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### Will Patenting Make As Much Sense in the New Regime of Weakened Patent Rights and Shorter Product Life Cycles?

David Hricik

Mercer University School of Law, hricik\_d@law.mercer.edu

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# Will Patenting Make As Much Sense in the New Regime of Weakened Patent Rights and Shorter Product Life Cycles?

David Hricik\*

## ABSTRACT

*After its founding in 1982, the US Court of Appeals for the Federal Circuit strengthened patent protection. During that time, businesses—which acquire 90 percent of all patents—increasingly applied for and enforced patents. Clearly, the benefit of having a patent outweighed the cost of doing so.*

*This Article shows that a central benefit of applying for a patent is that it permits its owner to exclude others from making the patented invention. A patent owner can use the coercive power of a patent to exclude others from making the invention, or to permit others to make the patented invention, but only if they pay money to do so. Two forces have reduced the power of that benefit.*

*First, patent rights have been weakened through changes in the law. The US Supreme Court has, almost without exception, reversed decisions of the Federal Circuit and adopted an approach that is less favorable to patent owners. Compared to today, in the year 2000, more inventions were eligible for patenting, more inventions were not obvious, more claims were definite, “equivalents” more likely infringed, infringement included more overseas conduct, patent rights were less easily exhausted, patentees could subject defendants to suits in districts more favorable to them, a losing patentee would almost never pay attorneys’ fees, and an injunction was the general rule that benefited a successful patent infringement plaintiff. More recently, Congress created administrative proceedings in the US Patent and Trademark Office that made it easier to challenge existing patents. In litigation, because of the statutory presumption of validity, patent claims are*

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\* Professor of Law, Mercer University School of Law; Of Counsel, Taylor English Duma, LLP.

*construed narrowly and, when possible, to avoid invalidity, and invalidity must be shown by clear and convincing evidence. In these new proceedings, the presumption does not apply, patent claims are construed more broadly, and only preponderant evidence is required to challenge a claim. Further, if a patent owner sues in court, courts will often stay the litigation in favor of allowing the Patent Office proceeding to finish. This effectively eliminates the presumption of validity. Other changes including heightened pleading requirements and state statutes also reduce the coercive benefit that patents confer.*

*After examining the available data as to whether these legal changes have already significantly altered the incentive to patent, the Article turns to the second force that reduces the benefit of the coercive power of patents: the fact that a greater number of products have shorter life cycles. Because patents take twenty-four months to issue, and the coercive power of a patent can only be utilized once it issues, the pace of change means that fewer patents will exist in time for their coercive power to be meaningfully applied. Further, that rapid pace of innovation has already created 3D printing, a technology that permits rapid and dispersed copying of new products, which further reduces the coercive benefit of patent rights.*

*This Article concludes by providing practical advice to patent practitioners as to how to manage the impact of these two forces. These include using established procedures to speed up prosecution, using claim drafting techniques that may help address 3D printing, and considering alternatives such as trade secret protection in lieu of patenting.*

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## I. INTRODUCTION

For the last few decades, patenting and patent litigation were booming. The number of patents issued by the US Patent and Trademark Office (USPTO) has increased almost every year since patents were first issued in 1790, and the number of patents issued has increased at an even greater rate in more recent decades—particularly since Congress created the US Court of Appeals for the Federal Circuit in 1982.<sup>1</sup> Moreover, while the number of patent infringement suits has generally increased over time, the pace increased more rapidly after 1982.<sup>2</sup> More recently, the size and

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1. See *U.S. Patent Activity: Calendar Years 1790 to the Present*, USPTO, [https://www.uspto.gov/web/offices/ac/ido/oeip/taf/h\\_counts.htm](https://www.uspto.gov/web/offices/ac/ido/oeip/taf/h_counts.htm) [https://perma.cc/V2BZ-ESCX] (last visited Aug. 8, 2017). The growth rate clearly increased after Congress created the Federal Circuit in 1982. See ELI DOURADO, MERCATUS CTR., GEO. MASON UNIV., TOTAL US PATENTS ISSUED ANNUALLY, 1900–2014 (2015), [https://www.mercatus.org/sites/default/files/Dourado-patent-chart\\_0.png](https://www.mercatus.org/sites/default/files/Dourado-patent-chart_0.png) [https://perma.cc/5W6S-M65W]; William M. Landes & Richard A. Posner, *An Empirical Analysis of the Patent Court*, 71 U. CHI. L. REV. 111, 128 (2004) (ascribing post-1982 increase in the rate of growth to Congress' creation of the Federal Circuit).

2. Matthew Sag, *IP Litigation in U.S. District Courts: 1994–2014*, 101 IOWA L. REV. 1065, 1078–79 (2016) (explaining that the annual volume of “patent litigation in the U.S. approximately doubled in the 16 years from 1994 until 2010,” and doubled again from 2010 to 2013).

number of businesses formed to acquire patents solely to enforce them—called “non-practicing entities,” “patent assertion entities,” or “patent trolls”—increased dramatically, and for the first time it became common for patents to be sold in large numbers on secondary markets.<sup>3</sup>

Businesses, not individuals, receive the vast majority of those patents—over 90 percent in 2015.<sup>4</sup> Presumably, as rational economic actors, businesses that sought or later acquired patents on secondary markets concluded that the benefits of doing so increasingly exceeded the costs. If businesses are acting rationally in exercising the option to apply for a patent or to acquire existing patents,<sup>5</sup> then for more than thirty years the cost-benefit analysis has strongly favored patenting. Because intellectual property is important to the US economy,<sup>6</sup> whether businesses will continue to patent is a significant issue.

Of course, a business considering whether to patent weighs the costs against the benefits of doing so. Out-of-pocket costs that accompany applying for a patent include the attorneys’ fees and related expenses (such as costs to draft drawings) to prepare and then prosecute a patent application, the fees charged by the USPTO to file and prosecute an application,<sup>7</sup> as well as fees charged by the USPTO

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3. See Tom Ewing, *Indirect Exploitation of Intellectual Property Rights by Corporations and Investors*, 4 HASTINGS SCI. & TECH. L.J. 1, 22–24 (2012). Some form of secondary market for patents has existed in the United States almost since its inception. See, e.g., Adam Mossoff, *Patent Licensing and Secondary Markets in the Nineteenth Century*, 22 GEO. MASON L. REV. 959, 960–61 (2015). However, business entities that the Federal Trade Commission has labeled “Portfolio Patent Assertion Entities”—which acquire thousands of patents—came into existence in significant numbers only in the last few years. See FED. TRADE COMM’N, PATENT ASSERTION ENTITY ACTIVITY: AN FTC STUDY 45–47 (2016) [hereinafter FTC STUDY], [https://www.ftc.gov/system/files/documents/reports/patent-assertion-entity-activity-ftc-study/p131203\\_patent\\_assertion\\_entity\\_activity\\_an\\_ftc\\_study\\_0.pdf](https://www.ftc.gov/system/files/documents/reports/patent-assertion-entity-activity-ftc-study/p131203_patent_assertion_entity_activity_an_ftc_study_0.pdf) [https://perma.cc/SBH6-K3XF] (discussing the means by which Portfolio Patent Assertion Entities acquire patents in massive numbers through secondary acquisitions); Ewing, *supra*, at 27–28 (discussing the rise of secondary markets and patent assertion entities); Sag, *supra* note 2, at 1078–79 (discussing the rise in patent litigation attributable to non-practicing entities); *infra* Part II.A.5 (discussing non-practicing entities). For a discussion of the extent to which startup companies sell patents to patent assertion entities, see Robin Feldman, *Patent Demands & Startup Companies: The View from the Venture Capital Community*, 16 YALE J.L. & TECH. 236 (2014).

4. PATENT TECH. MONITORING TEAM, U.S. PATENT & TRADEMARK OFFICE, ALL TECHNOLOGIES (UTILITY PATENTS) REPORT tbl.A1-2b [https://www.uspto.gov/web/offices/ac/ido/oeip/taf/all\\_tech.htm](https://www.uspto.gov/web/offices/ac/ido/oeip/taf/all_tech.htm) [https://perma.cc/B6H6-6D5X] (last visited Aug. 8, 2017) (reporting that 93.2 percent of US patents issued in 2015 were assigned to business entities).

5. See Christopher A. Cotropia, *Describing Patents as Real Options*, 34 J. CORP. L. 1127, 1148–49 (2009) (discussing the alignment of economic incentives with patent objectives).

6. See, e.g., FTC STUDY, *supra* note 3, at 9.

7. The amount of USPTO fees depends on numerous facts, including the number of claims, the economic size of the applicant, and even how the application is filed. See *USPTO Fee*

every few years to maintain (i.e., to keep in force) an issued patent.<sup>8</sup> A business considering the costs of applying for a patent would also consider the fact that the process will take employee time, distract some workers from their jobs, and similar indirect costs.<sup>9</sup> In addition, a business applying for a patent must consider lost competitive advantage caused by the requirement that a patent must disclose the information necessary to make the claimed invention, as well as the “best mode” for doing so.<sup>10</sup> If that information is not known to competitors, any advantage gained by that fact is lost by filing a patent application. Finally, to the extent that the business wants a patent in order to prevent others from making the patented invention, a reasonable business would consider the fact that it costs money to enforce a patent. A patentee must file a suit or engage in other enforcement efforts, either of which generally requires attorney time, and thus attorneys’ fees. In addition, litigation requires employee time, and so causes lost productivity. There are, in other words, significant costs to filing for patent protection that any reasonable business would weigh in deciding whether to do so.

This Article focuses on the decreasing benefits of patent protection experienced over the past few years and how the benefit of patenting will continue to decrease rapidly in the near future. The primary reason this Article focuses on benefits, rather than costs, is that during the time when patenting boomed, there was no great reduction in the cost of obtaining a patent or enforcing one. The costs to obtain a patent likely will remain flat or modestly decrease in the near future: While artificial intelligence could reduce the amount of attorneys’ fees necessary for patent prosecution,<sup>11</sup> USPTO fees will

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*Schedule*, USPTO (Sept. 1, 2017), <https://www.uspto.gov/learning-and-resources/fees-and-payment/uspto-fee-schedule#Patent%20Fees> [https://perma.cc/97SR-R8XQ].

8. Maintenance fees are due 3–3½, 7–7½, and 11–11½ years after a patent issues. See *Maintain Your Patent*, USPTO (July 27, 2017, 12:02 PM), <https://www.uspto.gov/patents-maintaining-patent/maintain-your-patent> [https://perma.cc/WA2Y-6FHU]. The amount increases over time but varies depending on whether the owner is a small or large business; however, for many businesses, fees start at \$1,600 and end at \$7,400. See *USPTO Fee Schedule*, *supra* note 7.

9. Incidental, but potentially significant, economic “costs” of the patent application process include monitoring for ideas that may be patentable and having the inventor participate in patent prosecution by, among other things, reading drafts of the patent application to confirm that it describes the invention. The business must also monitor prosecution and consider whether a patentable idea would be useful to the business. Although these costs are real, quantifying them is beyond the scope of this Article; they no doubt vary wildly depending on the business, the nature of the technology, and the business’s and inventor’s knowledge of or experience with patent prosecution.

10. See 35 U.S.C. § 112(a) (2011).

11. See David Hricik, *Machine Aided Patent Drafting: A Second Look*, PATENTLYO (Aug. 25, 2017), <https://patentlyo.com/hricik/2017/08/machine-patent-drafting.html> [https://perma.cc/5JJM-GHQ8].

likely continue to increase, and patentees will still be required to disclose how to make their invention. Just as the costs to obtain a patent remained relatively flat during the time of the patent boom, the costs to enforce one likewise remained relatively constant.<sup>12</sup> Just as the costs to obtain a patent do not appear likely to precipitously drop, the costs to enforce a patent through litigation do not seem likely to precipitously drop any time soon.<sup>13</sup> Further, as shown below,<sup>14</sup> because of changes in fee-shifting, the net cost of enforcement has likely gone up.

There are many benefits to patenting.<sup>15</sup> This Article focuses on the coercive benefit of owning a patent—namely, the potential for the rights holder to exclude others from selling a patented invention, or, if not exclude them, to obtain money damages from litigation or to generate revenue through licensing, either in lieu of litigation or as a result of it. The right to prevent copying or to obtain damages from those who do is the “primary driver” of obtaining patents given by

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12. LAW PRACTICE MGMT. COMM., AM. INTELLECTUAL PROP. LAW ASS'N, 2017 REPORT OF THE ECONOMIC SURVEY 30–31, 41–42 (2017).

13. Interestingly, and for reasons discussed more fully below, the cost of patent litigation *per case* decreased suddenly and somewhat sharply between 2015 and 2017. *See* Malathi Nayak, *Cost of Patent Infringement Litigation Falling Sharply*, BLOOMBERG BNA (Aug. 11, 2017), <https://bol.bna.com/cost-of-patent-infringement-litigation-falling-sharply> [https://perma.cc/Y6BR-PSM2]. The reason for the decline, however, is not that attorneys' hourly rates suddenly declined; rather, it became easier for defendants to stay patent suits and force the patentee to defend its patent in an administrative proceeding in the USPTO, in which patents are more easily found invalid, a finding that ends the patent suit. *See id.* (“[L]itigants controlled expenses and increasingly skipped courtrooms to challenge a patent's validity at the [USPTO].”) Thus, it is now remarkably cheaper to *defend* a patent suit by avoiding litigation and instead invalidating a patent in an administrative proceeding at the USPTO, but there is no indication that the costs to a patentee to actually enforce the patent have gone down. *See infra* Part II.

14. *See infra* Part II.

15. *See generally* Clarissa Long, *Patent Signals*, 69 U. CHI. L. REV. 625 (2002) (recognizing exclusivity, disclosure, defense against competitors, and other benefits of patenting). As noted above, the vast majority of patents are issued to businesses. Most patents, even if owned by businesses, are not enforced in litigation. *See* Mark A. Lemley, *The Surprising Resilience of the Patent System*, 95 TEX. L. REV. 1, 44 (2016). Some patents, no doubt, serve functions in addition to providing their owner with the right to exclude others from infringing the patent. In fact, patents perform many functions, including signaling to investors that their owner innovates, serving as defensive measures (a business that owns patents which is sued by a competitor for infringement might have a counterclaim, for example), signaling information as to the credentials of the inventor, and other functions. *See id.* at 40–43; Jason Rantanen & Sarah E. Jack, *Patents as Credentials* 4–5 (Univ. Iowa Legal Studies, Research Paper No. 2017-27, 2017), [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3013780](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3013780) [https://perma.cc/G22D-9GSP]; *see also* Ron Katznelson, *A Century of Patent Litigation in Perspective* (Nov. 17, 2014) (unpublished manuscript), <https://ssrn.com/abstract=2503140> [https://perma.cc/Q27E-MD3Q]. *But see* Long, *supra*, at 630 (finding it illogical to have a patent without enforcing that patent).

entrepreneurs,<sup>16</sup> and courts, legislatures, and academics have focused on the ability of patentees to rely on the expense of defending patent infringement suits to justify reducing the coercive power of patents.<sup>17</sup> For digital businesses, where copying can occur rapidly and at little cost, “intellectual property protections have become an increasingly crucial incentive to firms.”<sup>18</sup> This Article shows that the coercive power of patents has declined and will continue to decline. Specifically, this Article shows that two forces have recently reduced the coercive power of patents and will likely continue to do so in the near future.

The first force is legal: the Supreme Court, Congress, and other authorities have made patents more difficult to obtain, easier to challenge, and riskier to enforce.<sup>19</sup> Businesses have less incentive to patent because it is less likely today than at the beginning of this century for a business to obtain a patent and either prevail in litigation or successfully license the patent to obtain revenue. Part II of this Article catalogs the numerous recent, powerful, and varied changes that these authorities have made to the law that have reduced the coercive power of patents and so reduced the incentive to seek patent protection. Part III then analyzes the available evidence as to the degree to which those changes in the law in fact have reduced the incentive to patent.

The second force reducing the coercive power of patents is, ironically enough, innovation: Because of the rapid pace of innovation, products are brought to market—and replaced—more quickly than ever before.<sup>20</sup> Not only is that true, but the pace of change is rapidly increasing. If a business wants a patent to use its coercive power to stop competitors from making a patented product, it has no reason to obtain a patent if its competitors will not be selling the product after the patent issues. For example, if a business expects its new product’s life cycle to be one year, there is less reason to obtain a patent because by the time the patent issues the market for that product will be gone.

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16. See Ted Sichelman & Stuart J.H. Graham, *Patenting by Entrepreneurs: An Empirical Study*, 17 MICH. TELECOMM. & TECH. L. REV. 111, 154 & fig.1 (2010) (opining on the conflict between preventing copying and promoting competition, versus sensitivity to startup costs).

17. See *infra* Part II.B.

18. See John M. Newman, *Anticompetitive Product Design in the New Economy*, 39 FLA. ST. U. L. REV. 681, 687 (2012).

19. See *infra* Part II.A.

20. See *infra* Part IV.

Patents take about twenty-four months to obtain.<sup>21</sup> If a product comes and goes before twenty-four months, there will be no infringement. Likewise, the closer a product's life cycle gets to twenty-four months, the less value the patent has.<sup>22</sup> Accordingly, Part IV of this Article describes the exponential increase in the pace of technological change that has resulted—and will continue to result—in more products entering and exiting the market more efficiently than ever before. On a related but distinct point, Part IV describes how 3D printing reduces potential damages by allowing for dispersed and hard-to-detect infringement.

This Article then puts into practical terms what these reductions in coercive power mean for practitioners and businesses. It describes alternatives to patenting and to traditional patent prosecution that businesses and their attorneys may want to consider, and perhaps to weigh more heavily, either before or after applying for patent protection. This Article concludes by briefly discussing the broader policy implications presented by the changes which have, and will continue, to erode the coercive power of patents.

## II. THE FIRST FORCE: FEDERAL AND STATE AUTHORITIES HAVE IN NUMEROUS WAYS CHANGED THE LAW TO REDUCE THE COERCIVE POWER OF PATENTS

This Article focuses on the coercive power of patents. A patent is often characterized as giving its owner the temporary right to exclude others from making, using, or selling the patented invention.<sup>23</sup> At a high level, this is correct: a patent owner can sue those who infringe and seek monetary compensation, injunctive relief, or both.<sup>24</sup> That right is temporary in that it lasts twenty years from the date of filing of the patent application, and so for a typical patent, issued after an average twenty-four-month examination in the USPTO, this right to coercive relief would subsist for almost eighteen years.<sup>25</sup> Thus, at a general level, a patent gives its owner a temporary coercive power.

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21. See *Data Visualization Center: First Office Action Pendency*, USPTO, <https://www.uspto.gov/corda/dashboards/patents/main.dashxml?CTNAVID=1004> [<https://perma.cc/PH6Q-395A>] (last visited Sept. 17, 2017).

22. See *infra* Part IV.C.

23. *E.g.*, *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 392 (2006). As explained below, because it is no longer the general rule to award injunctive relief after patent infringement is found, the reality is a bit more nuanced than this general characterization of a patent as conveying the right to exclude others. See *infra* note 236 and accompanying text.

24. See 35 U.S.C. §§ 283–84 (2012); see also *eBay Inc.*, 547 U.S. at 394.

25. *Cf. supra* note 21 and accompanying text (explaining the time period for patent obtainment).

To the extent that changes in the law make obtaining a patent more difficult, make enforcing a patent harder, or create greater risk or lower the reward of enforcing a patent, a patent has less coercive power. To put it simply, the cheaper and easier it is to get a patent and enforce it, the more reason a business has to apply for a patent. Conversely, the more difficult it is to obtain a patent, or the less likely it is that any suit will result in coercive relief, the less reason there is to seek a patent or acquire one in the secondary market.

During the late twentieth century, the Federal Circuit led a definite march toward stronger patent rights. After its founding in 1982, the Federal Circuit<sup>26</sup> stabilized the patent system and created a more patent-friendly body of law in the United States than had existed.<sup>27</sup> That trend had been relatively consistent and persistent.<sup>28</sup> It became easier to obtain and enforce a patent, and as a result, the coercive power of patents grew.<sup>29</sup> Accordingly, to the extent that businesses sought patents because of the benefit of their coercive power, the incentive to patent increased.

This century, the Supreme Court ordered an about-face. The following Section shows that virtually every one of the nearly sixty Supreme Court decisions this century reversed the Federal Circuit's approach in favor of weaker patent rights. In addition, Congress and other authorities have made patents more vulnerable, more difficult to enforce, or both. This Part describes those changes in the law and examines the data on the extent to which those changes made it harder to obtain a patent, riskier to enforce a patent, and reduced or curtailed injunctive relief. The following Section shows that, to the extent that businesses seek patents to obtain coercive relief, they have much less incentive to do so today than when this century began.

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26. Elizabeth I. Winston, *Differentiating the Federal Circuit*, 76 MO. L. REV. 813, 813 (2011).

27. See Damon C. Andrews, *Promoting the Progress: Three Decades of Patent Jurisprudence in the Court of Appeals for the Federal Circuit*, 76 MO. L. REV. 839, 839–40 (2011); Lemley, *supra* note 15, at 7–8.

28. See Andrews, *supra* note 27, at 850; see also Landes & Posner, *supra* note 1, at 128 (“The creation in 1982 of a court having a monopoly of patent appeals has had a significant effect on patent activity as a consequence of the pro-patent leanings of the new court.”).

29. Although patents grew more valuable under the Federal Circuit's watch, the court pruned patent protection somewhat. For example, the Federal Circuit has worked against awards of reasonable royalty damages that seemed unmoored to the realities of licensing or the benefits of a particular patented invention. See David Franklyn & Adam Kuhn, *The Problem of Mop Heads in the Era of Apps: Toward More Rigorous Standards of Value Apportionment in Contemporary Patent Law*, 98 J. PAT. & TRADEMARK OFF. SOC'Y 182, 194–95 (2016); Daryl Lim, *I Dissent: The Federal Circuit's "Great Dissenter," Her Influence on the Patent Dialogue, and Why It Matters*, 19 VAND. J. ENT. & TECH. L. 873, 980 (2017); see also, e.g., *Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292, 1295 (Fed. Cir. 2009).

*A. The Supreme Court Has Routinely Reversed Federal Circuit Decisions and in Doing So Made Patents More Difficult to Obtain, Easier to Invalidate, Harder to Infringe, and Also Limited Likely Remedies*

A study concluded that the Supreme Court reversed the Federal Circuit's patent law decisions 70 percent of the time.<sup>30</sup> This Section summarizes key Supreme Court decisions from this century, organized according to which aspect of patent rights the cases affected. It shows that the Court has almost uniformly reduced the coercive power of patents by making patents easier to invalidate (and, as a consequence, harder to obtain from the USPTO), riskier to enforce, and—perhaps most fundamentally—has made it clear a patent in fact does not give its owner the general right to exclude others from infringing.<sup>31</sup> A business considering whether to apply for a patent knows that patents are harder to get, easier to lose, riskier to use, and less likely to result in being able to prevent competitors from infringing.

To be clear from the outset, the fact that the Court weakened patent rights does not mean that any or all of its decisions were legally incorrect, that the Federal Circuit's general trend toward a stronger patent system is mandated by the Patent Act or the Constitution, or that a stronger patent system is somehow “better” in terms of innovation or other social goals.<sup>32</sup> In that regard, studies from the Federal Trade Commission (FTC) in 2003 and later from the National Academy of Sciences in 2005 pointed to excesses in the system.<sup>33</sup> The point made in this Section is not whether any or all

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30. Paul R. Gugliuzza, *How Much Has the Supreme Court Changed Patent Law?*, 16 CHI.-KENT J. INTELL. PROP. 330, 330–31 (2017).

31. The Supreme Court has decided many patent cases this century. Some patent cases decided by the Court either had no obvious impact on patenting or likely impacted a narrow range of patents or industries. *See, e.g.*, Fed. Trade Comm'n v. Actavis, Inc., 133 S. Ct. 2223, 2227 (2013); Gunn v. Minton, 568 U.S. 251, 263–64 (2013); Bd. of Trs. of Leland Stanford Junior Univ. v. Roche Molecular Sys., Inc., 563 U.S. 776, 780 (2011). Some argue that the Court has decided some patent cases to prevent the Federal Circuit from treating patent law differently from analogous areas of law—from engaging in “patent exceptionalism.” Peter Lee, *The Supreme Assimilation of Patent Law*, 114 MICH. L. REV. 1413, 1422 (2016).

32. *See* Feldman, *supra* note 3, at 239; Mark A. Lemley, *IP in a World Without Scarcity*, 90 N.Y.U. L. REV. 460, 464 (2015); Maureen K. Ohlhausen, *Patent Rights in a Climate of Intellectual Property Skepticism*, 30 HARV. J.L. & TECH. 103, 152 (2016) (analyzing empirical data regarding the strength of patent protection and innovation).

33. *See* COMM. ON INTELLECTUAL PROP. RIGHTS IN THE KNOWLEDGE-BASED ECON., NAT'L RESEARCH COUNCIL OF THE NAT'L ACADEMIES, A PATENT SYSTEM FOR THE 21ST CENTURY 81–83 (Stephen A. Merrill et al. eds., 2004); FED. TRADE COMM'N, TO PROMOTE INNOVATION: THE PROPER BALANCE OF COMPETITION AND PATENT LAW AND POLICY 5 (2003).

decisions were legally correct or effectuated sound policy; the point is that patents are weaker as a result.

### 1. The Supreme Court Made Fewer Inventions Patentable and as a Result Made More Issued Patents Invalid

The concept of patentability and invalidity are related but distinct. The USPTO decides patentability. During the application process, the USPTO determines whether an invention claimed in a patent application is “patentable.”<sup>34</sup> Likewise, in post-grant proceedings, the USPTO determines whether a claim in a patent that it previously issued is patentable.<sup>35</sup> In litigation, courts decide whether a claim in an issued patent is “invalid.”<sup>36</sup> As a general matter, the same legal principles apply to patentability and invalidity, although as noted below, there are important differences.<sup>37</sup> Thus, in deciding whether an invention is patentable, the USPTO follows case law from the Supreme Court (and the Federal Circuit) that addresses invalidity.<sup>38</sup>

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34. 35 U.S.C. §§ 101–03, 112 (2012). Summarizing the entirety of patent law is outside the scope of this Article. Generally, however, patent law requires that for a claimed invention to be patentable: (1) the subject matter must be eligible for patenting under Section 101; (2) the claimed invention must be new in terms of Section 102; (3) the claimed invention must have been “non-obvious” in terms of Section 103; (4) the claim must be definite in terms of Section 112; and (5) the patent must disclose how to make and use the invention and include the best mode for doing so. *Id.* Each is a requirement to obtain a patent; the USPTO should not issue a patent that fails to meet any of those requirements. *See id.* Further, each requirement (apart from best mode), is a basis for invalidity of a patent. *Id.* § 282(b).

35. *See* U.S. Patent & Trademark Office, *Post Grant Review*, <https://www.uspto.gov/patents-application-process/appealing-patent-decisions/trials/post-grant-review> [<https://perma.cc/VA2A-WQ5B>] (last visited Nov. 3, 2017).

36. *See, e.g.*, *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144 (2016).

37. *See infra* notes 185–89 and accompanying text.

38. For this reason, the USPTO generally relies on Supreme Court and Federal Circuit precedent concerning invalidity issues when determining patentability. *See, e.g.*, *Autel U.S. Inc. v. Bosch Auto. Serv. Sols. LLC*, No. IPR2014-00183 (P.T.A.B. May 5, 2015) (citing Supreme Court and Federal Circuit precedent in an obviousness determination); MANUAL OF PATENT EXAMINING PROCEDURE § 2173.02 (2015) (citing *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2129 (2014)). However, there are differences between invalidity and unpatentability, and they are critical. As shown more fully below, the burden of proof required to show invalidity is higher—clear and convincing evidence, not preponderant evidence—and the claims are interpreted more broadly by the USPTO than in litigation. *See infra* notes 172–75 and accompanying text. Other differences between validity and patentability exist, including the fact that the USPTO, in determining whether a claim would have been obvious, uses a burden-shifting process that likely does not apply to determine invalidity for obviousness. Compare MANUAL OF PATENT EXAMINING PROCEDURE § 2141 (explaining a burden-shifting framework), with *Wm. Wrigley Jr. Co. v. Cadbury Adams USA LLC*, 683 F.3d 1356, 1370 (Fed. Cir. 2012) (citing *In re Cyclobenzaprine Hydrochloride Extended-Release Capsule Patent Litig.*,

Importantly, if the Supreme Court's interpretation of what is patentable narrows after a patent issues, the courts and the USPTO apply that law retroactively.<sup>39</sup> The fiction, of course, is that the law did not change but that, effectively, the USPTO had been wrong in its understanding. Thus, a patent that the USPTO properly issued—at least as it understood the law as it existed at that time—might nonetheless be “invalid” in later litigation. Likewise, a patent that the USPTO properly issued under the law as it understood it at the time could be found by the USPTO to be unpatentable in a post-grant proceeding.<sup>40</sup> A change in the law could mean that issued patents are no longer valid. This Section shows that the Court has made patents easier to invalidate, and consequently more difficult to be patentable, in several recent cases.

*a. The Supreme Court Made Fewer Inventions Eligible for Patenting*

Section 101 of the Patent Act is permissive, stating only that “[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.”<sup>41</sup> Consistent with its permissive language, Section 101 had been largely ignored in patent prosecution and litigation as a requirement for patenting and a basis for invalidity until 2010.<sup>42</sup>

In the last seven years, however, the Supreme Court issued a series of cases that “have significantly impacted patent eligibility

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676 F.3d 1063, 1079–80 (Fed. Cir. 2012)) (stating that a burden-shifting framework is not required).

39. See, e.g., Gene Quinn, *Retroactive Changes to Patent Eligibility Law Suggest Patents Are Not a Property Right*, IPWATCHDOG (Apr. 6, 2015), <http://www.ipwatchdog.com/2015/04/06/retroactive-patent-eligibility-patents-not-a-property-right/id=56205/>.

40. On a related note, the USPTO has for years had a backlog of applications; some of those no doubt were filed at a time when the applicant reasonably believed the invention was patentable. See Warren K. Mabey, Jr., *Deconstructing the Patent Application Backlog*, 92 J. PAT. & TRADEMARK OFF. SOC'Y 208, 239 (2010) (discussing backlog generally).

41. An Act To Revise and Codify the Laws Relating to Patents and the Patent Office, and to Enact into Law Title 35 of the United States Code Entitled “Patents,” 82 Pub. L. No. 593, § 101, 66 Stat. 793, 797 (1952) (codified as amended at 35 U.S.C. § 101 (2012)).

42. See Robert R. Sachs, *Patent Invalidation Rates: The Summertime Blues Continue*, LAW360 (Sept. 2, 2015, 11:37 AM), <https://www.law360.com/articles/697396/patent-invalidation-rates-the-summertime-blues-continue> [<https://perma.cc/V4ME-JTBV>] (showing that the “courts invalidated more patents in the 14 months since [the 2014 Supreme Court decision in *Alice Corp. v. CLS Bank International*, 134 S. Ct. 2347 (2014)] then [sic] in the five years previous to [*Alice*].”).

law.”<sup>43</sup> In those cases, the Court restricted what inventions are even eligible for patenting by holding that each of the following inventions, even if new and nonobvious, was not even eligible for patent protection: a method for hedging risk;<sup>44</sup> a method for optimizing drug dosages;<sup>45</sup> a claim to isolate genes;<sup>46</sup> and, most recently, a claim to a computer-implemented method to mitigate settlement risk.<sup>47</sup>

The consequence of these decisions is multifaceted. First and foremost, fewer inventions are patentable now, reducing the incentives to patent. Second, patents that were issued before these decisions are more easily invalidated.<sup>48</sup> Finally, the procedural safeguards that courts afford when determining invalidity based on other bases of invalidity in the Patent Act are not afforded in applying Section 101. Specifically, patents are being found “invalid” under Section 101 at the pleading stage and without clear and convincing evidence of invalidity. Although it is very rare for courts to find a patent invalid on the pleadings for any other basis of invalidity in the Patent Act, courts find ineligibility frequently at the pleading stage.<sup>49</sup> Because Section 101 can be raised early and relatively cheaply, it reduces patent protection.

It is difficult to understate the impact of the Supreme Court’s decisions involving Section 101.<sup>50</sup> Thousands of patents likely became invalid after these decisions, essentially rendering them worthless at

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43. U.S. PATENT & TRADEMARK OFFICE, PATENT ELIGIBLE SUBJECT MATTER: REPORT ON VIEWS AND RECOMMENDATIONS FROM THE PUBLIC 7 (2017), [https://www.uspto.gov/sites/default/files/documents/101-Report\\_FINAL.pdf](https://www.uspto.gov/sites/default/files/documents/101-Report_FINAL.pdf) [<https://perma.cc/ZCE3-HJZG>].

44. *Bilski v. Kappos*, 561 U.S. 593, 599, 613 (2010).

45. *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 72, 92 (2012).

46. *Ass’n for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S. Ct. 2107, 2111 (2013).

47. *Alice*, 134 S. Ct. at 2352.

48. See Jonathan Stroud, *Patent Post-Grant Review After Alice*, 69 BAYLOR L. REV. 56, 80 (2017); Robert R. Sachs et al., *#AliceStorm: April Update and the Impact of TC Heartland on Patent Eligibility*, FENWICK & WEST: BILSKI BLOG (June 1, 2017), <http://www.bilskiblog.com/blog/2017/06/alicesstorm-april-update-and-the-impact-of-tc-heartland.html> [<https://perma.cc/6N82-XZDC>].

49. See Saurabh Vishnubhakat, *The Antitrust of Patentability*, 48 SETON HALL L. REV. 71, 106 figs.1 & 2 (2017); Natalie Hanlon Leh and Nora Q.E. Passamaneck, *Here We Go Round the Merry-Go-Round: How a § 101 Denial May Inform a Subsequent Motion*, BNA’S PATENT, TRADEMARK & COPYRIGHT JOURNAL (2016), [https://www.wilmerhale.com/uploadedFiles/WilmerHale\\_Shared\\_Content/Editorial/Publications/Publication/2016-03-23-BloombergBNA-Here-We-Go-Round-the-Merry-Go-Round-How-a-101-Denial-May-Inform-a-Subsequent-Motion.pdf](https://www.wilmerhale.com/uploadedFiles/WilmerHale_Shared_Content/Editorial/Publications/Publication/2016-03-23-BloombergBNA-Here-We-Go-Round-the-Merry-Go-Round-How-a-101-Denial-May-Inform-a-Subsequent-Motion.pdf) [<https://perma.cc/354M-VQVK>].

50. A recent analysis concluded that, by issuing opinions only when district courts err in finding a patent ineligible, the Federal Circuit is—through its silence—moving the law even further in a direction that is against patentees. Paul R. Gugliuzza & Mark A. Lemley, *Can a Court Change the Law by Saying Nothing?*, 71 VAND. L. REV. (forthcoming 2017) (manuscript at 2–6), [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3015459](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3015459) [<https://perma.cc/6W5T-CJEB>].

best. The impact has been felt most particularly in the life sciences and computer technologies areas of innovation.<sup>51</sup> In that regard, a 2016 analysis determined that the Supreme Court had “crushed” certain secondary markets relating to computer technologies.<sup>52</sup> Plainly, because fewer inventions are eligible for patenting, there is less incentive to patent. Further, because issued patents may be “ineligible,” there is less incentive to acquire patents on the secondary market. There is less reason to file a patent application today than there was in 2010, before the Court decided these cases.

*b. The Supreme Court Made It Harder to Obtain a Patent and Easier to Invalidate One*

The requirement that an invention be new essentially means the invention claimed in a patent application must be different—in some way—from those inventions that had been previously disclosed to the public.<sup>53</sup> If there is a difference, the invention is new. But beyond a literal difference, the patent laws require that the difference between the claimed invention and what was known before also would not have been obvious to a person of ordinary skill in the art.<sup>54</sup> Determining whether an invention would have been obvious is a complex endeavor, since the question is whether it would have been obvious to make the invention without knowing of it.<sup>55</sup>

The Federal Circuit had long held that patent could be held invalid as obvious only if the prior art explicitly taught, suggested, or otherwise provided a motivation to combine prior art references to make the claimed invention.<sup>56</sup> Essentially, there had to be written evidence in a patent or article that suggested doing or trying what was different between the claimed invention and the prior art. In *KSR International Co. v. Teleflex Inc.*, the Federal Circuit applied that test to reverse a district court finding of obviousness.<sup>57</sup>

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51. U.S. PATENT & TRADEMARK OFFICE, *supra* note 43, at 47.

52. KENT RICHARDSON, ROL GROUP, APLI—IMPACT OF THE PATENT MARKET 2016, at 2 (2016), <https://www.law.berkeley.edu/wp-content/uploads/2016/09/Richardson-Investment-Portfolios-Buying-Selling-Litigation.pdf> [<https://perma.cc/8ZAG-SX8F>].

53. 35 U.S.C. § 102 (2012); *see also* Sean B. Seymore, *Rethinking Novelty in Patent Law*, 60 DUKE L.J. 919, 930 (2011).

54. 35 U.S.C. § 103.

55. *See* Glynn S. Lunney, Jr. & Christian T. Johnson, *Not So Obvious After All: Patent Law's Nonobviousness Requirement, KSR, and the Fear of Hindsight Bias*, 47 GA. L. REV. 41, 43–44 (2014).

56. *Id.* at 42–43, 64.

57. *Id.* at 66–67.

The Supreme Court reversed and rejected the test,<sup>58</sup> calling it “rigid and mandatory formulas,” and instead held that there need not have been “published articles and the explicit content of issued patents,” but instead obviousness could be found by using “common sense,” “market demand,” or “design trends.”<sup>59</sup> *KSR* made it more difficult to obtain a patent and easier to invalidate an existing one by eliminating the need for written proof that someone would have been motivated to do what the inventor did.<sup>60</sup>

Another requirement for patentability, and also a basis for invalidity, is that each claim of a patent must be definite. Specifically, Section 112 of the Patent Act requires that a patent point out and distinctly claim the invention.<sup>61</sup> Failure to meet this requirement is called “indefiniteness.”

The Federal Circuit had held that indefiniteness required clear and convincing evidence that the claim was “not amenable to construction” or was “insolubly ambiguous” as construed.<sup>62</sup> The Supreme Court rejected the Federal Circuit’s test as too narrow, thus making it harder to obtain patents and rendering issued patents more likely to have indefinite claims.<sup>63</sup> Specifically, the Supreme Court required a claim to provide “reasonable certainty” about its scope.<sup>64</sup> It is not yet clear the degree to which the case will make it easier to establish invalidity, but it makes invalidity for indefiniteness easier to prove and, likewise, patentability more difficult to establish.<sup>65</sup>

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58. *KSR Int'l. Co. v. Teleflex Inc.*, 550 U.S. 398, 415 (2007).

59. *Id.* at 419–20.

60. Ali Mojibi, *An Empirical Study of the Effect of KSR v. Teleflex on the Federal Circuit's Patent Validity Jurisprudence*, 20 ALB. L.J. SCI. & TECH. 559, 572–73, 596 (2010) (concluding that district courts were “over seven times more likely to find patents obvious as a result of *KSR*” and the Federal Circuit was also “more likely . . . to find a patent obvious on review”); Jennifer Nock & Sreekar Gadde, *Raising the Bar for Nonobviousness: An Empirical Study of Federal Circuit Case Law Following KSR*, 20 FED. CIR. B.J. 369, 370, 407 (2011) (concluding that *KSR* had made it easier to find invalidity for obviousness); Jason Rantanen, *The Federal Circuit's New Obviousness Jurisprudence: An Empirical Study*, 16 STAN. TECH. L. REV. 709, 764 (2013) (“[T]he Federal Circuit has indeed found patents and applications to be obvious at a higher rate than it did prior to *KSR* . . .”).

61. 35 U.S.C. § 112 (2012).

62. *Biosig Instruments, Inc. v. Nautilus, Inc.*, 715 F.3d 891, 898 (Fed. Cir. 2013), *rev'd*, 134 S. Ct. 2120 (2014); *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1348 (Fed. Cir. 2005).

63. *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2124 (2014).

64. *Id.* at 2129.

65. See Janet M. Smith, Note, *Indefiniteness as an Invalidity Defense*, 58 WM. & MARY L. REV. 1403, 1431 (2017); Norris Boothe, Note, *Exercising a Duty of Clarity: Nautilus, Inc. v. Biosig Instruments, Inc.*, 30 BERKELEY TECH. L.J. 445, 463–64 (2015).

Whatever the degree of change, patents are harder to obtain and easier to invalidate. To that extent, businesses have less reason to patent.

## 2. The Supreme Court Made Infringement More Difficult to Establish

A 2010 study concluded that a key reason why businesses avoided seeking patent protection was that it was difficult to prove infringement, owing to both the narrow nature of patent claims and the ability of competitors to design around them.<sup>66</sup> In a series of cases, the Supreme Court has made it even easier for competitors to avoid infringement. This took three forms.

First, the Court restricted the scope of a patentee to establish that a competitor's product, although not literally infringing a patent, nonetheless infringed because it was an "equivalent."<sup>67</sup> The Court made it harder for a patentee to show that a competitor "induced" a customer to infringe a patent.<sup>68</sup> And, in addition, the Court made it easier for competitors to avoid infringement by combining components of a patented combination only after they were shipped abroad.<sup>69</sup>

A rudimentary understanding of patent claims and prosecution is necessary to understand the first limitation. The USPTO does not determine that a patent application, as a whole, should be issued as a patent but instead examines each claim in a patent application to determine whether it meets the requirements of the Patent Act.<sup>70</sup> Among other things, the USPTO should not allow a claim to issue in a patent if it determines that the invention as described in the claim is not new or would have been obvious compared to the prior art. Generally speaking, this requires the USPTO to interpret the claim and then to determine whether, as interpreted, what it claims is different from what was publicly known at the time the application was filed and, if so, whether those differences would have been obvious at the time of the invention.

If the USPTO allows a patent claim without ever having rejected it, that claim can be infringed if the patentee proves a single defendant<sup>71</sup> made a product literally covered by the claim or infringed

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66. Sichelman & Graham, *supra* note 16, at 170.

67. *See infra* notes 71–77 and accompanying text.

68. *See infra* notes 78–81 and accompanying text.

69. *See infra* notes 94–106 and accompanying text.

70. *See* 37 C.F.R. § 1.104(c) (2017).

71. As discussed below, in some instances, if one person infringes a patent, another person can be liable as an infringer if she contributed to or induced that infringement. *See infra* notes 77–78 and accompanying text.

the patent under the “doctrine of equivalents.”<sup>72</sup> By way of simple example, if a patent claim covered “a pizza comprising dough, covered by sauce, covered by cow’s milk cheese,” an accused infringer’s cheese pizza would literally infringe that claim. If the accused infringer used a mixture of goat’s cheese and cow’s cheese, the patentee could argue that the mixture was “equivalent” to the claimed “cow’s milk cheese.”

If the USPTO determines a claimed invention is the same as what was already known in the prior art, it rejects the claim.<sup>73</sup> Likewise, if it determines that, although different from the prior art, the claim covers something that would have been obvious over the prior art, the USPTO typically rejects it.<sup>74</sup> A patent applicant can choose to “traverse” a rejection—by arguing that the claim is narrower than the USPTO believes or that the prior art impermissibly fails to disclose what the applicant claims—or the applicant can amend the claim, narrowing it to no longer cover what was known or obvious in the prior art.<sup>75</sup>

Amendments cost money and delay prosecution,<sup>76</sup> and they have always created the potential for any resulting narrowed claim to not have as wide a range of equivalents as an unamended claim.<sup>77</sup> In a perfect world, therefore, lawyers for patent applicants would include claims that are exactly as broad as the prior art allows.

The reality is that patent examiners routinely reject claims for lack of novelty or for being obvious. This is not because patent lawyers routinely do bad jobs. Instead, it is because of one of the two reasons noted above—the USPTO reads the claim more broadly than did the lawyer or it reads the prior art more broadly—or a third reason: the USPTO has found prior art that the lawyer did not know of. As a result, it is common for claims to be amended. Consequently, the harder it is for a business to prove infringement of an amended claim, the less reason businesses have to patent.

The Supreme Court made it more difficult to prove infringement of an amended claim when it overruled Federal Circuit precedent applying what is called “prosecution history estoppel”—also known as “file wrapper estoppel”—in *Festo Corp. v. Shoketsu Kinzoko*

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72. See generally Lee Petherbridge, *On the Decline of the Doctrine of Equivalents*, 31 CARDOZO L. REV. 1371 (2010).

73. See 37 C.F.R. § 1.104(c).

74. See *id.*

75. See 37 C.F.R. § 1.132.

76. See LAW PRACTICE MGMT. COMM., *supra* note 12, at 30 (identifying the costs of preparing amendments and responses to office actions rejecting a claim).

77. See *infra* notes 78–81 and accompanying text.

*Kogyo Kabushiki Co.*<sup>78</sup> In that case, the Supreme Court imposed a burden on the patentee who had amended a claim to show that the amendment did not surrender the particular equivalent in question.<sup>79</sup> Put in terms of pizza, suppose that as originally filed, the claim had stated, “a pizza comprising dough, covered by sauce, covered by cheese,” but had been rejected as “old” by the examiner. In response, the applicant had amended it to avoid the prior art to state “a pizza comprising dough, covered by sauce, covered by *cow’s milk cheese*,” and, as amended, the claim issued. If the patentee then sued a pizza maker who used a mixture of goat and cow cheese, the patentee would have to show that it had not surrendered claiming it. Under *Festo*, the patentee can rebut the presumption, but only by showing that the equivalent had not been foreseeable at the time of the amendment, that the rationale for the amendment was no more than tangentially related to the alleged equivalent, or that there had been “some other reason” that the patentee could not reasonably have been expected to have described the equivalent.<sup>80</sup>

Given that patent claims are routinely narrowed during prosecution, *Festo* limited the scope of many patent claims. Specifically, empirical studies show that it was far less likely for infringement to be found by equivalents after *Festo*. Accordingly, it curtailed the coercive rights of patent owners.<sup>81</sup> Businesses avoid patenting because of the perception that infringement is difficult to prove, and the Supreme Court made proving infringement even harder.

The Supreme Court also made infringement more difficult to establish by narrowing the scope of what constitutes “induced” infringement. In addition to making a party who infringes a patent liable to the patentee, the Patent Act imposes liability on a party who, while not itself infringing, induces another person to do so.<sup>82</sup> Thus, for example, a patentee can recover from a defendant who did not itself perform every step of a patented method, but who induced another to perform the patented method.<sup>83</sup>

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78. See *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 740–42 (2002); see also T. Whitney Chandler, Note, *Prosecution History Estoppel, the Doctrine of Equivalents, and the Scope of Patents*, 13 HARV. J.L. TECH. 465, 466 (2000).

79. *Festo Corp.*, 535 U.S. at 740.

80. *Id.* at 740–41.

81. See, e.g., John R. Allison & Mark A. Lemley, *The (Unnoticed) Demise of the Doctrine of Equivalents*, 59 STAN. L. REV. 955, 966–69 (2007); see also Petherbridge, *supra* note 72, at 1387, 1390, 1394–95.

82. 35 U.S.C. § 271(b) (2012).

83. See *Mirror Worlds, LLC v. Apple, Inc.*, 692 F.3d 1351, 1359–60 (Fed. Cir. 2012).

In two of three decisions, the Court narrowed the scope of inducement. In the first case, *Global-Tech Appliances, Inc. v. SEB S.A.*,<sup>84</sup> the Court rejected the Federal Circuit's view that inducement could occur either if the defendant knew that a patent would be infringed or if it merely knew of a risk that infringement would occur. The Court held that inducement requires proof that the defendant knew of the patent and knew the induced acts would infringe.<sup>85</sup> In the second case, *Limelight Networks, Inc. v. Akamai Technologies, Inc.*, the Court narrowed induced infringement in another way.<sup>86</sup> The Federal Circuit held that a defendant could induce infringement of a method claim if it "carries out some steps constituting a method patent and encourages others to carry out the remaining steps."<sup>87</sup> The Supreme Court reversed and held that unless one person carried out all of the steps, there was *no infringement* and, without infringement, there could be no inducement of any infringement.<sup>88</sup> The Court reached this holding while recognizing that its ruling would permit a competitor to evade liability by dividing performance of a patented method with a party it does not control.<sup>89</sup> However, in *Commil USA, LLC v. Cisco Systems, Inc.*,<sup>90</sup> the Court slightly expanded liability for inducement by narrowing available defenses.<sup>91</sup> The Federal Circuit held that a party could avoid liability for induced infringement if it had a good faith belief that either the acts it was inducing did not infringe *or* that the patent was invalid.<sup>92</sup> The Court held that a good faith belief in invalidity was not a defense.<sup>93</sup>

Not only did the Court narrow the scope of infringement by equivalents and make it more difficult to prove induced infringement, the Court made it more difficult to prove infringement in cases involving acts occurring overseas. Generally, patent infringement must occur in the United States, but the Patent Act contains exceptions that create liability for extraterritorial acts.<sup>94</sup> The Court narrowed the scope of extraterritorial infringement in two cases.

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84. *Global-Tech Appliances, Inc. v. SEB S.A.*, 563 U.S. 754, 766 (2011).

85. *Id.* at 763–64, 766.

86. *Limelight Networks, Inc. v. Akamai Techs., Inc.*, 134 S. Ct. 2111, 2117 (2014).

87. *Id.* at 2116; *see also* Lynda J. Oswald, *The "Strict Liability" of Direct Patent Infringement*, 19 VAND. J. ENT. & TECH. L. 993, 996 (2017).

88. *Limelight Networks*, 134 S. Ct. at 2117–18.

89. *Id.* at 2119.

90. *Commil USA, LLC v. Cisco Sys., Inc.*, 135 S. Ct. 1920, 1929 (2015).

91. *See id.*

92. *Id.* at 1925.

93. *Id.* at 1929, 1931.

94. 35 U.S.C. § 271(f)–(g) (2012).

In the first, *Microsoft Corp. v. AT&T Corp.*,<sup>95</sup> the Court analyzed Section 271(f) of the Patent Act, which provides that infringement occurs when one “suppl[ies] . . . from the United States,” a patented invention’s “components” for “combination” abroad.<sup>96</sup> The Federal Circuit held that Microsoft was liable for infringement of an AT&T patent because AT&T had provided a copy of Microsoft’s patented software to foreign manufacturers, and those manufacturers installed the infringing software on computers sold abroad.<sup>97</sup> The Court reversed, holding that because Microsoft did not supply the actual copy of the software installed, merely a master disk from which the manufacturers made the copies, Microsoft did not supply a “component.”<sup>98</sup>

The Court also narrowed the scope of what acts occurring abroad could constitute infringement in *Life Technologies Corp. v. Promega Corp.*<sup>99</sup> In that case, the Court analyzed the provision of the Patent Act that makes it an act of infringement for someone to supply from the United States “all or a substantial portion” of the components of an invention patented in the United States while knowing that the components are to be assembled abroad in a manner that, if done in the United States, would infringe that patent.<sup>100</sup> In *Life Technologies*, the patentee alleged that a defendant that had supplied one component of a product infringed a patent claim covering a multicomponent product.<sup>101</sup> The jury found infringement, and the Federal Circuit reversed the district court’s grant of judgment as a matter of law to the defendant, reinstating the verdict.<sup>102</sup> In doing so, the Federal Circuit held that one component could be “a substantial portion” of a multicomponent patented invention if that component was sufficiently important to the invention, meaning if it was qualitatively substantial.<sup>103</sup> The Supreme Court reversed, instead holding that “substantial portion” required a quantitative assessment.<sup>104</sup> The Court further held that the supplier of one

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95. *Microsoft Corp. v. AT&T Corp.*, 550 U.S. 437, 441 (2007) (quoting 35 U.S.C. § 271(f)(1) (2012)).

96. 35 U.S.C. § 271(f)(1); *see Microsoft*, 550 U.S. at 442.

97. *Id.* at 446–47, 452.

98. *Id.* at 442, 458–59.

99. *See Life Techs. Corp. v. Promega Corp.*, 137 S. Ct. 734, 737 (2017) (citing 35 U.S.C. § 271(f)(1)).

100. *Id.*

101. *Id.* at 738.

102. *Id.* at 739.

103. *See id.*

104. *Id.* at 743. Chief Justice Roberts did not participate in considering or deciding the case; Justices Alito and Thomas concurred in part and in the judgment. *Id.*

component as a matter of law could never be liable for infringement under this provision of the Patent Act.<sup>105</sup>

Thus, the Court made it more difficult to establish infringement and narrowed the scope of what can infringe. The net effect reduced the scope of patent infringement, which in turn reinforced a key reason why businesses avoided patenting.<sup>106</sup> Although the next topic, exhaustion, relates to infringement, it is somewhat distinct; however, the Court's decisions on that topic likewise made it more difficult to show infringement.

### 3. The Supreme Court Expanded the Doctrine of "Exhaustion" of Patent Rights

While, as explained above, a patentee has the right to obtain damages from someone who infringes a valid patent, the authorized sale by a patentee of a product "exhausts" the patentee's rights in the product.<sup>107</sup> To return to pizza, if the owner of a patent on pizza sells the pizza to a consumer and that consumer sells it to a third party, the patentee cannot sue that third party. The patentee is deemed to have "exhausted" its patent rights by selling the patented product: the power of coercion ends when the rights are "exhausted" by first sale of the patented product.<sup>108</sup>

In two cases, the Court made it easier for patent rights to become exhausted, narrowing the scope of patent protection. In the first case, *Quanta Computer Corp. v. LG Electric, Ltd.*, the Federal Circuit held that the exhaustion doctrine did not apply to method claims at all.<sup>109</sup> The Court reversed, holding that the sale of a product that embodies the method exhausts the patents.<sup>110</sup>

The second case, *Impression Productions, Inc. v. Lexmark International, Inc.*,<sup>111</sup> addressed whether manufacturers could avoid

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105. *Id.*

106. The Court decided other cases that limit the scope of patent infringement. The foremost example is *Teva Pharmaceuticals USA, Inc. v. Sandoz, Inc.*, in which the Court reversed the Federal Circuit's approach to reviewing interpretation of a claim de novo and instead held that the Federal Circuit should review lower courts' reliance on extrinsic evidence for clear error. 135 S. Ct. 831, 836–37 (2015). While this is a facially neutral decision—it does not narrow the scope of a patent claim—it does take power away from the Federal Circuit. *See id.* In another case, *Merck KGaA v. Integra Lifesciences I, Ltd.*, the Court rejected the Federal Circuit's view of the "safe harbor" provision in 35 U.S.C. § 271(e)(1), which exempts certain drug testing from patent infringement claims. *See* 45 U.S. 193, 206–07 (2005).

107. *Impression Prods., Inc. v. Lexmark Int'l, Inc.*, 137 S. Ct. 1523, 1535 (2017).

108. *See id.*

109. *Quanta Comput. Corp. v. LG Elec., Ltd.*, 553 U.S. 617, 621 (2008).

110. *Id.*

111. *Impression Prods.*, 137 S. Ct. at 1529.

exhaustion by inserting restrictive contractual provisions on the original purchaser's rights, such as prohibiting any resale of the manufacturer's product—for example, “resale of this pizza is expressly prohibited.” In that case, a manufacturer of printer cartridges for laser printers, Lexmark,<sup>112</sup> contractually prohibited purchasers from reusing its cartridges and prohibited their resale.<sup>113</sup> However, other companies called “remanufacturers” bought the used cartridges from consumers and then refurbished and resold them.<sup>114</sup> Lexmark sold some of the cartridges in the United States with the restriction on resale, but others were sold to foreign consumers without the restriction and then purchased by the remanufacturers who imported them into the United States.<sup>115</sup> Lexmark sued the remanufacturers for patent infringement, arguing that domestic consumers were bound not to resell the cartridges and that an unrestricted sale abroad did not exhaust domestic patent rights.<sup>116</sup>

The Federal Circuit in an en banc decision held the remanufacturers' activities both in and outside the United States infringed Lexmark's patent.<sup>117</sup> As to domestic sales, the court reasoned that because the remanufacturers knew of the restrictions—which were lawful—their sales were “without authority” of Lexmark and so constituted infringement under 35 U.S.C. § 271(a), which provides that “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.”<sup>118</sup> With respect to products Lexmark sold abroad but then imported into the United States, the court reasoned that only an authorized sale in the United States exhausted US patent rights.<sup>119</sup> Thus, the Federal Circuit allowed the patentee to keep its coercive rights intact.

The Supreme Court reversed both holdings. With respect to domestic sales, it held that the sale “terminates all patent rights to that item” and functions “automatically.”<sup>120</sup> The Court stated that, while Lexmark might have contractual remedies against domestic consumers who sold their cartridges to the remanufacturers, it had no

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112. *Id.* at 1529–30.

113. *Id.*

114. *Id.*

115. *Id.* at 1530.

116. *Id.*

117. *Lexmark Int'l, Inc. v. Impression Prods., Inc.*, 816 F.3d 721, 773–74 (Fed. Cir. 2016) (en banc), *rev'd*, 137 S. Ct. 1523 (2017).

118. *Id.* at 773–74; *see also* 35 U.S.C. § 271(a) (2012).

119. *Lexmark Int'l*, 816 F.3d at 742.

120. *Impression Prods.*, 137 S. Ct. at 1531, 1535.

patent rights after the sale.<sup>121</sup> The Court reached the same “straightforward” result with respect to the cartridges sold by Lexmark abroad, holding that “[a]n authorized sale outside the United States, just as one within the United States, exhausts all rights under the Patent Act.”<sup>122</sup>

Collectively, these cases narrowed the right to exclude by narrowing what constitutes infringement. The sale of a product “embodying” a method claim no longer infringes. Nor can a patentee assert infringement based upon violation of sale or use restrictions by an original purchaser.<sup>123</sup>

#### 4. The Supreme Court Made Asserting Patents Riskier and More Difficult

The Court has reversed the Federal Circuit in key cases relating to both substantive and procedural patent law, each of which made patent litigation more difficult or riskier for the patent owner.<sup>124</sup> It did this in various ways.

First, the Supreme Court increased the number of potential challengers to a patent by allowing even those who took a license under a patent to challenge its validity while continuing to honor the license. In *MedImmune, Inc. v. Genentech, Inc.*, the Federal Circuit held that federal courts lacked subject matter jurisdiction to issue a declaratory judgment that a patent was invalid if the declaration was sought by a licensee who was continuing to pay a royalty for a licensed patent.<sup>125</sup> The only way a licensee could sue for a declaration of invalidity was to breach the license by stopping payment, and only then if it were subject to an actual threat of infringement litigation.<sup>126</sup>

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121. *Id.* at 1535.

122. *Id.*

123. The impact of the Supreme Court’s narrowing of what constitutes infringement will vary by industry. Some industries—pharmaceuticals, for example—may be able to rely upon import restrictions to prevent importation into the United States of products sold abroad. *See, e.g., Importation of Drugs Outline*, U.S. FOOD & DRUG ADMIN. (Sept. 7, 2012), <https://www.fda.gov/Drugs/GuidanceComplianceRegulatoryInformation/ImportsandExportsCompliance/ucm297872.htm> [<https://perma.cc/6J6L-VMMP>].

124. The Supreme Court also made patent litigation riskier when it decided *Cuozzo Speed Technologies, LLC v. Lee*, which held that the USPTO had the power to enact regulations which make it easier to challenge issued patents. 136 S. Ct. 2131, 2142 (2016). The substantive rules at issue in that decision are discussed below. *See infra* notes 185–92 and accompanying text.

125. *MedImmune, Inc. v. Genentech, Inc.*, 427 F.3d 958, 961, 963 (2005), *rev’d*, 549 U.S. 118 (2007).

126. *See id.* at 962–63.

The Supreme Court reversed.<sup>127</sup> The Court permitted a licensee to sue for a declaratory judgment of invalidity even while continuing to pay under the license.<sup>128</sup> This allowed the licensee to avoid the consequences of breaching the license, thus enabling a party to avoid breaching the license while challenging the validity of the licensed patent.<sup>129</sup> In a related case, the Court also rejected the Federal Circuit's holding that a licensee bears the burden to show infringement if it seeks a declaration that its products do not infringe, holding instead that the patentee must establish infringement of the licensed products.<sup>130</sup>

Second, in *TC Heartland LLC v. Kraft Food Groups Brands LLC*,<sup>131</sup> the Court made it more difficult to enforce a patent by significantly reducing which districts could serve as proper venue for patent infringement suits. The Federal Circuit held in 1990 that venue in a patent suit was appropriately placed in any district in which a defendant had a regular place of business.<sup>132</sup> That decision permitted patent suits against corporations in many federal district courts, therefore allowing patentees to “forum shop.”<sup>133</sup> The Federal Circuit's interpretation allowed patentees to file suits in the Eastern District of Texas and other districts even when the suit and defendant had very little connection to the venue, which led to criticisms of those districts as having become cottage industries for abusive patent infringement suits brought by patent assertion entities.<sup>134</sup>

In *TC Heartland*, the Supreme Court reversed the Federal Circuit's twenty-five-year-old interpretation, thus markedly reducing the proper venues to file patent infringement suits. This reduced the

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127. *MedImmune, Inc. v. Genentech, Inc.*, 549 U.S. 118, 137 (2007).

128. *See id.*

129. *See* Alan D. Miller & Michal S. Gal, *Licensee Patent Challenges*, 32 YALE J. REG. 122, 127 (2015) (discussing other contractual provisions that might prevent licensee challenges).

130. *Medtronic, Inc. v. Mirowski Family Ventures, LLC*, 134 S. Ct. 843, 846 (2014).

131. *TC Heartland LLC v. Kraft Foods Group Brands LLC*, 137 S. Ct. 1514, 1517 (2017).

132. *VE Holding Corp. v. Johnson Gas Appliance Co.*, 917 F.2d 1574, 1577–78, 1584 (Fed. Cir. 1990).

133. Kimberly A. Moore, *Forum Shopping in Patent Cases: Does Geographic Choice Affect Innovation?*, 79 N.C. L. REV. 889, 897 (2001). Then-Professor Moore was appointed to the Federal Circuit in 2006. *Kimberly A. Moore, Circuit Judge*, U.S. CT. APPEALS FOR FED. CIR., <http://www.cafc.uscourts.gov/judges/kimberly-moore-circuit-judge> [https://perma.cc/7DBF-TMKN] (last visited Sept. 19, 2017).

134. *See* Brian J. Love & James Yoon, *Predictably Expensive: A Critical Look at Patent Litigation in the Eastern District of Texas*, 20 STAN. TECH. L. REV. 1, 6–8 (2017); Lemley, *supra* note 15, at 4–6; *see also* Laura Powell, *Will Patent Litigation Still Be Big in Texas? The Supreme Court Hears Arguments for TC Heartland v. Kraft Foods Group Brands*, VAND. J. ENT. & TECH. L. BLOG (Mar. 28, 2017), <http://www.jetlaw.org/2017/03/28/will-patent-litigation-still-be-big-in-texas-the-supreme-court-hears-arguments-for-tc-heartland-v-kraft-foods-group-brands/> [https://perma.cc/JV69-4C6H].

ability of patentees to sue in districts that they might perceive as more patentee friendly, such as the Eastern District of Texas. To the extent that a broader range of proper venues allowed patentees to obtain greater recoveries, and in the marginal case where suit could not be economically brought in the fewer remaining proper venues, the decision in *TC Heartland* reduced the value of patents to obtain coercive relief.<sup>135</sup> Further, while it was easy for patentees to have proper venue in many district courts prior to *TC Heartland*, not only are fewer venues proper, but identifying which venue is proper can be expensive and, in some instances, uncertain—meaning that defendants can choose to increase enforcement costs by contesting venue.<sup>136</sup>

To understand the impact of the next few cases requires a brief overview of patent litigation costs. Patent litigation is very expensive—median costs have generally ranged from around \$600,000 for cases worth less than \$1 million, to about \$2 million for cases valued in the \$10–\$25 million range.<sup>137</sup> If the general rule is that each side must bear its own costs, then the patentee has the leverage of the cost: if the accused infringer does not settle, the worst thing that could happen to the patentee is that it will bear its own costs. The costs to non-practicing entities are lower than for operating businesses for two reasons. First, they likely have fewer documents, witnesses, and other evidentiary burdens to bear, and second, their attorneys often work on a contingent fee basis. Some argue that these asymmetrical costs allowed patentees to extract unfair settlements in weak cases.<sup>138</sup> But if a losing patentee can be forced to bear the other side's costs, then that leverage is reduced; therefore, increasing the likelihood that a

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135. See Emiliano Giudici & Justin Blount, *Evaluating Market Reactions to Non-Practicing Entity Litigation*, 20 VAND. J. ENT. & TECH. L. 51, 73 n.144 (2017); Ana Santos Rutschman, *Patent Venue Exceptionalism After TC Heartland v. Kraft*, 25 U. MIAMI BUS. L. REV. 29, 38–39 (2017).

136. For a discussion of the uncertainties of identifying proper venue for entities under the general venue statute, see John P. Lenich, *A Simple Question That Isn't So Simple: Where Do Entities Reside for Venue Purposes?*, 84 MISS. L.J. 253 (2015).

137. LAW PRACTICE MGMT. COMM., *supra* note 12, at 41. *But see infra* note 184 and accompanying text.

138. *E.g.*, *Protecting Small Businesses and Promoting Innovation by Limiting Patent Troll Abuse: Hearing Before S. Comm. on the Judiciary*, 113th Cong. 1–2 (2013) (statement of Dana Rao, Vice President & Associate General Counsel of Intellectual Property and Litigation, Adobe Systems Incorporated) (“Bad actors are taking advantage of asymmetrical costs of patent litigation to pressure defendants into settlements.”); Randall R. Rader, Colleen V. Chien & David Hricik, Opinion, *Make Patent Trolls Pay in Court*, N.Y. TIMES, June 5, 2013, at A5, <http://www.nytimes.com/2013/06/05/opinion/make-patent-trolls-pay-in-court.html?mcubz=1> [<https://perma.cc/4BGY-QD7F>].

patentee will be ordered to pay the attorneys' fees of the accused infringer makes patent enforcement riskier, reducing leverage.

The Court recently did exactly that. Section 285 of the Patent Act has long permitted a district court to award fees to a prevailing party—either a prevailing patentee or infringer—in “exceptional cases.”<sup>139</sup> In 2005, the Federal Circuit held that a court could award the prevailing party attorneys' fees only if it showed clear and convincing evidence that the loser's case was both objectively baseless and had been subjectively litigated in bad faith.<sup>140</sup> Ten years later, the Court in *Octane Fitness, LLC v. Icon Health & Fitness, Inc.* rejected that interpretation, stating that the Federal Circuit's interpretation of Section 285 was so demanding that it rendered the statute “largely superfluous.”<sup>141</sup>

Instead, the Court interpreted Section 285 to more readily permit fee shifting by holding that a prevailing party could obtain fees if the district judge found by preponderant evidence that the case had been merely “‘uncommon,’ ‘rare,’ or ‘not ordinary,’” or if it was “‘simply one that stands out from others with respect to the substantive strength of a party's litigating position (considering both the governing law and the facts of the case) or the unreasonable manner in which the case was litigated.’”<sup>142</sup> A study published two years after *Octane* found that the number of requests for attorneys' fees had increased around 50 percent, and actual awards had increased around 100 percent.<sup>143</sup>

On its face, the impact of *Octane Fitness* on the coercive power of patents is neutral, since its same relaxed standard applies whether the patent owner or accused infringer prevailed. However, there are two points to note. First, *Octane Fitness* was decided when the Court was concerned about “patent trolls” and their ability to leverage the coercive power of patents with the costs of litigation to extract unfair settlements.<sup>144</sup> Second, and consistent with the view that the decision

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139. 35 U.S.C. § 285 (2012).

140. *Brooks Furniture Mfg., Inc. v. Dutailier Int'l, Inc.*, 393 F.3d 1378, 1381 (Fed. Cir. 2005).

141. *Octane Fitness, LLC v. Icon Health & Fitness, Inc.*, 134 S. Ct. 1749, 1758 (2014).

142. *Id.* at 1756.

143. See Scott M. Flanz, *Octane Fitness: The Shifting of Patent Attorneys' Fees Moves into High Gear*, 19 STAN. TECH. L. REV. 329, 347 (2016); Lionel M. Lavenue, Sean D. Damon & R. Benjamin Cassady, *Making the Nonprevailing Party Pay: The Statistics of Exceptional Cases Two Years After Octane and Highmark*, LANDSLIDE, July–Aug. 2016, at 26, [https://www.americanbar.org/publications/landslide/2015-16/july-august/making\\_nonprevailing\\_party\\_pay\\_statistics\\_exceptional\\_cases\\_two\\_years\\_after\\_octane\\_and\\_highmark.html](https://www.americanbar.org/publications/landslide/2015-16/july-august/making_nonprevailing_party_pay_statistics_exceptional_cases_two_years_after_octane_and_highmark.html) [<https://perma.cc/W9UZ-G92S>].

144. See Aria Soroudi, Note, *Defeating Trolls: The Impact of Octane and Highmark on Patent Trolls*, 35 LOY. L.A. ENT. L. REV. 319, 351 (2015).

was directed toward reducing the power of patentees, “*Octane* drastically increased the rate that accused infringers’ motions are being granted, while slightly decreasing the rate that patentees’ fees motions are being granted.”<sup>145</sup> Thus, “accused infringer defendants should rationally be emboldened to litigate a suit, while patentee plaintiffs will rationally be more hesitant to file suits.”<sup>146</sup> Finally, subjecting a small entity, including a typical patent enforcement entity, to the potential for paying millions of dollars in fees makes patent litigation less effective.<sup>147</sup>

The consequence of these decisions, separately and as a whole, is to make patent litigation more difficult and riskier.<sup>148</sup> That fact reduces the coercive power of patents, which, in turn, reduces the incentive to file for a patent as well as the value of already-issued patents in any secondary market.<sup>149</sup>

##### 5. The Supreme Court Rejected Generally Granting Successful Patentees Injunctions Against Infringement and Limited Design Patent Damages but Increased Potential Damages in Specific Circumstances

The Supreme Court has issued recent opinions affecting remedies for patent infringement—the heart of the coercive patent power. While two decisions favored patentees, they are narrow in scope and have a much smaller impact than the key decision which substantially altered the fundamental property right inherent in a property—namely, the right to exclude others.

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145. Flanz, *supra* note 143, at 362.

146. *Id.*; see also Lavenue, Damon & Cassady, *supra* note 143; Hannah Jiam, Note, *Fee-Shifting and Octane Fitness: An Empirical Approach Toward Understanding “Exceptional”*, 30 BERKELEY TECH. L.J. 611, 640–41 (2015).

147. Decided in the same term as *Octane Fitness*, *Highmark Inc. v. Allcare Health Management Systems, Inc.* vacated the Federal Circuit’s holding that a determination that a case was exceptional should be reviewed de novo, holding instead that an abuse of discretion standard applies. 134 S. Ct. 1744, 1749 (2014). While this is a neutral rule—giving discretion to a district judge does not, on its face, seem antipatent—it does reduce the ability of the Federal Circuit to reverse district courts. Assuming the Court believes the Federal Circuit favors patentees too much, this decision deprives the Federal Circuit of the ability to reverse district judges who may not share that bias.

148. The degree to which these decisions have done so is subject to debate, since they are new, the data thin, and self-selection a problem. See, e.g., Lemley, *supra* note 15, at 25, 28–29 (arguing that selection effect could not explain why win rate has remained constant).

149. RICHARDSON, *supra* note 52, at 2 (noting that “litigation risk” was “much higher than previously reported”).

A patent is a form of property,<sup>150</sup> and the sine qua non of property is the right of the owner to exclude others from using it, not to merely obtain damages from someone who uses the property without the owner's consent.<sup>151</sup> Consistent with that belief, the Federal Circuit held in *MercExchange, LLC v. eBay, Inc.* that "the general rule is that a permanent injunction will issue once infringement and validity have been adjudged," thus permitting denial only in unusual circumstances, which the court stated might include "when a patentee's failure to practice the patented invention frustrates an important public need for the invention, such as the need to use an invention to protect public health."<sup>152</sup> In that case, after a jury found that eBay infringed a valid patent owned by MercExchange, the district court denied entry of a permanent injunction in part because MercExchange did not actually practice the invention but instead was (what is now called) a non-practicing entity.<sup>153</sup> The Federal Circuit reversed the denial of injunctive relief, instead applying its general rule.<sup>154</sup>

The Supreme Court unanimously vacated the decision of the Federal Circuit.<sup>155</sup> In doing so, the Court rejected the Federal Circuit's "general rule" that an injunction should follow a finding of infringement of a valid patent and instead required that district courts apply the traditional four-factor test applied in equity.<sup>156</sup> By

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150. *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983) ("[A] patent is a form of property right, and the right to exclude recognized in a patent is but the essence of the concept of property.").

151. A property right permits an owner to refuse to permit others to use the property, while a liability rule allows the others to use the property, subject to paying damages. *See, e.g.*, Ryan T. Holte & Christopher B. Seaman, *Patent Injunctions on Appeal: An Empirical Study of the Federal Circuit's Application of eBay*, 92 WASH. L. REV. 145, 160 (2017) ("Under a property rule, an entitlement can only be taken or transferred with the owner's consent, which the owner is free to withhold . . . [but a] liability rule denies the holder of the [property or right] the power to exclude others." (quoting Richard A. Epstein, *A Clear View of the Cathedral: The Dominance of Property Rules*, 106 YALE L.J. 2091, 2091 (1997))); Mark A. Lemley & Eugene Volokh, *Freedom of Speech and Injunctions in Intellectual Property Cases*, 48 DUKE L.J. 147, 211 (1998) ("Our approach is therefore consistent with the traditional view that intellectual property should be protected by means of a property rule (a presumptive entitlement to injunctive relief) rather than a liability rule.").

152. *MercExchange, L.L.C. v. eBay, Inc.*, 401 F.3d 1323, 1338 (Fed. Cir. 2005), *rev'd*, 547 U.S. 388 (2006) (internal quotation marks omitted).

153. *Id.* at 1326, 1338; *see also* Marketa Trimble, *Foreigners in US Patent Litigation: An Empirical Study of Patent Cases Filed in Nine US Federal District Courts in 2004, 2009, and 2012*, 17 VAND. J. ENT. & TECH. L. 175, 183–84 (2014) (stating that non-practicing entities do not invent or manufacture patents).

154. *MercExchange*, 401 F.3d at 1339.

155. *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 394 (2006).

156. *See id.* at 394–95.

rejecting the Federal Circuit's general rule, the Court plainly made it more difficult for a patentee to obtain injunctive relief.<sup>157</sup> Patentees cannot rely on the general rule to be that they have the right to exclude; they instead have the right to seek damages from those who use their property and, perhaps, may obtain injunctive relief.<sup>158</sup>

The impact of *eBay* has been uneven. Studies have confirmed that district courts are less likely to grant non-practicing entities injunctive relief after *eBay*, and some commentators view district courts as having “effectively interpreted the decision to create de facto rules denying injunctive relief to certain categories of patentees like non-competitors and non-practicing entities.”<sup>159</sup> Data show that non-practicing entities obtain injunctions against continued infringement between 7 percent and 16 percent of the time.<sup>160</sup> Although limited data suggest that the Federal Circuit is likely to reverse denials, the fact that a non-practicing entity has about a 10 percent chance of obtaining a permanent injunction from a district court impacts the secondary market. To that extent, the value of a patent is reduced and, further, it reduces the incentive to file for a patent in the first instance. Thus, the Court's *eBay* decision reduced the coercive power of patents, and so the incentive to patent.

The Court also adopted a less generous approach than had the Federal Circuit to determine the measure of damages for design patents. In *Samsung Electronics Co. v. Apple Inc.*, Apple sued Samsung for infringement of a design patent depicting the front face of an iPhone.<sup>161</sup> By statute, the owner of a design patent is entitled to recover the “total profit” made by the maker of an infringing “article of manufacture.”<sup>162</sup> A jury awarded Apple \$399 million—representing Samsung's entire profit from sales of infringing phones.<sup>163</sup> The

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157. Niels J. Melius, Note, *Trolling for Standards: How Courts and the Administrative State Can Help Deter Patent Holdup and Promote Innovation*, 15 VAND. J. ENT. & TECH. L. 161, 161 (2012) (arguing that the Supreme Court's *eBay* decision “muddied the precedential waters” when advancing the four-factor test, which caused a district court split on injunctive relief eligibility).

158. When an injunction is denied, courts award damages for infringement occurring after the date of judgment. See, e.g., *Amado v. Microsoft Corp.*, 517 F.3d 1353, 1360 (Fed. Cir. 2008) (affirming award by district court using different measure of damages for post-judgment infringement than pre-judgment infringement).

159. Holte & Seaman, *supra* note 151, at 190. That trend is odd, given that the Court in *eBay* rejected the approach of the district court, which held that a non-practicing entity could never obtain injunctive relief. See *eBay*, 547 U.S. at 393. One study suggests that the Federal Circuit may be trying to fight that trend. See Holte & Seaman, *supra* note 151, at 190.

160. Holte & Seaman, *supra* note 151, at 200 n.274.

161. *Samsung Elecs. Co. v. Apple Inc.*, 137 S. Ct. 429, 433 (2016).

162. 35 U.S.C. § 289 (2012).

163. *Samsung*, 137 S. Ct. at 433.

Federal Circuit affirmed, reasoning that the “article of manufacture” was the entire phone because consumers could not buy components separately.<sup>164</sup>

The Supreme Court unanimously reversed.<sup>165</sup> It held that the fact that the components could not be purchased by consumers separately did not control whether the infringing phone was the “article of manufacture.”<sup>166</sup> However, the Court refused to “resolve whether . . . the relevant article of manufacture is the smartphone, or a particular smartphone component.”<sup>167</sup> Instead, the Court remanded, and in July 2017, the district court ordered the parties to provide briefs concerning who had the burden to identify the “article of manufacture” as well as the proper test for that identification.<sup>168</sup> By rejecting the Federal Circuit’s approach that design patent damages should be based upon the product purchased by the consumer, the Supreme Court reduced potential damages for infringement of design patents, and so the incentive to patent.<sup>169</sup>

However, in two cases the Court increased available remedies over the Federal Circuit’s approach. In the first case, *Halo Electronics, Inc. v. Pulse Electronics, Inc.*,<sup>170</sup> the Supreme Court rejected the restrictive approach of the Federal Circuit toward allowing “enhanced” damages to patentees who proved infringement.<sup>171</sup> Under Section 284 of the Patent Act, a district court “may increase” actual damages up to three times.<sup>172</sup> The Federal Circuit had held that damages could be increased only if the district court found by clear and convincing evidence that the accused infringer “acted despite an objectively high likelihood that its actions constituted infringement of a valid patent,” without regard to the accused infringer’s state of mind.<sup>173</sup> Thus, an accused infringer could

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164. *Id.* at 435–36.

165. *Id.* at 436.

166. *Id.* at 435.

167. *Id.* at 436.

168. *Apple Inc. v. Samsung Elecs. Co.*, No. 11-CV-01846-LHK, 2017 WL 3232424, at \*1, \*19 (N.D. Cal. July 28, 2017).

169. In another decision, arising out of an appeal from the Ninth Circuit, the Court reaffirmed its holding that a patent license could not impose royalties for sales made after the expiration of a patent. *Kimble v. Marvel Entm’t, LLC*, 135 S. Ct. 2401, 2405 (2015).

170. *Halo Elecs., Inc. v. Pulse Elecs., Inc.*, 136 S. Ct. 1923 (2016).

171. *Id.* at 1935–36.

172. 35 U.S.C. § 284 (2012).

173. *Halo Elecs.*, 136 S. Ct. at 1928; *see In re Seagate Tech., LLC*, 497 F.3d 1360, 1368, 1371 (Fed. Cir. 2007) (en banc).

avoid paying more than actual damages by showing it was not objectively reckless.<sup>174</sup>

The Supreme Court reversed, holding that the Federal Circuit had interpreted the statute too rigidly and had insulated an infringer from enhanced damages even if it infringed without relying on that defense, and did not know of that defense, but had an ingenious attorney who came up with a colorable defense.<sup>175</sup> Rejecting both the clear and convincing standard and the two-part test, the Court nonetheless cautioned district courts to reserve awards of enhanced damages “for egregious cases typified by willful misconduct.”<sup>176</sup> *Halo* clearly made it easier to recover enhanced damages upon proof of willful infringement of a valid patent and so, to that extent, expanded remedies.<sup>177</sup>

In the second case, the Court eliminated an equitable defense that otherwise barred recovery of certain damages. Under 35 U.S.C. § 286, a patentee may recover damages for infringement occurring within six years of filing the claim.<sup>178</sup> However, the Federal Circuit had held en banc in 1992, in *A.C. Aukerman Co. v. R.L. Chaides Construction Co.*,<sup>179</sup> that equity could prevent recovery even for damages within that six-year period if the defendant established that the patentee’s undue delay had caused it prejudice. The Supreme Court rejected that approach in 2017 in *SCA Hygiene Products Aktiebolag v. First Quality Baby Products, LLC*,<sup>180</sup> holding that there was no exception to the Patent Act available in equity. To that extent, the decision increased damages over the Federal Circuit’s approach.

Thus, although the Court expanded relief in two narrower ways—allowing for easier recovery of enhanced damages for willful infringement and eliminating laches as a bar to damages—the Court narrowed damages in other ways, and *eBay* fundamentally narrowed the coercive power of patents. As a result of *eBay*, patentees are less likely to obtain coercive injunctive relief against infringement.

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174. See *In re Seagate Tech.*, 497 F.3d at 1371.

175. *Halo Elecs.*, 136 S. Ct. at 1933.

176. *Id.* at 1934–35.

177. See Eileen Hintz Rumpfelt, *The Halo Effect: Enhanced Damages After Halo and Stryker*, DRI FOR DEF., Aug. 2017, at 75 (suggesting that the same increases in the number of requests for fee awards, and increases in the number of awards, after *Octane Fitness* will occur in willful infringement after *Halo*).

178. 35 U.S.C. § 286 (2012).

179. *A.C. Aukerman Co. v. R.L. Chaides Constr. Co.*, 960 F.2d 1020, 1035–36 (Fed. Cir. 1992) (en banc).

180. *SCA Hygiene Prods. Aktiebolag v. First Quality Baby Prods., LLC*, 137 S. Ct. 954, 965, 967 (2017).

*B. Congress Made It Easier and Cheaper to Challenge Patents in USPTO Proceedings Rather than Litigation and Created a Federal Alternative to Patent Protection, Thus Reducing the Coercive Power of Patents*

In the midst of the Supreme Court's decisions reducing patent protection, Congress weakened patents in two ways. One took the form of new post-grant administrative proceedings in the USPTO. Those proceedings made it easier and cheaper to challenge the validity of issued patents and provided a means to stay infringement litigation. The second took the form of increasing the strength of the primary alternative to patent protection—trade secret protection. Combined, the two substantially weakened patents and curtailed the ability of patentees to obtain coercive relief.

1. Post-Grant Proceedings Stripped Patents of the Presumption of Validity, Made Claims Broader and So Easier to Challenge, and Permitted Challengers to Avoid Litigation

Congress' creation of post-grant administrative proceedings has had, so far at least, the greatest measurable reduction in the strength of the coercive right. In 2012, Congress created three new post-grant proceedings that allow essentially anyone to request the USPTO to reassess the patentability of an issued patent.<sup>181</sup> Under this regime, anyone other than the patent owner may seek inter partes review (IPR) or post-grant review (PGR) of an issued patent or may seek review of a "covered business method" (CBM).<sup>182</sup>

The most significant impact on the strength of patents has, so far, come from IPR: indeed, 92 percent of the 7,306 post-grant proceedings that have been sought have been in the form of IPR.<sup>183</sup> Post-grant proceedings are substantially less expensive than

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181. See Laura Lydigsen, "Staying" Power: Litigation Stays Under the America Invents Act, DEL. LAW., Fall 2015, at 14.

182. See 35 U.S.C. § 311(a) (2012) (inter partes review); *id.* § 321(a) (post-grant review); Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 18(a)(1)(B), 125 Stat. 284, 329 (2011) (covered business methods); see also Lydigsen, *supra* note 181, at 14. This expansion of who can sue to challenge a patent is important: A party ordinarily cannot seek a declaration that a patent is invalid unless it faces a reasonable apprehension of being sued for patent infringement. See, e.g., Gen-Probe Inc. v. Vysis, Inc., 359 F.3d 1376, 1380, 1382 (Fed. Cir. 2004) (citing BP Chems. Ltd. v. Union Carbide Corp., 4 F.3d 975, 978 (Fed. Cir. 1993)). But there is no such requirement for instituting any post-grant proceeding. See Lydigsen, *supra* note 181, at 14–16.

183. See U.S. PATENT & TRADEMARK OFFICE, TRIAL STATISTICS IPR, PGR, CBM: PATENT TRIAL AND APPEAL BOARD (2017), [https://www.uspto.gov/sites/default/files/documents/Trial\\_Statistics\\_2017\\_07\\_31.pdf](https://www.uspto.gov/sites/default/files/documents/Trial_Statistics_2017_07_31.pdf) [<https://perma.cc/FAQ6-HNE5>].

defending a patent suit.<sup>184</sup> In addition, three features common to each proceeding, separately and together, make it demonstrably more likely that patents can be successfully challenged under these new post-grant proceedings than is the case in litigation. These three features are the lower evidentiary standard, the different claim construction rules, and the ability of a court to stay litigation pending the outcome of the post-grant proceeding.

First, the presumption of validity that applies in patent litigation, which requires clear and convincing proof of invalidity, does not apply in a post-grant proceeding. Instead, the USPTO can find a claim unpatentable merely based upon preponderant evidence.<sup>185</sup>

Second, in each post-grant proceeding, the USPTO gives each claim its broadest reasonable interpretation,<sup>186</sup> which as a general matter gives the claim a broader scope than it would receive in litigation.<sup>187</sup> As a result, a claim in litigation usually will be interpreted more narrowly and thus interpreted to not cover something in the prior art. Indeed, the Federal Circuit has held that, in litigation, patent claims should be construed to avoid invalidity.<sup>188</sup> In a post-grant proceeding, however, claims are read more broadly, therefore increasing the likelihood of a claim being invalid because it either covered something already in the prior art or is closer to something in that prior art. Accordingly, the claimed invention is neither “new” nor non-obvious. As one writer put it, “if the diameter of a bullseye is expanded, there is an increase in the number of darts thrown at the dartboard that will hit the bullseye.”<sup>189</sup> Thus, in patent litigation, a claim will be interpreted more narrowly than in a

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184. See Krystina L. Ho, Note, *America Invents—and So Can You? The Dichotomy of Subject-Matter Eligibility Challenges in Post-Grant Proceedings*, 115 COLUM. L. REV. 1521, 1534 (2015).

185. 35 U.S.C. §§ 316(e), 326(e) (2012); see *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144 (2016) (noting that preponderant evidence is required to establish unpatentability in IPR, but clear and convincing evidence is required to establish invalidity in litigation); Kammie Cuneo, *A Move Towards Globalization Provides a New Tool to Defend Against Infringement: The Rise of the IPR*, ADVOCATE, May 2016, at 25, 26.

186. See *SightSound Techs., LLC v. Apple Inc.*, 809 F.3d 1307, 1347 (Fed. Cir. 2015) (noting that the broadest reasonable interpretation standard is applied in CBM and other post-grant proceedings); 37 C.F.R. § 42.100(b) (2017) (stating that in IPR, a claim must be “given its broadest reasonable construction in light of the specification”). The Supreme Court held in *Cuozzo* that Congress authorized the USPTO to enact the provision requiring claims in post-grant proceedings to be given their broadest reasonable construction. *Cuozzo*, 136 S. Ct. at 2133.

187. See Ho, *supra* note 184, at 1534.

188. See *Rhine v. Casio, Inc.*, 183 F.3d 1342, 1345 (Fed. Cir. 1999) (discussing the origins of the principle that a claim should be construed to sustain its validity).

189. David Newman, *Technology Sectors at Risk from the Perfect Patent Storm*, LANDSLIDE, May–June 2016, at 48.

post-grant proceeding, and in litigation, courts state that claims should be interpreted to avoid invalidity.

Together, those two procedural differences weaken patents radically: It is easier to invalidate a claim construed broadly with preponderant evidence than it is to invalidate a claim construed narrowly with clear and convincing evidence. To return to the dart board metaphor, not only is the bullseye bigger, but fewer darts need to hit it to win.

The third procedural aspect of IPR that weakens patents is the fact that courts are authorized to stay patent litigation if the USPTO institutes an IPR, and the proof necessary to institute an IPR is even lower than what is needed to persuade the USPTO that a claim is unpatentable. The USPTO will institute an IPR if there is merely a reasonable likelihood that one claim is unpatentable under the broadest reasonable interpretation and preponderant evidence standard.<sup>190</sup> If that low hurdle is met, and the USPTO institutes an IPR, courts are authorized to stay pending patent litigation until the outcome of the IPR.<sup>191</sup> This means that if a patentee sues a defendant for infringing a patent, and that defendant is able to persuade the USPTO that it is reasonably likely there is preponderant evidence that a broadly interpreted claim is unpatentable, the litigation will likely be stayed pending the results from the USPTO.<sup>192</sup>

Thus, collectively, the procedures Congress created allow an accused infringer to avoid the presumption of validity and its requirement for clear and convincing evidence, avoid the rule that claims should be construed to sustain validity, avoid a narrow construction of a claim, and even avoid defending itself in court and the costs that entails. This is a substantial weakening of patent rights.

Other procedures have further weakened patents. First, Congress authorized the USPTO to continue an instituted IPR

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190. See *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1374–76 (Fed. Cir. 2016) (reasoning that, unlike routine prosecution, the burden never shifts to the patentee to establish non-obviousness because the burden is on the challenger in post-grant proceedings to establish the unpatentability of a claim); Revision of Standard for Granting an Inter Partes Reexamination Request, 76 Fed. Reg. 59055, 59056 (Sept. 23, 2011) (to be codified at 37 C.F.R. pt. 1).

191. See Lydigsen, *supra* note 181, at 15. Congress authorized district courts to stay a patent suit if a covered business method proceeding were instituted, and courts have held that the same discretion exists for the other new post-grant proceedings. See *id.*

192. See *id.*; *Motions to Stay District Court Cases Pending Post-Grant Proceedings*, DOCKETREPORT (Aug. 24, 2015, 4:52 PM), <http://docketreport.blogspot.com/2015/08/motions-to-stay-district-court-cases.html> [<https://perma.cc/ARE5-9EC7>].

proceeding even if the challenger settled with the patentee.<sup>193</sup> Further, Congress authorized the USPTO to intervene “in a later *judicial* proceeding to defend its decision—even if the private challenger[] drop[s] out.”<sup>194</sup> Finally, the USPTO has made it very difficult for a patentee to propose “substitute” claims to those originally issued.<sup>195</sup> So, for example, if a patentee believes that a claim in IPR is unpatentable, but a narrower claim would be patentable, it has been very difficult for the patentee to substitute the narrower claim and salvage some protection.

Perhaps a more subtle way that Congress weakened patents comes from the deference that the Federal Circuit appears to be giving to determinations by the USPTO compared to a jury or district judge. Once a claim is construed, the analysis of whether the claimed invention is new or would have been obvious is the same in a post-grant proceeding or in litigation. Yet, a recent study shows that the Federal Circuit in effect defers to the USPTO to a much greater extent than it defers to judges or juries.<sup>196</sup> Specifically, out of 133 decisions studied, the Federal Circuit reversed or remanded only twenty-five.<sup>197</sup>

Viewed against patent litigation, post-grant proceedings significantly diminish patent rights. The “leverage” that might exist by a pending, expensive patent suit crumbles to the advantage of the defendant, who can likely derail litigation in favor of a comparatively cheap post-grant proceeding in which procedure makes it much more likely that the effort to obtain coercive relief will end with the patent being found to have been wrongly issued in the first place.<sup>198</sup>

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193. See 35 U.S.C. § 317(a) (2012); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144 (2016).

194. *Cuozzo*, 136 S. Ct. at 2144 (emphasis in original).

195. See Jo Dale Carothers, *Are the Tides Turning for Motions to Amend Claims in IPR Proceedings?*, IP L. BLOG (Apr. 13, 2017), <http://www.theiplawblog.com/2017/04/articles/patent-law/are-the-tides-turning-for-motions-to-amend-claims-in-ipr-proceedings/> [<https://perma.cc/TE5R-RCC4>] (noting that the USPTO had “rarely” allowed claims to be modified during IPR proceedings).

196. See Rachel C. Hughey & Joseph W. Dubis, *Navigating Post-Grant Proceedings: What Two Years of Federal Circuit Decisions and the Supreme Court’s Cuozzo Decision Tell Us About Post-Grant Proceedings Before the PTAB*, FED. LAW., Jan.–Feb. 2017, at 70, 71–73.

197. *Id.* at 72.

198. See *id.* at 73. Again, the fact that Congress made it easier to challenge patents and to find them unpatentable does not mean this was a bad policy decision. See *id.*

## 2. Congress Enhanced Trade Secret Protection as an Alternative to Patenting

As explained above,<sup>199</sup> one cost of patenting that businesses consider is the fact that a patent applicant must disclose all information necessary to make or use the claimed invention. A primary alternative to patenting is trade secret protection, which obviously requires keeping information secret and not publishing it. If trade secrets are a more viable option, less patenting will occur.

Congress enhanced protection of trade secrets by adopting a federal statute to protect trade secrets, the Federal Defend Trade Secrets Act.<sup>200</sup> Trade secret protection is not always an alternative to patenting,<sup>201</sup> but to the extent that inventions can be protected under that regime, there is less incentive to patent.

### *C. States Made Patent Enforcement Riskier*

The riskier it is to assert a patent, the less incentive there is to apply for or acquire one to obtain coercive relief. States have enacted statutes that make it riskier to assert patent infringement. These have come in the form of “anti-troll” statutes. Each statute has its own particular requirements, but their general goal is to allow a person accused in bad faith of infringing a patent to obtain some form of redress against the patent owner. Vermont first adopted this form of statute in 2013,<sup>202</sup> after which thirty-one more states enacted statutes designed to limit the enforcement of patents.<sup>203</sup>

Although the statutes are designed to punish only bad faith enforcement efforts, given the fact that it has become more difficult to determine infringement and easier to establish invalidity, the disincentive created by these statutes is not so easily cabined. Whatever their impact, these laws increase the risk of asserting a patent to obtain coercive relief and so, to that extent, reduce the incentive to use patent protection.<sup>204</sup>

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199. See *supra*, notes 7–10 and accompanying text.

200. See Defend Trade Secrets Act of 2016, Pub. L. No. 114-153, 130 Stat. 376 (2016) (codified in scattered sections of 18 U.S.C.).

201. See Roger Allan Ford, *The Uneasy Case for Patent Federalism*, 2017 WIS. L. REV. 551, 565 (2017).

202. *Id.* at 554.

203. *Id.* at 555.

204. See *id.* at 558. And, again, making it riskier to assert a patent may represent a good policy choice. See Hughey & Dubis, *supra* note 196, at 73. That does not mean that they do not make patents riskier to assert. See Ford, *supra* note 201, at 558.

*D. The Judicial Conference of the United States Made Patent Enforcement Harder*

For fifty years, a patent complaint could not be dismissed for failing to state a claim upon which relief could be granted if it met the bare-bones requirement of Form 18, which appeared following the Federal Rules of Civil Procedure.<sup>205</sup> Patentees “routinely filed complaints that simply laid out jurisdiction and venue, identified a patent, claimed a sufficient ownership interest in the patent, and claimed that the defendant infringed the patent.”<sup>206</sup>

Effective December 2015, however, the Judicial Conference of the United States abolished Form 18 (and almost all other forms), so patent infringement must now be pled in accordance with case law generally applicable to civil litigation.<sup>207</sup> Some of the impact on enforcement is obvious: requiring greater detail means requiring greater presuit investigation and therefore more expense, which has resulted in multiple rounds of motions to dismiss, further driving up the costs to patentees.<sup>208</sup>

But the change also reduces the ability of patentees to assert infringement of some patents and conceivably could eliminate the ability to do so in some circumstances. For example, suppose the owner of a patent covering a method believes a competing business is practicing that method in its factory. A good faith basis to assert infringement has always been required, but without Form 18, the patentee must have additional detail to plead infringement. That increases costs, and in some marginal cases the pleading requirements may preclude a patentee from plausibly pleading infringement.

*E. The Supreme Court’s Weakening of Patents Is Amplified in Post-Grant Proceedings*

As shown above, the Supreme Court has weakened patents. Compared to today, in the year 2000, more inventions were eligible for

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205. See *Tannerite Sports, LLC v. Jerent Enters.*, No. 6:15-CV-00180-AA, 2016 WL 1737740, at \*10 (D. Or. May 2, 2016).

206. R. David Donoghue, *The Uneven Application of Twombly in Patent Cases: An Argument for Leveling the Playing Field*, 8 J. MARSHALL REV. INTELL. PROP. L. 1, 1 (2008).

207. See Jun Zheng, Note, *A New Era for Patent Infringement Pleading: Twombly, Iqbal, and the Demise of Form 18*, 24 TEX. INTELL. PROP. L.J. 15, 30–31 (2016).

208. See, e.g., *Wright’s Well Control Servs., LLC v. Oceaneering Int’l, Inc.*, No. 15-1720, 2017 WL 568781, at \*3 (E.D. La. Feb. 13, 2017); see also Michelle Callaghan, *Patent Infringement Pleading Standards Since the Abrogation of Rule 84 and Form 18: A Year in Review*, IP WATCHDOG (Dec. 27, 2016), <http://www.ipwatchdog.com/2016/12/27/patent-infringement-pleading-standards-rule-84-form-18/id=76173/>.

patenting, more inventions were non-obvious, more claims were definite, “equivalents” more likely infringed, infringement included more overseas conduct, patent rights were less easily exhausted, patentees could subject defendants to suits in districts more favorable to them, a losing patentee would almost never pay attorneys’ fees, and an injunction was the general rule that benefited a successful patent infringement plaintiff.<sup>209</sup> This no doubt explains why Judge Dyk—who, as a long-serving Federal Circuit judge, had a front row seat to observe the impact of these cases—characterized the Supreme Court’s decisions as having “had a major impact on patent law.”<sup>210</sup>

The critical and somewhat overlooked point is that the weakening of patents by the Supreme Court’s decisions was amplified by expanded post-grant proceedings and the availability for them to proceed in lieu of adjudication. Taken together, a claim will not only be given a broader interpretation and be unpatentable with merely preponderant evidence, a patent issued under the Federal Circuit’s “teaching or suggest” approach to obviousness will also be judged by the more stringent standards of the Supreme Court from *KSR*. Patents issued before the restriction on subject matter eligibility likewise will be judged anew under the narrower standards from the Supreme Court.

There is no doubt that changes in the law have radically curtailed the coercive power of patents. Businesses should be seeking, purchasing, and asserting fewer patents. The next Part of this Article analyzes whether there is evidence that this has happened.

### III. THE EVIDENCE THAT WEAKENED PATENT LAW HAS REDUCED THE INCENTIVES TO PATENT

In 2016, Professor Mark Lemley considered many of the forces working against strong patent protection discussed above, examined the available evidence, and concluded that the patent system was

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209. See *Sandoz Inc. v. Amgen Inc.*, 137 S. Ct. 1664, 1677–78 (2017) (reversing the Federal Circuit and holding that courts could not enjoin a violation of a statutory requirement imposed on applicants seeking FDA approval of a drug that, by operation of statute, infringed a patent).

210. Timothy B. Dyk, *Thoughts on the Relationship Between the Supreme Court and the Federal Circuit*, 16 CHI-KENT J. INTELL. PROP. 67, 72 (2016). In contrast, one commentator characterized these Supreme Court cases as not involving “foundational” patent issues and argued that the Court did not make “meaningful changes.” Gugliuzza, *supra* note 30, at 338, 343. The article states that the Court’s decisions have “often been trivial in content,” whether they involved validity, infringement, or remedies—with “a few exceptions.” *Id.* at 349.

“surprisingly resilient.”<sup>211</sup> In rebuttal, Tun-Jen Chiang called Lemley’s conclusion “premature.”<sup>212</sup>

Indeed, the argument that the patent system is doing fine is supported by the fact that despite the Supreme Court’s efforts and the expansion of post-grant proceedings, the number of patent applications and patent suits both continued their long trend upward.<sup>213</sup> But at a time of rapid innovation, an increase is to be expected. Further, it may take time for decision makers to appreciate the impact of these changes and assimilate them into the decision of whether to apply for a patent.

In all events, the pertinent question is not whether the number of patent applications and suits filed are still increasing, but instead whether they would have increased even more had patent rights not been weakened. The following describes the anecdotal evidence, which suggests that but for the weakened patent laws, a higher level of patent activity would be occurring.

First, 2015 marked the first year since 2008—the year of the “Great Recession”—that the number of patents granted by the USPTO declined.<sup>214</sup> Likewise, patent litigation declined by 2 percent, compared to a typical compound annual growth rate of more than 6 percent per year in prior years.<sup>215</sup> The same businesses that presumably saw the cost-benefit analysis favoring patent protection may be seeing a different bottom line today. Analyzing that trend, a leading consulting firm wondered if the US patent system is at an “inflection point.”<sup>216</sup>

Second, and related to that point, more patent applications are now filed in China than in the United States.<sup>217</sup> Increased Chinese innovation and legal protection for patents partly explain that shift. But, even if viewed as anecdotal, China’s newly found patent application prominence is consistent with the decreased incentive to patents under US law. Something has made patents less desirable in the United States, but not in China.

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211. Lemley, *supra* note 15, at 2.

212. Tun-Jen Chiang, *Some Realism About the Resiliency of the Patent System*, 95 TEX. L. REV. 106, 106-07 (2016).

213. Lemley, *supra* note 15, at 1–2, 18 fig.6, 19 fig.7.

214. CHRIS BARRY ET AL., PRICEWATERHOUSE COOPERS, 2016 PATENT LITIGATION STUDY: ARE WE AT AN INFLECTION POINT? 1 (2016), <https://www.pwc.com/us/en/forensic-services/publications/assets/2016-pwc-patent-litigation-study.pdf> [<https://perma.cc/L36Z-6LQU>].

215. *Id.*

216. *Id.*

217. WORLD INTELLECTUAL PROP. ORG., WORLD INTELLECTUAL PROPERTY INDICATORS 2016, at 21 (2016), [http://www.wipo.int/edocs/pubdocs/en/wipo\\_pub\\_941\\_2016.pdf](http://www.wipo.int/edocs/pubdocs/en/wipo_pub_941_2016.pdf) [<https://perma.cc/KFS6-9W6L>].

Third, the secondary market for patents is in decline—and an abrupt one. In a 2016 article, Professor Lemley relied upon a 2015 report to conclude there was no “obvious relationship between patent strength and the robustness of patent markets,” noting that anecdotal evidence showed the market was “expanding” and was at record levels.<sup>218</sup> Yet the 2016 update of that same report showed the market had fallen by one-third (to \$165 million from \$233 million) and that sales rates had declined.<sup>219</sup>

As further anecdotal evidence, in early 2017 one of the largest portfolio patent assertion entities—Intellectual Ventures—stopped acquiring patents on the secondary market.<sup>220</sup> One article attributed that move directly to changes in the legal landscape, stating that “successive changes to the legal and regulatory climate in the US” had “devalued” patents.<sup>221</sup> Thus, a major business that had existed solely to profit from the coercive power of patents determined that the cost-benefit calculation had shifted.

These data points are simply that. They may signal no long-term trend. But only anecdotes are available now, since it is far too soon to quantify with certainty the extent to which these changes impact the cost-benefit analysis of patenting. The benefit of patenting, however, has been reduced.

This brings this Article to the second force that is and will continue to reduce the coercive power of patenting: in a growing number of industries, innovation itself is likely to reduce the ability of a patent owner to obtain coercive relief.

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218. Lemley, *supra* note 15, at 23 (citing KENT RICHARDSON, ROL GROUP, 2015 BROKERED PATENT MARKET (2015), <https://www.richardsonoliver.com/2015/11/19/2015-brokered-patent-market/> [<https://perma.cc/ZZM6-NHMN>]).

219. RICHARDSON, *supra* note 52, at 2.

220. Richard Lloyd, *IV Pulls Back from Patent Acquisition Market to Focus on Monetising Existing Portfolio Through Sale and Licence*, IAM: BLOG (Apr. 4, 2017), <http://www.iam-media.com/Blog/Detail.aspx?g=920464d2-9022-4b28-8bbd-f5e835bbf3b1> [<https://perma.cc/D2HD-NYEH>]. Intellectual Ventures had in 2016 become more selective in acquisitions. See Malathi Nayak, *Intellectual Ventures Back in Brokered Patent Market for Q4*, BLOOMBERG BNA (Mar. 10, 2017), <https://www.bna.com/intellectual-ventures-back-n57982085043/> [<https://perma.cc/3CBG-6M8Y>].

221. Richard Lloyd, *The Market Reacts to IV's Decision to End Its Patent Acquisitions Programme—The Right Decision at the Right Time*, IAM: BLOG (Apr. 6, 2017) <http://www.iam-media.com/blog/Detail.aspx?g=b967559f-5f6d-4001-90b1-bd193beff2fd> [<https://perma.cc/DVF2-PUN2>].

IV. THE IMPACT OF THE SECOND FORCE: THERE WILL BE MORE AND FASTER INNOVATION, BUT THE SPEED AT WHICH INNOVATION OCCURS ALSO WILL REDUCE THE COERCIVE POWER OF PATENTS

Understanding the potential effect of the quickening pace of innovation on the coercive power of patents requires an understanding of commercial products and some basics about patent drafting strategies. Accordingly, before turning to the potential effect of rapid innovation, this Part summarizes some basic principles about both product development and patent drafting.

It takes time to develop a new product (time-to-market), and then once developed, a product has a life cycle (product life cycle).<sup>222</sup> Product life cycles are generally correlated with time-to-market: the longer it takes to get a particular type of product to market, the longer its life cycle.<sup>223</sup> This is because the more time it takes to develop a product, the longer it will take for a “better” product to be developed and take its place. Likewise, there is a correlation with product life cycles and how long it takes for competitors to imitate the new product.<sup>224</sup> However, “[i]mitation is usually faster and less expensive than innovation” because competitors can “avoid most—and sometimes all—of the higher R&D [research and development] costs.”<sup>225</sup> Taking these things together, products with short life cycles can generally be rapidly imitated, but they are also comparatively quickly gone from the market.<sup>226</sup>

A practitioner drafting a patent application for a new product ordinarily will draft the patent application to support claims that cover not only copycat versions of the patentee’s commercial product, but also foreseeable variations and improvements on it.<sup>227</sup> Accordingly, a patent will likely initially cover, or be able to cover, not only a competitor’s exact copy of the initial commercial product, but also the next generation (or more) of improvements on the initial product.<sup>228</sup> Eventually, of course, the replacement products become so differentiated from the initial invention that the patent no longer covers them.

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222. See Christopher S. Yoo, *Product Life Cycle Theory and the Maturation of the Internet*, 104 NW. U. L. REV. 641, 643–47 (2010) (giving a general description of the steps in a typical product life cycle).

223. See Benjamin N. Roin, *The Case for Tailoring Patent Awards Based on Time-to-Market*, 61 UCLA L. REV. 672, 735–36 (2014).

224. See *id.* at 731.

225. *Id.*

226. See *id.* at 685.

227. See *id.* at 695.

228. See *id.*

Data storage provides an illustration.<sup>229</sup> This technology has rapidly morphed in just twenty years to encompass various forms of storage and different variations within each type, including devices using magnetism (zip drives), light (CDs, then DVDs), and other means (thumb drives and other forms of solid state devices). Holographic storage—whatever that means—is apparently coming next.<sup>230</sup> A patent filed twenty years ago covering magnetic storage devices may have been likely to cover later improvements on magnetic storage, but is highly unlikely to support a claim covering a device using holographic storage.

This Part turns to the fact that time-to-market is decreasing because of technology. That means, of course, that product life cycles will decrease, as will the time it takes for competitors to market competing or improved products. The ongoing exponential increase in computing power, bandwidth, and storage is decreasing the time-to-market for a greater number of new products. That fact, almost by definition, should mean more patentable inventions. However, the same forces that allow for rapid innovation mean that patents will be useful to protect fewer products: if a patent issues only after the product life cycle ends, there is no reason to obtain a patent. Likewise, the same forces that allow for rapid innovation also make it easier and quicker for competitors to bring to market both copycat infringing products and improved versions of the innovator's product. An already-existing example of this phenomenon is 3D printing. It makes copying products faster and cheaper, disperses infringement among consumers, and therefore makes infringement harder to detect than a single-source competitor's sales of infringing products. This Part examines these forces and their potential impact on the coercive benefit of patenting.

*A. By Reducing Time-to-Market, Technology Is  
Decreasing Product Life Cycles for a Greater Number of Products*

The amount of time it takes to bring a product to market varies among industries and even within a single one.<sup>231</sup> A recent analysis suggests that the average time-to-market for financial products is a few weeks, between three and thirteen months for consumer products, eleven to twenty-six months for semiconductors, and sometimes years

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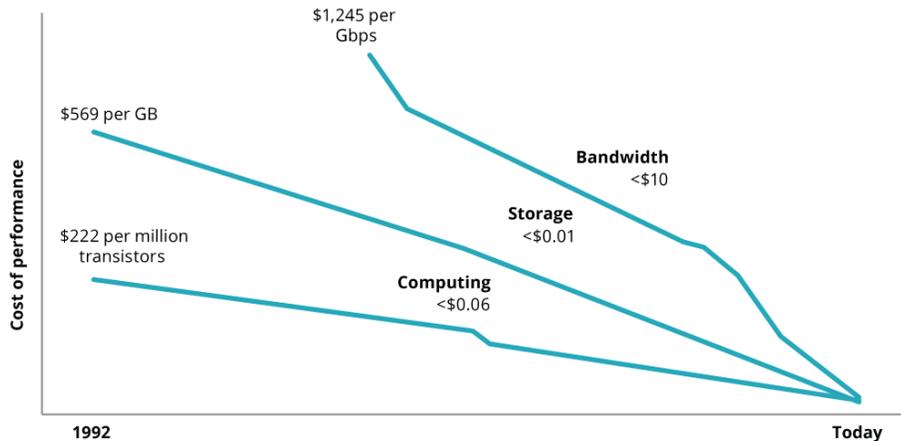
229. See *History of Data Storage Technology*, ZETTA: ZETTA BLOG (May 5, 2016), <http://www.zetta.net/about/blog/history-data-storage-technology> [<https://perma.cc/8HYV-R6A4>].

230. See Roin, *supra* note 223 at 717–18.

231. *Id.*

or even decades for other products.<sup>232</sup> Studies show that time-to-market largely depends on the complexity of research and development, and more than 50 percent of costs in a typical project consist of the salaries of scientists and engineers.<sup>233</sup>

Technology will shorten time-to-market for a growing number of products.<sup>234</sup> The speed of innovation has increased dramatically in large part because computing power has increased exponentially in accordance with Moore's Law. Moore's Law is the recognition made in 1965 that the number of transistors that could fit on a chip—an integrated circuit—would double every two years.<sup>235</sup> It explains why the cost of computing power, the cost of bandwidth, and the cost of data storage have plummeted, meaning that the speed of innovation has increased. This chart<sup>236</sup> from late 2016 captures the impact of Moore's Law:



To better contextualize the meaning of this exponential decrease in cost of computing, consider this analogy:

232. *Id.* at 719 tbl.1.

233. *Id.* at 730.

234. *See id.* at 732–33; *see also* Rajshree Agarwal & Michael Gort, *First-Mover Advantage and the Speed of Competitive Entry, 1887–1986*, 44 J.L. & ECON. 161, 174 (2001) (concluding that rapid diffusion of technical information is a factor that is decreasing time-to-market).

235. Annie Sneed, *Moore's Law Keeps Going, Defying Expectations*, SCI. AM. (May 19, 2015), <https://www.scientificamerican.com/article/moore-s-law-keeps-going-defying-expectations/> [<https://perma.cc/YG4V-PYL2>].

236. ADAM MUSSEOMELI, DOUG GISH & STEPHEN LAAPER, DELOITTE, *THE RISE OF THE DIGITAL SUPPLY NETWORK* 3 fig.1 (Deloitte Univ. Press 2016), [https://dupress.deloitte.com/content/dam/dup-us-en/articles/3465\\_Digital-supply-network/DUP\\_Digital-supply-network.pdf](https://dupress.deloitte.com/content/dam/dup-us-en/articles/3465_Digital-supply-network/DUP_Digital-supply-network.pdf) [<https://perma.cc/TJY2-LDR6>].

Another way to think about Moore's law is to apply it to a car. Intel CEO Brian Krzanich explained that if a 1971 Volkswagen Beetle had advanced at the pace of Moore's law over the past 34 years, today "you would be able to go with that car 300,000 miles per hour. You would get two million miles per gallon of gas, and all that for the mere cost of four cents."<sup>237</sup>

Computer power enabled by Moore's Law is reducing time-to-market for a growing number of new products by reducing the amount of work humans are required to do, thus allowing products to be brought to market more quickly and more cheaply.<sup>238</sup> Further, computer power, bandwidth, and storage allow more products to contain embedded sensors that automatically and immediately provide testing data, thus allowing for quicker identification of needed changes.<sup>239</sup> Not only will such sensors allow for testing to be shortened and more efficient, these technologies allow businesses to identify services or products the consumer does not even know she needs—the ride sharing service Uber's replacement of cabs illustrates this phenomenon.<sup>240</sup> Indeed, products that embody the innovation described by Moore's Law are themselves examples of what Moore's Law is permitting: no one knew they needed an iPhone until they saw one. The reduction of the time and cost needed for research and development, a significant part of time-to-market, will be profound.

As a result of technology, a growing number of products will be brought more quickly to market, will be more rapidly copied, and will have shorter life cycles.<sup>241</sup> This is particularly true in digital industries, a growing part of the economy, where "barriers to creating entirely new products tend to be lower, and innovations—perhaps as a result of this—appear to be more frequent."<sup>242</sup> However, some new products face barriers to entry that technology will not impact as quickly. Pharmaceuticals are a prime example:

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237. Sneed, *supra* note 235.

238. See COMM. ON FORECASTING FUTURE DISRUPTIVE TECHS., NAT'L RESEARCH COUNCIL, PERSISTENT FORECASTING OF DISRUPTIVE TECHNOLOGIES 34 (2010) (noting that globalization has led to a shrinking research and development cycle, faster product development in response to consumer demand, a shorter product development cycle, and a shorter product cycle).

239. See, e.g., Peter M. Lefkowitz, *Making Sense of the Internet of Things*, 59 BOS. B.J. 23, 23–24 (2015) (describing the vast array of sensors that will provide feedback to consumers, manufacturers, and others about product performance and needs).

240. See *id.* at 24.

241. See Yu Sang Chang, Jinsoo Lee & Yun Seok Jung, *Are Technology Improvement Rates of Knowledge Industries Following Moore's Law? An Empirical Study of Microprocessor, Mobile Cellular, and Genome Sequencing Technologies* 13–14 (KDI Sch. Pub. Policy & Mgmt. Working Paper No. 12-04, 2012), [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2017413](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2017413) [<https://perma.cc/DYU6-PLB5>].

242. Newman, *supra* note 18, at 687.

Clinical testing comprises three phases of human trials designed to test whether a drug is safe and effective for general public consumption. After successful completion of all three phases of clinical trials—a process which can take several years—only then can a drug company submit a New Drug Application (NDA), a formal request to the FDA seeking approval of the drug to be marketed in the United States. After an NDA is received, the FDA has sixty days to determine whether to file the application for comprehensive review. All in all, the entire drug approval process can take over a decade to complete and cost pharmaceutical companies approximately \$1.2 billion per drug.<sup>243</sup>

Technology will speed up the time it takes, and lower the cost, to research and develop a new drug, but plainly not to the same degree as in digital industries. Likewise, barriers exist to marketing other new products. For example, once it became possible to use 3D printers to print parts for aircraft, regulations were immediately put in place that will slow their adoption. There are calls for greater regulation of 3D-printed products intended for various purposes.<sup>244</sup>

To sum up, technology will speed up some aspects of bringing many new products to market. However, its impact will not be uniform among industries or, more likely, even among products within industries.

*B. The Same Technologies That Shorten Time-to-Market for Innovators Allow Competitors to Quickly and More Cheaply Market Competing Products*

Just as it takes time for innovators to bring new products to market, competitors need time to develop and market competing products. However, as noted above, the amount of time is shorter and the development costs are lower. Competitors have always been able to free ride to some extent on the research and development of innovators, having to “replicate much of [an] innovator’s development-phase investments,”<sup>245</sup> but the same innovations that allow for quicker innovation allow for cheaper copying—computer-aided design, three dimensional imaging tools, and more.<sup>246</sup>

For some competitors, their ride may quite literally be free. Using 3D printers, the research and development time and costs can

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243. Caitlyn Martin, *Questioning the “Right” in State Right to Try Laws: Assessing the Legality and Effectiveness of These Laws*, 77 OHIO ST. L.J. 159, 168 (2016) (footnotes omitted).

244. See, e.g., Shlomit Yanisky-Ravid & Kenneth S. Kwan, *3D Printing the Road Ahead: The Digitization of Products When Public Safety Meets Intellectual Property Rights—A New Model*, 38 CARDOZO L. REV. 921, 925 (2017).

245. Roin, *supra* note 223, at 731–32 (citing Edwin Mansfield et al., *Imitation Costs and Patents: An Empirical Study*, 91 ECON. J. 907, 913 (1981); Pamela Samuelson & Suzanne Scotchmer, *The Law and Economics of Reverse Engineering*, 111 YALE L.J. 1575, 1588 (2002)).

246. *Id.* at 732–33.

approach zero. 3D printers are already available at local hardware stores and are capable of printing things made of plastic and other materials, with metal and even biological 3D printers arriving to the market soon.<sup>247</sup> Indeed, the Food and Drug Administration (FDA) has already issued draft guidance concerning 3D-printed medical devices.<sup>248</sup> Again, not all technologies will see the same degree of increase, but the ability to copy innovation even in fields such as biotechnology is advancing rapidly.<sup>249</sup> Everything will come and go more quickly in the future.

*C. What Shorter Time-to-Market, Shorter Product Life Cycles, and Faster Infringement Mean for Patenting*

The beginning point to understanding the impact of innovation on patent utility as a coercive tool is that patents presumably will continue to take about twenty-four months to obtain even though an ever-increasing number of products will come to market more quickly, be copied more quickly, and demand for them will more rapidly subside.

Thus, as an extreme example of the impact of innovation on the coercive benefit of patents, for an increasing number of products, that benefit will not exist. More products will have life cycles shorter than twenty-four months. There will be no damages to obtain, no competitors to enjoin, and no reason to obtain a patent.<sup>250</sup> On the

247. See, e.g., *3D Printer Materials Guide*, 3D PRINTING.COM, <https://3dprinting.com/materials/> [<https://perma.cc/4EVE-NG58>] (last visited Sept. 19, 2017); Amanda Froelich, *New Metal 3D Printer Is 100x Faster, 10x Cheaper Than Existing Laser Technologies*, INHABITAT (Aug. 1, 2017), <http://inhabitat.com/new-metal-3d-printer-is-100x-faster-10x-cheaper-than-existing-laser-technologies/> [<https://perma.cc/9GFW-J3ZS>]; Maitreya Patwardhan, *3D Printing of Biomaterials: Analyzing the Revolution in Healthcare*, 3D PRINTING.COM (Oct. 9, 2015), <https://3dprinting.com/bio-printing/3d-printing-of-biomaterials-analyzing-the-revolution-in-healthcare/> [<https://perma.cc/N2ZR-9XSU>].

248. See CTR. FOR BIOLOGICS EVALUATION AND RESEARCH & CTR. FOR DEVICES AND RADIOLOGICAL HEALTH, U.S. DEP'T OF HEALTH & HUMAN SERVS., TECHNICAL CONSIDERATIONS FOR ADDITIVE MANUFACTURED DEVICES: DRAFT GUIDANCE FOR INDUSTRY AND FOOD AND DRUG ADMINISTRATION STAFF (2016); see also Anna B. Laakmann, *Customized Medicine and the Limits of Federal Regulatory Power*, 19 VAND. J. ENT. & TECH. L. 285, 320–21 (2016) (discussing the FDA's draft guidance and noting the questions it leaves unanswered).

249. Roin, *supra* note 223, at 733.

250. As explained *supra* notes 155–60 and accompanying text, the Supreme Court in *eBay* rejected the Federal Circuit's general rule that an injunction will generally issue upon a finding of infringement. *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 393–94 (2006). The shortening of product life cycles diminishes the meaningfulness of potential injunctive relief even further because courts ordinarily enjoin patent infringement only after judgment, and patent litigation takes many months to complete. If a suit is filed, and if an IPR occurs, and if the patent survives, litigation will not even begin in earnest until the one-year IPR proceeding ends. Even then, litigation will take more time in the future than it has in the past because *TC Heartland*

other end of the spectrum, in some industries other barriers to entry will mitigate competitors' otherwise-increased ability to market competing products, and so the impact of this change will be minimal, or at least attenuated.

In between those two extremes lies the fact that more products will have shorter life cycles. For an indication of how many products will have life cycles approaching twenty-four months, a 2010 study showed that 25 percent of patent attorneys reported that their clients' products were off the market in less than three to four years.<sup>251</sup> In the cost-benefit analysis of determining whether to apply for a patent, the coercive benefit has no value unless the life cycle of the product exceeds the time it takes to obtain a patent.<sup>252</sup> For a greater number of products, a patent may give no coercive benefit.

To be clear, even if demand for the innovator's original product has come and gone, there may be some coercive benefit to patenting. As noted above, to the extent practicable, patent lawyers draft patent applications to support claims that cover not only the commercial embodiment of the patentee's product but also anticipated improvements and alternatives to it.<sup>253</sup> Thus, a patent could impede competitors from selling products that were, when the patent application was filed, foreseeable alternatives to the innovator's product, for example.<sup>254</sup>

While the degree to which product life cycles will fall within the time it takes to obtain patent protection will vary among industries—some new products take years to market, others weeks—the trend is toward decreasing time-to-market, so shorter product life span is likely going to be a constant across them all. The coercive benefit represented by a patent will have less value for more products in a faster evolving world.

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eliminated patentees' ability to choose jurisdictions with quick time-to-trial. See *TC Heartland LLC v. Kraft Foods Group Brands LLC*, 137 S. Ct. 1514, 1517 (2017); Holte & Seaman, *supra* note 151, at 199. Therefore, the benefit of injunctive relief will not exist for products with life cycles lasting well beyond twenty-four months.

251. Roin, *supra* note 223, at 735 (citing IAIN M. COCKBURN & REBECCA HENDERSON, SURVEY RESULTS FROM THE 2003 INTELLECTUAL PROPERTY OWNERS ASSOCIATION: SURVEY ON STRATEGIC MANAGEMENT OF INTELLECTUAL PROPERTY C.8 (2003); LONDON ECON., ECONOMIC STUDY ON PATENT BACKLOGS AND A SYSTEM OF MUTUAL RECOGNITION 57 (2010)).

252. This Article analyzes solely the benefits of the coercive aspect of patent rights. But others have observed that products with short life cycles must have early patent protection to make investment and patenting worthwhile. See J. Michael Martinez de Andino & Gregory M. Murphy, *US Patent Office Delays Creating Limited and Late Protection*, 19 NO. 11 INTELL. PROP. & TECH. L.J. 17 (2007).

253. See Roin, *supra* note 223, at 695.

254. See *id.* at 678.

*D. 3D Printing Further Reduces the Coercive Benefit of Patenting by Making Infringement Easier, Dispersed, and More Difficult to Detect*

The impact of 3D printing on copying is noted above, but another way that 3D printers make patent protection less desirable is that, to the extent that a patented product can be economically printed by an individual consumer, no mass-market manufacturer exists that can readily be sued. Infringement will accordingly be dispersed. Filing a patent suit against every individual who printed a single patented product will presumably turn out no more viable an enforcement mechanism for patent owners than it was for copyright owners who sued those who downloaded a song or two.

Detecting this infringement will also be difficult. While a computer-aided design (CAD) file is needed to print a particular product, those files can be shared secretly—much like digital music files. Further, a number of file-sharing sites already exist,<sup>255</sup> and policing them will, no doubt, turn out to be as difficult for parts makers as it was for melody makers.

The fact that individuals will be able to make certain products without detection, or even if detected, without a viable means of being prevented from future infringement plainly cuts against patenting. That said, 3D printers cannot print everything that is patentable. Again, the direction is clear, while the degree of impact on the incentive to patent is not.

*E. Innovation Will Increase, and So Will the Number of Patentable Inventions*

As explained above, the speed of innovation means that generally it will be possible to bring new products to market much more rapidly in the future. This same power also means that more innovation will occur, which presumably means that more patentable inventions will be created in a shorter period of time. Indeed, 3D printing has itself led to patents.<sup>256</sup>

How much innovation is occurring and is about to occur? The most famous point on this subject comes from Al Bartlett: “The greatest shortcoming of the human race is our inability to understand

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255. See *8 of the Best CAD Sites Online*, 3Dconnexion: 3DXBLOG (May 13, 2015, 9:00 AM), <http://blog.3dconnexion.com/8-best-cad-sites> [<https://perma.cc/UDZ5-C6VH>] (describing the “best” eight CAD sharing sites).

256. Steven J. Schwarz et al., *Additive Manufacturing, Increasing Intellectual Property*, 24 NO. 9 WESTLAW J. INTELL. PROP. 1, 1 (2017).

the exponential function.”<sup>257</sup> That quote perhaps explains why a 2014 headline from Wired Magazine states: “The Internet of Things is Far Bigger than Anyone Realizes.”<sup>258</sup>

Today’s patentee exists in a period where innovation is occurring at an unprecedented and bewildering rate. No doubt innovation is occurring at a greater pace than ever before in human history. That fact suggests that even if patents are less desirable and so are sought less often, patents nonetheless will be sought in greater numbers simply because more inventions will be made.

Further still, the same things that allow for rapid innovation are being used to make patents more valuable. For example, one new business is designed to use the same technology that is speeding up the potential demise of patents to increase the number of commercialized patents.<sup>259</sup> This new business attempts to use the power of computing to match inventors with businesses by mining patent data as a sort of “match-making service.”<sup>260</sup>

How will these competing near-term realities combine?

## V. LOOKING AHEAD

### A. *A Fool’s Game: Predicting Even the Near-Term Future of Patents*

There are some axiomatic things to observe. The fact that innovation today can occur more quickly means that the number of inventions will also increase rapidly. And as a simple proposition, the number of patent applications will increase so long as the pace of increase in patentable inventions exceeds the growing number of products for which patent protection is not available.

Predicting the future is also difficult because other factors affect the desire for patenting: business concerns, antitrust issues, and industry-specific cultural views of patents. It is clear that the desirability of patenting within a single industry changes over time and is not wholly dependent on the strength of patent law. A well-known and especially pertinent example involves

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257. Al Bartlett, *Arithmetic, Population and Energy—A Talk by Al Bartlett*, AL BARTLETT, [http://www.albartlett.org/presentations/arithmetic\\_population\\_energy.html](http://www.albartlett.org/presentations/arithmetic_population_energy.html) [<https://perma.cc/GS5E-25M7>] (last visited Sept. 20, 2017).

258. Daniel Burrus, *The Internet of Things Is Far Bigger than Anyone Realizes*, WIRED, <https://www.wired.com/insights/2014/11/the-internet-of-things-bigger/> [<https://perma.cc/WE8E-W3VC>] (last visited Sept. 20, 2017).

259. See Robert Litan, *Big Data Is Key to Disrupting the U.S. Patent Industry*, FORTUNE (April 22, 2015), <http://www.fortune.com/2015/04/22/big-data-patent-system/> [<https://perma.cc/D282-EUQY>].

260. *Id.*

semiconductors. In just the recent past, the semiconductor industry has gone from abjuring patents, to racing to obtain them, to obtaining them but cross-licensing, and various mixtures along the way.<sup>261</sup> These fluctuations occurred even after the Federal Circuit began its steady march toward stronger patent protection.<sup>262</sup> If past is prologue, the semiconductor industry's past reveals that, in just the near future, businesses will neither move toward nor away from patenting in a straight line.

The semiconductor industry's fluctuating views toward patents is especially important in examining the future view of patents because integrated circuits are at the heart of future changes. Integrated circuits will soon be in everything and used to connect everything to the Internet in the form of the "Internet of Things." The semiconductor industry's unpredictable changes in patent practices, occurring at a time when patent law was steadily moving to favor patents, suggest that many factors influence the desirability of patenting beyond the legal landscape.

### *B. Immediate Considerations for Innovators and Patent Practitioners*

Despite future uncertainties, there are immediate short-term considerations for lawyers and clients to consider in evaluating whether to patent that are far more concrete and discernable than the broader issues outlined above. This Section catalogs these considerations.

#### 1. Trade Secrets as an Alternative to Patenting

To obtain a patent, an applicant must disclose the information necessary to make and use the invention. Understandably, the unwillingness to do so when the information is a trade secret is one reason businesses forego patenting.<sup>263</sup> Given the weakened protection afforded to patents, depending on the industry and the particular invention, the cost-benefit analysis may in more instances favor trade secrets.

In that regard and as noted above, by enacting the Federal Defend Trade Secrets Act,<sup>264</sup> Congress, for the first time, provided

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261. See Thomas Hoeren, Francesca Guadagno & Sacha Wunsch-Vincent, *Breakthrough Technologies—Semiconductor, Innovation and Intellectual Property* 22–23 (World Intellectual Prop. Org., Econ. Research Working Paper No. 27, 2015), [http://www.wipo.int/edocs/pubdocs/en/wipo\\_pub\\_econstat\\_wp\\_27.pdf](http://www.wipo.int/edocs/pubdocs/en/wipo_pub_econstat_wp_27.pdf) [<http://perma.cc/PL7F-ETTJ>].

262. See *id.* at 32.

263. Sichelman & Graham, *supra* note 16, at 173.

264. 18 U.S.C. § 1836 (2012).

federal trade secret protection.<sup>265</sup> Practitioners should consider this option in light of likely near-term changes in the particular industry and in light of the invention.

## 2. Quicker and More Effective Patent Prosecution Tactics, and Related Issues

When patenting is the best choice for a particular invention, there are steps that practitioners can take to get more benefit from a patent. They can speed up prosecution, allow for damages before issuance, and draft claims in a way to address 3D printing. In a particular case, none of these steps may be best for a client, or some combination may be appropriate. Some of these steps are outlined below.<sup>266</sup>

### *a. Use Track One or Other Existing Procedures to Reduce the Twenty-Four-Month Delay*

The USPTO has adopted procedures that, while more expensive than traditional prosecution, rapidly speed up the time to issuance from the typical twenty-four months.<sup>267</sup> There are four potential means to reduce the time to issuance: (1) Track One Prioritized Examination, (2) the Patent Prosecution Highway, (3) the First Action Interview Pilot Program, and (4) Accelerated Examination.<sup>268</sup> Each of these procedures has its own requirements,<sup>269</sup> but they each potentially significantly reduce the twenty-four-month delay.

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265. See Richard F. Dole, Jr., *Identifying the Trade Secrets at Issue in Litigation Under the Uniform Trade Secrets Act and the Federal Defend Trade Secrets Act*, 33 SANTA CLARA HIGH TECH. L.J. 470, 500 (2017).

266. Practitioners for clients in certain fields have already faced shorter product life cycles and have adopted practices such as using requests for continued examination, rather than traditional continuation practice, to speed up prosecution. See Mark A. Lemley & Bhaven Sampat, *Examining Patent Examination*, 2010 STAN. TECH. L. REV. 2, 28 tbl.13 (2010) (showing that computer and software practitioners are much more likely to use RCE, rather than continuations). See generally Mabey, *supra* note 40 (discussing backlog generally).

267. To be clear, during regular prosecution, there are ways to speed up examination, such as by appropriately asking for an examiner interview. See Lisa Adams & Derek Constantine, *Why You Should Use the USPTO's Automated Interview Request (AIR) Form*, MINTZ LEVIN: GLOBAL IP MATTERS (Mar. 30, 2017), <https://www.globalipmatters.com/2017/03/30/why-you-should-use-the-usptos-automated-interview-request-air-form> [https://perma.cc/TS36-UMMQ]. The focus here is on ways outside of regular prosecution to reduce delay. See Rory P. Pheiffer & Lauren Ingegneri, *Paths to Get a Patent Approved More Quickly*, 27 NO. 3 INTELL. PROP. & TECH. L.J. 16, 16 (2015).

268. Pheiffer & Ingegneri, *supra* note 267, at 16.

269. See *id.* at 16–17.

Foremost, the average time for the USPTO to grant a petition to allow a patent application to enter Track One is about six weeks. The time from that point to allowance is just over five months, and so the average pendency is about six-and-a-half months.<sup>270</sup> While it is more expensive and limited in other ways, Track One is a mechanism that may be needed to obtain meaningful patent protection more frequently in the near future.

*b. Use Existing Procedures to Allow for Recovery of Damages Upon Publication of the Patent Application, Not Only After Issuance of the Patent*

While ordinarily damages for patent infringement are available only after issuance, Section 154(d) of the Patent Act permits damages for “infringement” occurring before issuance, but only in narrow circumstances. The statute provides:

[A] patent shall include the right to obtain a reasonable royalty from any person who, during the period beginning on the date of publication of the application . . . and ending on the date the patent is issued—(A)(i) makes, uses, offers for sale, or sells in the United States the invention as claimed in the published patent application or imports such an invention into the United States . . . and (B) had actual notice of the published patent application.<sup>271</sup>

Thus, the three essential requirements for a successful damages claim are that the defendant (1) on or after the date the application is published; (2) infringes “the invention as claimed” in the published application; and (3) had actual notice of the published application.<sup>272</sup> In some circumstances, therefore, a patent practitioner should consider providing a copy of an application to anyone known to be “infringing” a claim in the application.<sup>273</sup>

Generally, the USPTO publishes a patent application eighteen months after it was filed.<sup>274</sup> Given the average pendency of twenty-four months,<sup>275</sup> this could provide six additional months of damages. Given that more products will have shorter product life

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270. *Data Visualization Center: September 2017 Patents Data, at a Glance*, USPTO, <https://www.uspto.gov/corda/dashboards/patents/main.dashxml?CTNAVID=1007> [<https://perma.cc/NL3L-2RQX>] (last visited July 13, 2017).

271. An Act To Revise and Codify the Laws Relating to Patents and the Patent Office, and to Enact into Law Title 35 of the United States Code Entitled “Patents,” Pub. L. No. 82-593, § 101, 66 Stat. 793, 804 (1952) (codified as amended at 35 U.S.C. § 154(d) (2012)).

272. *See id.*

273. Actual notice need not come from the patent owner, but the patent owner can satisfy that requirement. *See Rosebud LMS Inc. v. Adobe Sys. Inc.*, 812 F.3d 1070, 1074 (Fed. Cir. 2016).

274. *See* 35 U.S.C. § 122(b).

275. *See Data Visualization Center: First Office Action Pendency*, *supra* note 21.

cycles, six months of damages may constitute a significant amount of damages from a particular product.

Practitioners should consider in appropriate cases an even more refined prosecution tactic. First, it may be useful to file an application with a narrow claim set in order to get them published, and then allowed, and continue prosecution. Second, if a practitioner amends claims, it may be useful to request republication<sup>276</sup> of the claims as amended if issuance of those claims is anticipated.

*c. Draft Claims with 3D Printing in Mind*

Patents typically claim a product, a process of making a product, or a process of doing some task (though they can also claim a product made by performing a claimed method). Imagine, for example, a claim to a new smoking pipe. Imagine 3D Printer Company makes 3D printers, a third party—Author—writes a CAD file that will allow that 3D printer to make an infringing pipe, a website—“CADster”—distributes all sorts of CAD files, including Author’s and, finally, a consumer buys a 3D printer, downloads Author’s CAD file from CADster, and prints an infringing pipe.

In this scenario, the consumer would directly infringe (and, if the patent contained a claim to make the pipe using a 3D printer, that claim, too, would be infringed). But, for the reasons stated above and as others have observed, suing every consumer is simply not viable as a practical matter.

A direct infringement claim against any other potential defendant will fail. Author has not made a pipe, nor has CADster sold (or transferred) a pipe, and 3D Printer Company did not make a pipe. Some have argued that someone who writes (Author) or sells (CADster) the CAD file “sells” the invention.<sup>277</sup> This is simply incorrect: a file with software to make a patented pipe is not the sale of the patented pipe. Even if a CAD file provides instructions on how to make a pipe, it is not a pipe; likewise, a 3D printer capable of printing a pipe is not a pipe. Others have suggested that courts may attempt to create new approaches to the application of product claims to 3D printing.<sup>278</sup> While anything is of course possible, efforts to blur the lines between a method claim—describing how to make something—and a product claim—the thing made—run against the

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276. 37 C.F.R. § 1.221 (2017).

277. Timothy R. Holbrook & Lucas S. Osborn, *Digital Patent Infringement in an Era of 3D Printing*, 48 U.C. DAVIS L. REV. 1319, 1356 (2015).

278. See James M. Beck & Matthew D. Jacobson, *3D Printing: What Could Happen to Products Liability when Users (and Everyone Else in Between) Become Manufacturers*, 18 MINN. J.L. SCI. & TECH. 143, 158–59 (2017).

plain language of the Patent Act and raise concerns about the definiteness and enablement of a such a claim.

The pipe patent owner could, however, assert *indirect* infringement: that Author, CADster, or 3D Printer Company either induced or contributed to the direct infringement by the consumer. For reasons others have explained, these theories will likely fail as a matter of law or, even if potentially successful, raise difficult enforcement issues.<sup>279</sup>

What this means is that practitioners should consider including claims that broaden the potential for infringement.<sup>280</sup> Plainly, claims that are directed to using a 3D printer to make a product, or the process of making the product by using a 3D printer, will only capture the consumer. The other possible way to provide patent protection in this context is to claim a CAD file that enables the product to be made rather than the product itself. That claim runs into a fundamental limitation on patents: printed matter is not eligible for patenting.<sup>281</sup> It may be possible to claim memory in a 3D printer configured to print a patented product, but even then the applicant must fully describe and enable that claim.

*d. Trim the Portfolio More Rapidly*

Existing US utility patents expire either seventeen years after they issue or twenty years after the application which led to them was first filed, depending on when the application was filed.<sup>282</sup> However, in order to keep a patent in force, the owner must pay “maintenance fees” to the USPTO every few years.<sup>283</sup>

Given the fact that, generally speaking, the future holds shorter product life cycles, it may make less sense in some industries for clients to continue paying these fees for patents on a growing number of products, as they more quickly become obsolete. To put this thought into concrete terms:

- DVDs were just being introduced in 1997, but actual players did not become widely and cheaply available until the year 2000.<sup>284</sup>

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279. Holbrook & Osborn, *supra* note 277, 1356.

280. See Schwarz et al., *supra* note 256, at 2.

281. See *id.*

282. See Margaret M. Dunbar, *Law Changes Affect Patents in Force*, 38 ADVOCATE 13, 13 (1995).

283. See *Maintain Your Patent*, *supra* note 8.

284. Thomas K. Arnold, *DVD Timeline*, USA TODAY (2008), <https://perma.cc/5SKE-DGRF> [<https://perma.cc/NDJ6-966W>] (“1999 April. . . . DVD player shipments hit 2 million to date. . . . December. 4 million U.S. households have DVD players. 2000 . . . December. DVD players are in

- In 1995, eight megabytes of random-access memory (RAM) had become the norm, up from four megabytes a year before.<sup>285</sup>
- Rewritable CDs first appeared in 1997.<sup>286</sup>
- In late 1997, only 22 percent of Americans had access to the Internet from home, work, or school.<sup>287</sup>
- In 1996, the average amount of time spent online, for those who had access, was thirty minutes each month.<sup>288</sup>

It is hard for us to understand exponential change. The technology two years from now will be as different from today as today is from 2007, when the iPhone was introduced. Just as rewritable CDs are no longer a significant portion of computer storage, today's "cutting edge" technology of SSD memory and the like will probably appear just as antiquated—not in ten years, but in two years. Practitioners in fields where this rapid shift will occur need to consider it in advising clients.

*e. Counsel Clients on the Impact of Innovation on Coercive Relief  
Because That Impacts Other Reasons They May Be Seeking or  
Acquiring Patents*

This Article focuses on one benefit in the cost-benefit calculation for patenting—the potential for coercive relief, which is a “key driver” in the patenting decision. That potential is diminished. Clients may not understand that the decreased capacity to use patents to obtain coercive relief may reduce other benefits of patenting.

For example, venture capitalists have looked at possessing patents as a factor in whether to make an investment.<sup>289</sup> But part of

more than 13 million homes.”); Steven E. Schoenherr, *DVD*, AUDIO ENGINEERING SOC’Y (Aug. 24, 2001), <http://www.aes.org/aeshc/docs/recording.technology.history/dvd.html> [https://perma.cc/5SKE-DGRF] (“1997—In March, the first DVD player went on sale in the U.S. . . . 2000—8,500,000 DVD players sold in the U.S., raising the total sold since 1997 to 13,922,000.”).

285. Paul De Groot, *Here’s the Fall ‘95 Version of a Basic Computer*, MONTREAL GAZETTE, Mar. 3, 1991, at C2, <http://www.relativelyinteresting.com/wp-content/uploads/2012/02/fall1+1995+computer.jpg> [https://perma.cc/TB94-K3YV].

286. *The History of The CD—The CD Family*, PHILIPS, <https://www.philips.com/a-w/research/technologies/cd/cd-family.html> [https://perma.cc/YY5N-M4UB] (last visited Sept. 19, 2017).

287. U.S. CENSUS BUREAU, USE OF INTERNET AT HOME, SCHOOL, AND WORK BY PEOPLE 3 TO 17 YEARS: OCTOBER 1997 (1999), <https://www2.census.gov/programs-surveys/demo/tables/computer-internet/1997/p20-522/tab11.pdf> [https://perma.cc/G8RD-XLQF].

288. Farhad Manjoo, *Jurassic Web: The Internet of 1996 Is Almost Unrecognizable Compared with What We Have Today*, SLATE (Feb. 24, 2009, 5:33 PM), [http://www.slate.com/articles/technology/technology/2009/02/jurassic\\_web.html](http://www.slate.com/articles/technology/technology/2009/02/jurassic_web.html) [https://perma.cc/VVT5-CMLJ].

the reason for that is the coercive aspect of patent rights.<sup>290</sup> To the extent that patents no longer indicate correct business strategy, patenting will no longer be looked at as a positive. Likewise, while an inventor may believe receiving a patent is a positive “credential,” a business must weigh that benefit against the costs of obtaining a patent in light of the reduced coercive benefit the patent brings to the business. Finally, to many businesses, the cost of enforcing patents is a key reason to forego patenting altogether.<sup>291</sup> Clients should be aware that those costs now include having to defend a post-grant proceeding. More broadly, because asserting a patent means jeopardizing it, it means losing all other benefits associated with patenting.

Practitioners whose clients obtain patents for reasons other than the coercive benefit may need to counsel clients more closely. It may be that patent law does not matter to a particular client’s decision to invest in a patent application and incur its attendant costs,<sup>292</sup> but coercive rights may be the determining motivation for a particular client to apply, or not.

#### VI. CONCLUSION: BROADER CONSIDERATIONS FOR POLICY MAKERS

An immediate issue for policy makers is 3D printers. As shown above, patent owners have limited means to address their capacity to copy patented products. Accordingly, Congress should hold hearings on their impact. It may be that the Patent Act should be amended to define the making, using, or selling of a CAD file capable of printing an infringing product as being an act of infringement. Other mechanisms may be also available, such as regulating 3D printers by, for example, requiring printers to monitor for CAD files that infringe.<sup>293</sup>

In addition, as the pace of innovation increases, competitors will be able to more quickly market products that improve on an innovators product. It is important for courts to carefully construe patent claims to avoid reading them too broadly, but it will be difficult

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289. See Sichelman & Graham, *supra* note 16, at 159; Lemley, *supra* note 15, at 41; Joseph Hadzima, Bruce Bockmann & Alexander Butler, *IP in Early Stage Commercial and Investment Success*, INTELL. ASSET MGMT., Mar.–Apr. 2010, at 52, 52.

290. Sichelman & Graham, *supra* note 16, at 130.

291. *Id.* at 167–68.

292. Lemley, *supra* note 15, at 49–50.

293. Not surprisingly, on January 31, 2017, the USPTO issued U.S. Patent No. 9,558,330, relating to “[t]echnologies for digital rights management of 3D printable models.” Technologies for Digital Rights Management of 3D Printable Models, U.S. Patent No. 9,558,330 (filed Jan. 31, 2017).

for courts to do so when the innovation occurs so quickly. By way of illustration, a court will look skeptically at the argument that a patent issued in 2008 on a thumb drive somehow covers holographic storage devices, but the speed of innovation may soon be such that products as differentiated as those two will be developed just a year apart, rather than a decade apart. By strictly applying doctrines such as enablement and written description, courts can ensure that patents do not “block” downstream improvements that, although closer in time, are far apart technologically.

Beyond that, it is too soon to gauge the precise degree of impact on the incentive to patent caused by changes to the law during this century. In this regard, a former Chief Judge of the Federal Circuit recently argued that the impact of recent case law and the rise of post-grant proceedings mean that further congressional “reform” would be questionable and counterproductive.<sup>294</sup> Staying the course may be wise. In a few years, perhaps policy makers will have a better grasp on whether patents continue to be viewed as valuable means to protect inventions. Presumably, if there is by then a significant decline in patent applications, policy makers will consider whether the function of patents—including encouraging disclosure to foster future innovation—is being met sufficiently through other means. If not, legislative recalibration may be in order.

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294. Paul R. Michel, *Judicial Litigation Reforms Make Comprehensive Patent Legislation Unnecessary as well as Counterproductive*, 14 NW. J. TECH. & INTEL. PROP. 131, 135 (2016).