N.D. Ill.	215
S.D.N.Y.	171
S.D. Cal.	159
D.N.J.	135
N.D. Cal.	125
S.D. Fla.	121
E.D.N.Y.	94
N.D. Ohio	87
M.D. Fla.	83
D. Mass.	81
D. Colo.	78
W.D. Wash.	76
E.D. Tex.	75
D. Minn.	74
E.D. Mich.	67
N.D. Ga.	64
D. Conn.	55
N.D. Tex.	53
D. Nev.	47
E.D. Pa.	47
S.D. Tex.	46
D. Utah	44
E.D. Mo.	39
D. Del.	37
W.D. Tex.	33
W.D. Mich.	32
E.D. Wis.	31
W.D.N.C.	29
D. Ariz.	28
S.D. Ohio	28
M.D.N.C.	27
D. Or.	26
D.S.C.	22
E.D. Va.	22
E.D. Ark.	20
W.D. Mo.	20
E.D. Cal.	19
S.D. Ind.	18
W.D. Wis.	18
D. Kan.	17
W.D. Pa.	17
N.D.N.Y.	15
S.D. Iowa	13
C.D. Ill.	12
D. Md.	12
N.D. Ala.	12
W.D.N.Y.	12
E.D.N.C.	11
N.D. Okla.	11
W.D. La.	11
D.R.I.	10
N.D. Ind.	10
S.D. Ga.	10
M.D. Tenn.	9
W.D. Va.	8
D. Idaho	6
W.D. Tenn.	6

D.N.H.	5
E.D. Tenn.	5
M.D. Ga.	5
W.D. Ark.	5
W.D. Ky.	5
D.D.C.	4
D. Neb.	4
E.D. La.	4
E.D. Wash.	4
M.D. Ala.	4
M.D. Pa.	4
N.D. Iowa	4
W.D. Okla.	4
D. Haw.	3
D. Me.	2
D. Vt.	2
E.D. Ky.	2
M.D. La.	2

N.D. Fla.	2
S.D. W. Va.	2
D. Alaska	1
D. Guam	1
D.P.R.	1
D.S.D.	1
D.V.I.	1
S.D. Ala.	1
S.D. Ill.	1
D. Mont.	0
D.N.D.	0
D.N.M.	0
D. Wyo.	0
E.D. Okla.	0
N.D. Miss.	0
N.D. W. Va.	0
S.D. Miss.	0

Table 6:
USPTO Classifications for Asserted Design Patents

USPTO Classification	**Abbreviated Classification Definition**	**Weighted Count of Patents Asserted**
D06	Furnishings	290
D02	Apparel	271
D07	Severware	252
D26	Lighting	238
D12	Transportation	237
D08	Tools	228
D16	Photography	161
D14	Recording equipment	158
D03	Travel	141
D21	Toys	141
D23	Heating and cooling	135
D09	Containers	133
D24	Medical equipment	103
D13	Energy	98
D25	Construction	98
D11	Jewelry	97
D10	Testing instruments	93
D30	Animal husbandry	63
D15	Machines	61
D19	Office supplies	59
D22	Arms	56
D28	Cosmetics	50
D27	Smoking	39
D32	Washing, cleaning, or drying machine	39
D04	Brushware	35
D34	Material or article handling equipment	35
D29	Safety	33
D20	Sales	19
D18	Printing	16

D05	Textiles	9
D99	Miscellaneous	6
D01	Edible products	5
D17	Musical instruments	2

APPENDIX C

Figure 7 shows a representation of entity size in design-patent cases between 2000 and 2016. Instead of counting only one classification per design-patent case, as was done in Figure 4, in cases where there were multiple accused infringers, each plaintiff and accused infringer pair was counted. The results do not substantially vary in this method of counting.

Figure 7:
Entity Size in Design-Patent Cases (2000–2016) (Double Count)