

## THE ROLE OF IP IN ECONOMIC GROWTH – LOOKING BACK, LOOKING FORWARD

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In contemplating intellectual property (IP) policy to drive growth, it is important to understand past experience and use that understanding to shape future perspective. This paper will provide perspective on the IP system's past, specifically over the last 10 years. It will then examine the IP system today. And finally, this paper will look forward, in an effort not to predict the future but to provide a sense for what policy makers will need to consider to align the IP system with clear technological and economic trends, to optimally participate in global economic opportunity as we move into the third decade of the 21st century. Though much of this paper focuses on the U.S. system, the points explored apply globally.

### **Past Ten Years**

Ten years ago, there was widespread belief that the IP system was “broken”. That was certainly true in the U.S., and likely in other countries as well although not in Japan. It was believed that U.S. patents were too strong. Included in this belief was concern over abuse of the patent system, and fear of patent trolls, companies which hold patents but do not actually use the patented technologies to

make products.<sup>1</sup> A 2006 article captured the concern over trolls and how they utilize patents, describing them as:

a creature of opportunity. Patent trolls take full advantage of the expense facing a patent infringement defendant, the inherent unpredictability of jury outcomes and the threat of a permanent injunction if the defendant loses, to extort billions of dollars from unsuspecting, risk-adverse companies through settlements or licenses. The patent troll provides no value to the patent system, other than to line its own pockets. Rather, it stifles innovation and increases frivolous litigation. Patent troll litigation is on the rise, and it is time for targeted defendants to fight back.<sup>2</sup>

In fact, concerns over trolls became so prevalent that they began shaping potential defendants' actions. For example, cloud service providers such as Amazon, Google, and Microsoft, reshaped their user agreements to provide better protection against—and deter in the first place—suits by patent trolls.<sup>3</sup> The underlying logic was that patent-holding trolls were willing to threaten small users of these cloud services, who might be unable to bear the risks involved in fighting against trolls.<sup>4</sup> The cloud providers hoped that by offering stronger protection to their customers and forcing trolls suing them to go up against not just small, unsophisticated entities, but also the large cloud providers behind them, such suits would be preempted, at least to a degree.<sup>5</sup>

Courts and legislators, especially in the United States, heeded the concerns over the patent system and acted in response. In a series of cases, all within the last 10 to 15 years, the U.S. Supreme Court has cut away at the strength of patents. The 2006 *eBay* decision stopped automatic injunctions against patent infringement, and has resulted in fewer injunctions being sought and granted.<sup>6</sup> The next year, the Supreme Court in *KSR* reframed how the “nonobviousness” requirement for patentable inventions is assessed, making the analysis less rigid and more exacting, and making it more difficult to secure patent rights.<sup>7</sup> In 2014, in a decision described as “clearly concerned about preventing patent drafters from intentionally injecting ambiguity into claims[,]”<sup>8</sup> the Supreme Court altered the standard for indefiniteness in *Nautilus*, creating a “reasonable certainty” test and rejecting the previous standard under which indefiniteness meant “‘not amenable to construction’ or ‘insolubly ambiguous.’”<sup>9</sup> That same year, its holdings in *Octane Fitness* and *Highmark* afforded judges more discretion in deciding whether fee-shifting is proper in patent cases, thereby making it easier to award attorneys’ fees.<sup>10</sup> The Supreme Court also reduced the reach of the patent system by limiting the scope of patentable subject matter in the *Mayo*, *Prometheus*, and *Alice* cases, which are discussed below. And finally, earlier this year, the Supreme Court reversed longstanding law and limited the strength of patent rights in the *Lexmark* case, holding that the patent exhaustion doctrine—which precludes patent holders

from enforcing their patent rights after selling a patented product—automatically applies (and cannot be circumvented), even when the patented item is sold outside the U.S.<sup>11</sup>

And the U.S. judiciary’s role in cutting patent strength has not been limited to its case decisions. In 2015, the Judicial Conference heightened the pleading standards for patent cases, adding new requirements in law suit pleadings making it more exacting for a patent holder to enforce its rights against an alleged infringer.<sup>12</sup>

U.S. legislators have also worked during the past ten years to scale back the patent system. Most notable was the 2011 passage of the America Invents Act, or AIA. Among other changes, the AIA introduced a post-grant review system, providing a robust new opportunity to invalidate granted patent rights.<sup>13</sup>

Procedures involved in one form of post-grant review, Inter Partes Review, reflect these goals. For example, in assessing a patent in these reviews, there is no presumption of validity, thus making it easier to invalidate patents using this system.<sup>14</sup> Other parts of the AIA made it easier to submit prior art during patent prosecution, enlarged the kinds of documents that qualify as prior art and removed subjective elements of the U.S. patent system like its “first to invent” rule.<sup>15</sup> It is

fair to say the AIA was largely about addressing perceived abuses in the U.S. patent system brought on by its extreme strength. As one member of Congress commented on the Congressional Record during the Floor debate on the AIA: “The America Invents Act will . . . improve the quality of patents that are issued; and it will provide more certainty in litigation . . . . Patents of low quality and dubious validity . . . enable patent trolls who extort unreasonable licensing fees from legitimate businesses, and constitute a drag on innovation.”<sup>16</sup>

State legislatures also joined in on efforts to rein in patent strength. As of May 2014, over half of U.S. states had passed or introduced patent legislation, and it was reported that “[s]ome new state laws allow companies to sue so-called ‘patent trolls’ in state courts, while setting tougher rules around demand letters—such as a requirement for clear evidence that a company has infringed on a patent, rather than vague accusations.”<sup>17</sup>

Despite these major reforms to the U.S. patent system between about 2006 and 2011, concerns persisted. Prominent among such concerns was the occurrence of “patent wars.” The smartphone patent war, in which the most notable opponents were—and indeed remain—Apple and Samsung, became so extensive that it was estimated up to \$20 billion had been spent on litigating and buying patents in the

course of just two years.<sup>18</sup> But the reality over the past ten years, and much further back than that, is that patent litigation is more “variable and complex” than can be captured in a single dispute, or even a series of related ones. And even while some claimed the patent wars were a sign litigation remained out of control, in the last few years at least, it has “shown signs of decline.” In addition, history tells us that industries experiencing patent wars in the past have not only survived their wars, but thrived during and afterwards.<sup>19</sup> Nevertheless, the patent “wars” of the last decade have been viewed by many as evidence that patents are primarily preemptive in nature and that only further legislative weakening of patent protection will avoid stifled innovation. These views are perhaps best captured by influential U.S. Judge Richard Posner, who, as reported in a 2012 article, said: “There’s real chaos” and “[t]he standards for granting patents are too loose.”<sup>20</sup>

Adding to the perception that the patent system was exceeding its proper bounds was the supposed friction between standard essential patents and the antitrust regime. Standard essential patents, or SEPs, are patents that standard-setting organizations, or SSOs, designate as a requirement for meeting a technical standard. The “friction” with antitrust, it was believed, comes in the form of phenomena such as patent hold-up and royalty stacking and broken F/RAND

norms. The theory of patent hold-up portends that SEP holders will take advantage of their status as a mandatory component of a technical standard by demanding excessive royalties, thereby “holding up” those who might otherwise enter the market covered by the standard. Royalty stacking posits that, as SEPs proliferate, royalties will add up to such a high level that the cost of the SEP-implementing products will rise to where manufacturing these products will no longer be viable. And the notion that F/RAND norms are broken contends that these norms, under which SSOs require that members license their applicable patents on terms that are “Fair, Reasonable, and Non-Discriminatory,” are failing to protect against excessively high SEP royalties, thus detracting from their intended pro-competitive effect.<sup>21</sup> Though these theories each sounded intimidating and plausible ten years ago, intervening data has shown there is no evidence that hold-up, royalty stacking, and the maladies they claim to impose on standards implementers actually occur.<sup>22</sup> Yet, even though all of these phenomena—and, by implication, any frictions they were thought to have caused—have been proven non-existent, concerns persist counter-factually. These erroneous concerns have infected the global discussion around IP and standards, and have remained consequential components of calls for further reform.

Just as courts and the U.S. Congress acted in response to general discontent with the IP system, antitrust regulators heeded the cries for reform by acting

against SEP holders over the last ten years. Authorities in the U.S., Europe, and Asia launched investigations and suits against standards contributors. For example, in April 2014 the European Commission found that Motorola’s attempts at enjoining Apple for infringing Motorola’s SEPs violated the EU’s antitrust rules.<sup>23</sup> Later that year, amendments to the Korea Fair Trade Commission’s (KFTC) Guidelines for Review of Unreasonable Exercise of Intellectual Property Rights included redefining SEPs and more broadly defining what constitutes abusive action by those holding SEPs.<sup>24</sup> In 2015, China’s National Development and Reform Commission closed an investigation into Qualcomm’s licensing practices—including those pertaining to SEPs—by levying a \$975 million fine on the company.<sup>25</sup> And, earlier this year, the U.S. Federal Trade Commission sued Qualcomm, claiming that Qualcomm’s licensing practices violated antitrust law as well as its F/RAND commitments.<sup>26</sup> More generally, in setting aside an exclusion order from the U.S. International Trade Commission against Apple for competition-related reasons in 2013, the U.S. Trade Representative emphasized the importance of “information on the standards-essential nature of the patent at issue if contested by the patent holder and the presence or absence of patent hold-up or reverse hold-up. In addition, the [ITC] should make explicit findings on these issues to the maximum extent possible.”<sup>27</sup>



Court cases also reflected concern over the actions of SEP holders. In the 2013 case *Microsoft v. Motorola*, a U.S. district court held that the “proper methodology” in ascertaining what constitutes a reasonable and non-discriminatory royalty requires accounting for possible royalty stacking.<sup>28</sup> Later that year, another U.S. court in *Innovatio* implicitly echoed the importance of royalty stacking as a factor to consider in ascertaining what constitutes a RAND royalty, though it suggested that this consideration is only relevant where “evaluat[ion of] a proposed RAND rate in the light of the total royalties an implementer would have to pay to practice the standard” indicates so.<sup>29</sup> The next year, the Federal Circuit in *Ericsson* set the bar even higher, explaining that “[t]he district court need not instruct the jury on hold-up or stacking unless the accused infringer presents actual evidence of hold-up or stacking. Certainly something more than a general argument that these phenomena are possibilities is necessary.”<sup>30</sup> These decisions sent the message that U.S. courts were apt to act against SEP holders and in favor of standards implementers seeking low-cost access to patented technologies used in standards, in both instances based on what we now know to be the mistaken belief that supposed abuses of SEP holders required tilting the law in favor of implementers and against innovators. Courts in Asia have also acted against SEP-holders. Among other instances, in September of this year, a South Korean court refused to

suspend an order from the Korea Fair Trade Commission that required Qualcomm to amend its SEP licensing practices.<sup>31</sup>

Meanwhile, European courts have taken a very different direction. In the 2015 *Huawei* case, the Court of Justice of the EU placed requirements on both SEP holders and implementers regarding when SEP holders can seek to enjoin implementers.<sup>32</sup> This approach was adopted by German courts in several 2016 cases, which require implementers to respond “diligently” with acceptance or a counteroffer once SEP holders make a F/RAND license offer.<sup>33</sup> The UK court in *Unwired Planet International v. Huawei* elaborated on the meaning of FRAND, holding that courts can look to royalties in licenses that are comparable to the one before them.<sup>34</sup> All of these European decisions have pointed to a recognition that implementers of standards are just as prone to abuse as are innovators and that good policy calls for a balance between the natural interests of all parties to seek advantage, on the one hand implementers seeking to cut their input costs, and on the other hand innovators seeking to improve their returns on investments in innovation deployed through standards.

A particularly sharp example of the response—and, arguably, the over-response—of authorities across the globe to fears of SEPs was the 2015 amendments to the Institute of Electrical and Electronics Engineers Standards

Association (IEEE)'s patent policy. This influential SSO, upon deciding, without any evidence, that its earlier policy required change, began requiring that the determination of reasonable royalty rates account for the "Smallest Salable Patent Practicing Unit," or SSPPU theory.<sup>35</sup> Under this theory, the royalty base for patent license agreements should be determined by the smallest component within a device that practices a given patent. IEEE's generalized adoption of SSPPU theory was misguided in its failure to consider value-adding synergies and downstream complementary effects that result from the combination of patented technology with other elements of a product. But it proceeded nonetheless, fueled by calls from standards implementers to make standards adoption less costly.<sup>36</sup> In addition, the IEEE began prohibiting SEP holders from seeking to enjoin infringers until after adjudication by a court and exhausting first-level appellate review.<sup>37</sup> This change represented yet another concession to implementer interests, and against the interests of the patent holders participating in standards-setting efforts.

One final approach to cutting back on the patent system's strength over the last decade was to restrict what is eligible for patent protection in the first place. In *Bilski*, a 2010 case in which the U.S. Supreme Court held that processes and business methods are not necessarily precluded from patent protection, the Court

nevertheless found that the claims at issue were unpatentable as an abstract idea.<sup>38</sup>

A series of 2012-2014 Supreme Court decisions were notable for more directly restricting what is eligible for patent protection. The Court in *Mayo v. Prometheus* held that a diagnostic method, in this case a relationship between drug metabolite levels and the proper dosage of the drug, was not patentable because it represented a law of nature.<sup>39</sup> The next year, in the *Myriad* case, the Court held that an isolated human gene sequence was not patentable because it was a product of nature.<sup>40</sup>

Finally, in 2014 the Court in *Alice* held that claims to using a computer to manage escrow accounts were also not patentable, because they covered an abstract idea.<sup>41</sup>

These cases severely constricted the U.S. patent system's scope: between 2014 and 2015, the rate at which district courts invalidated patents grew from 15 percent to 44 percent, and the rate at which infringement was found to have taken place dropped from 23 percent to 14 percent.<sup>42</sup>

## **Today**

All of these efforts to cut down on the strength of IP—those from courts, legislatures, and antitrust authorities worldwide—have led us to the IP system as it looks today. Unfortunately, though, today's system is not cured of all ills. Rather, in the U.S., it is a system now plagued by a new abusive phenomenon called “efficient infringement,” whereby well-funded firms simply ignore others’

intellectual property rights, relying on the fact that litigation is unlikely to occur in today's weak patent system, and no more expensive than taking a license when it does occur.<sup>43</sup> It is a system in which the value of patents is so low that 30 percent of U.S. start-ups worth over \$1B have no patents,<sup>44</sup> and where the rate at which start-ups are being created in the U.S. has fallen: in 2014, only about 450,000 new U.S. firms were born, while 500,000 to 600,000 were created "every year from the late 1970s to the mid-2000s."<sup>45</sup> Today's U.S. IP system is one in which patent filings grew by just over 2 percent between 2014 and 2015, and 1.02 percent the year before,<sup>46</sup> as innovators increasingly elect to retain their innovations as trade secrets rather than disclose them to competitors in exchange for weak patent protection.<sup>47</sup> It is a system in which technology contributed to standards is ironically worth much less than technology held out of standards, a system in which standards opt-out is a serious risk,<sup>48</sup> and a system that gives rise to outcomes that seem unfair to innovators, as captured by this 2015 example described by the *Wall Street Journal* as follows: "the man with the best claim to have invented the technology in dispute . . . will have to settle for whatever [products] [his licensee] and his own company can sell until his devices are driven out of the market by cheaper Chinese models or crushed by patent litigation."<sup>49</sup>

The U.S. patent system is currently alone in discriminating against software and biotech innovation, such that important innovations in both of these critical

leadership fields are per-se unpatentable no matter how inventive they are. This remains so, even while the same innovations readily receive patent protection in other important countries from Europe to Asia.<sup>50</sup>

Indeed, the U.S. patent system has now fallen to tenth strongest in the world, tied with Hungary and well behind the strength of the patent systems in many important countries in Asia and Europe.<sup>51</sup>

Globally, we currently know that if a party infringes a patent in China it will be liable for perhaps a few tens of thousands of dollars, perhaps a few million at the extreme, while, if a party is accused of using a patent in China to violate the antitrust laws, it will be liable for perhaps \$1 billion in damages. So we see a huge present day disparity between the positive value of the patent property right, versus the cost of abusing it. And finally, we are faced today with a great divergence in the treatment of standards-deployed innovation, with the U.S. and Asia looking at innovators with open suspicion, while Europe on the other hand sees a need for balance in the treatment of innovators and implementers participating in standards development.

The pervasiveness of today's issues gives rise to an important question: did courts, legislatures, and antitrust authorities tackling the formerly-“too strong” IP system go too far?

## **Looking Forward**

It is against this backdrop—of a system recently perceived as too-strong, then cut down, and now struggling with the consequences of all the weakening change, that we must contemplate the future of IP. In discussing the next 10 years, this paper aims not to provide predictions of what will happen, but rather to highlight what must be done in light of clear trends that have developed.

To put it simply, in planning for the future and crafting policies that shape it, we need to account for the fact that we are in an innovation-driven world. Incenting innovation must be our top priority. No country wants to be relegated to a mere manufacturer's role. Everybody wants to play in the innovation game.

Our immediate future falls within an era called the Fourth Industrial Revolution, one likely defined by “The Internet of Things.”<sup>52</sup> Crucial to this era is the role of standards-deployed innovation, or innovations that are put into the marketplace as part of standards. Such innovations have enabled us, for example, to use our now ubiquitous mobile devices to communicate with others on different networks and different devices in different parts of the world, and such innovations will be even more crucial for human advancement going forward.<sup>53</sup> Innovation-based standards have emerged as the key enablers, the network building blocks that will bring IOT and Fourth Industrial Revolution to life. If the information

technology era dominated progress in the second half of the 20th Century, standards-deployed innovation must dominate the 21st Century.

However, as important as standards-deployed innovations are, they also involve substantial risks, and these risks are borne by the innovators themselves. By contributing to a standard, innovators limit their potential income streams to royalty payments from use of the products that implement the standard.<sup>54</sup> In other words, whereas other innovators might be able to alter the price of their products as a means of adjusting their own potential for income, standards-contributing innovators are limited to income from royalty payments. They have given up feature differentiation by contributing their innovations to standards. Standards-deployed innovators also must agree to license on RAND terms,<sup>55</sup> effectively setting an upper limit on royalties they might receive, and they must disclose their technologies, further increasing the risk they take on. The innovator's value equation for contributing new technology to standards has always been tenuous. That is why past generations of technology advancement have been based largely on the winner-take-all business model that throttles innovation to the pace of a single winner in each technology area.<sup>56</sup> Good for the single winner, but bad for everyone else.



Standards-deployed innovation, on the other hand, creates ecosystems that produce many winners, starting with consumers of the resulting products. For example, as standards for mobile networks progressed from 2G to 3G to 4G, the global average cost per megabyte of cellular data decreased by 99%, and transmission speeds increased by a factor of 12,000.<sup>57</sup> In 2015 alone, mobile technologies generated an estimated annual consumer surplus of 6.4 trillion dollars.<sup>58</sup> All of this is a product of the great innovation-accelerator of the 21st century—the standards-deployed innovation business model. Thus, to ensure that standards-deployed innovators choose to take this risk and contribute to standards, we must actively incent their innovation. That’s where the IP system comes in.

IP rights both reward SEP inventors by allowing them to recoup some of the value invested in past inventions, and enable future innovation by serving as a source of funds for future research and development. For the IP system to successfully incent standards-deployed innovation, we must first be careful going forward not to let antitrust law impede the IP system’s protections, and must look beyond what the U.S. 9th Circuit described as “an obvious tension between the patent laws and antitrust laws.”<sup>59</sup> As the Supreme Court has recognized, intellectual property law modifies antitrust law, not vice versa: “The patent laws which give a 17-year monopoly on ‘making, using, or selling the invention’ are in pari materia with the antitrust laws and modify them pro tanto.”<sup>60</sup> Where IP and

antitrust intersect, then, we must favor innovation as the source of dynamic competition over antitrust's static competition agenda. Unlike antitrust, IP law promotes progress in innovation by incentivizing the efficient resolution of disputes and supporting pooling and cross-licensing arrangements, allowing innovators to cooperate with one another rather than become stuck in deadlock.

Recent actions by the Korean Fair Trade Commission and the U.S. Federal Trade Commission and Department of Justice have created cause for concern on this front. For example, driven largely by fears of patent hold-up, the U.S. FTC and DOJ set out to restrain the enforcement of SEPs, despite, as mentioned above, that hold-up is not a real-world issue and despite that there are other mechanisms already in place to protect against anticompetitive outcomes in the SEP context.<sup>61</sup> The problem with antitrust's encroachment on IP is particularly dangerous because the outcome of such encroachment is not readily apparent, as it is impossible to know "what could have been," had more innovations been incented. Furthermore, when different countries extra-territorially enforce their different antitrust laws, it creates costs for those who have to deal with multiple jurisdictions and are subject to those differing laws. In applying antitrust law to IP, it is also important to heed principles of comity. This means that countries cannot apply their antitrust laws to IP registered or protected under another country's laws, nor can they issue world-wide remedies pertaining to IP, as the KFTC recently did.<sup>62</sup>

So, keeping in mind the changes to our IP system over the last 10 years, its current condition and challenges, and the baseline antitrust interface that should guide how we shape it going forward, and cognizant that the resolution of today's issues should not be the occasion to back slide into the same issues we confronted ten years ago, the question is: what actions should be taken over the next ten years?

One approach is already on the rise among conservative groups in the U.S. such as the Conservative Action Project. This approach reflects a line of thinking contrary to that of the last ten years; it calls for strengthening the IP system on the central belief that IP is "property" to which inventors have an exclusive right just as with real property and tangible personal property, and that a stronger IP system will favor innovator interests internationally and in the trade area.<sup>63</sup>

Rather than offer a specific approach like that of the Conservative Action Project, this paper offers five points that should be incorporated into policies going forward. First, be cautious with further reform; avoid acting too quickly. Second, take care to ground actions in evidence, rather than theory, fear or conjecture. Third, aim to recalibrate the IP system's coverage so as to return to the view that "anything under the sun that is made by man" is patentable.<sup>64</sup> Fourth, recognize

the irreplaceable importance of IP rights to incenting innovation, and, in doing so, be prepared to accept some of the consequences that arise as an inevitable part of a strong IP system. Fifth, and finally, celebrate and protect standards-deployed innovation business models as the highest form of cooperation yet devised.

As to the first point, learn from the mistake of the IEEE in amending its policy prematurely. Changes to the IP system are useful and even necessary, but they must be based in reality. This is where the second point comes in; instead of, for example, following the lead of those who have attacked IP rights out of theoretical fears, or to advantage their own business models, policy makers must assess the reality of the situations they are addressing. Look to data, not just theory. Had those who feared hold-up and royalty stacking heeded this advice, they might have noticed that between 1994 and 2013, as the price of mobile phones fell and the number of manufacturers and devices sold rose, while SEP holders' average gross margin remained constant, suggesting that, as mentioned above, these fears were unfounded.<sup>65</sup>

Regarding the third point, the state of today's patent system suggests that the strategy of narrowing the universe of patentable subject matter does not produce good results. Instead, we are better off widening the reach of the patent system so as not to preclude entire industries from its valuable protections. Fine-grained

doctrines like inventive step and disclosure requirements are far better suited to the heavy lifting of patentability determinations, versus the over broad brush of subject matter discrimination.

As to the fourth point, recall the ways in which innovation has shaped our world thus far, and set policies that will actively incent more innovation into the future. Lean in for innovation and those who make it happen. Doing so requires recognition of the risks that standards-contributing innovators take on, and acting to afford them adequate protection to continue innovating and contributing in light of those risks, something which is central to the fifth point as well. Also implicit in protecting standards-deployed innovation business models is recognizing that implementers will always outnumber their counterparts in “coopetition,” the innovators. And further implicit where there is strong IP protection – there will be disputes. The IP system has always been controversial, because it represents humanity’s long term savings plan for the future, whereby we agree to pay higher prices now in exchange for cures for disease and new products that will come tomorrow. We must accept that if we want to invest for our and our children’s future, it will require accelerating innovation, which will require strong incentives, which will attract some level of disputes and controversy. Stronger IP rights may come with increased disputes, but absent those rights we are surely depriving ourselves and our children of crucial, impactful innovations.

So in the last ten years we have successfully “reformed” IP to prevent abuse. In the next ten, we need to re-fortify it to maximize innovation. We must champion, not punish, those who bravely sacrifice their hard-won innovations to standards for broad ecosystem benefit. We must exercise regulatory humility in the application of antitrust laws to avoid having them discourage the very standards-deployed innovation they should champion. We must employ IP-based incentives so that the Fourth Industrial Revolution and IOT produce all the broad human benefits we know they are capable of producing.

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<sup>1</sup> See e.g. Ashby Jones, *In Fight Against ‘Patent Trolls,’ a New Arrow in the Quiver?*, WALL ST. J.: L. BLOG (Nov. 24, 2008, 8:45 AM), <https://blogs.wsj.com/law/2008/11/24/in-fight-against-patent-trolls-a-new-arrow-in-the-quiver/?mg=prod/accounts-wsj>.

<sup>2</sup> John F. Luman III & Christopher L. Dodson, *No Longer a Myth, the Emergence of Patent Troll: Stifling Innovation, Increasing Litigation, and Extorting Billions*, INTELL. PROP. & TECH. L. J., May 2006.

<sup>3</sup> Chad Ennis and Chris Shield, *It Might be a Bad Idea for NPEs to Attack Cloud Services*, LAW360 (Sept. 1, 2017, 1:00 PM), <https://www.law360.com/articles/958668/it-might-be-a-bad-idea-for-npes-to-attack-cloud-services>.

<sup>4</sup> *Id.*

<sup>5</sup> *Id.*

<sup>6</sup> *eBay Inc. v. MercExchange, LLC*, 547 U.S. 388 (2006); Kirti Gupta & Jay P. Kesan, *Studying the Impact of eBay on Injunctive Relief in Patent Cases* 6-12, (Univ. of Ill. Coll. of Law, Research Paper No. 17-03, 2015).

<sup>7</sup> *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398 (2007).

<sup>8</sup> James R. Barney & J. Derek McCorquindale, *The Supreme Court’s Nautilus Decision Defines the Test for Indefiniteness*, FINNEGAN: IP UPDATES (June 4, 2014), <https://www.finnegan.com/en/insights/the-supreme-court-s-nautilus-decision-defines-the-test-for.html> (discussing and quoting *Nautilus* cases).

<sup>9</sup> *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S.Ct. 2120 (2014); *Boisig Instruments, Inc. v. Nautilus, Inc.*, 715 F.3d 891, 898 (Fed. Circ. 2013).

<sup>10</sup> *Octane Fitness LLC v. Icon Health & Fitness Inc.*, 134 S.Ct. 1749 (2014); *Highmark Inc. v. Allcare Health Management System Inc.*, 134 S.Ct. 1744 (2014); Russell Cass, *The Fee-Shifting*

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*Climate After Octane And Highmark*, LAW360 (Aug. 28, 2014, 7:46 AM),

<https://www.law360.com/articles/568081/the-fee-shifting-climate-after-octane-and-highmark>.

<sup>11</sup> *Impression Prods., Inc. v. Lexmark Int'l, Inc.*, 581 U.S. \_\_\_\_ (2017); Alex Noonan, *Impression v. Lexmark: Supreme Court Reverses Federal Circuit, Limits Scope of Post-Sale Patent Rights*, JOLT DIGEST (Colette Ghazarian ed., June 27, 2017),

<http://jolt.law.harvard.edu/digest/impression-v-lexmark-supreme-court-reverses-federal-circuit-limits-scope-of-post-sale-patent-rights>; Jason Rantanen, *Impression v. Lexmark: Patent Rights Exhausted by Sale, Domestic or Abroad*, PATENTLYO (May 30, 2017),

<https://patentlyo.com/patent/2017/05/impression-exhausted-domestic.html>; Kyle Straughan, *Lexmark Patent Exhaustion*, RUTTER MILLS PLLC (Apr. 18, 2017),

<http://ruttermills.com/Blog/2017/04/Lexmark-Patent-Exhaustion>.

<sup>12</sup> David J. Kappos, *OPINION: Time for Congress To Leave Patent System Alone*, LAW360 (Mar. 28, 2016, 10:10 AM); Matthew Bultman, *Stricter Patent Pleading Requirements Take Effect Dec. 1*, LAW360 (Nov. 30, 2015, 3:55 PM),

<https://www.law360.com/articles/717900/stricter-patent-pleading-requirements-take-effect-dec-1>.

<sup>13</sup> Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (codified in 35 U.S.C.); *Summary of the America Invents Act*, AIPLA,

<http://www.aipla.org/advocacy/congress/aia/Pages/summary.aspx> (last visited Oct. 31, 2017).

<sup>14</sup> See Stacy Lewis & Tom Irving, *Very Few Appreciated Just How Bad AIA Inter Partes Reviews (IPRs) Would Be for Patent Owners, Although IPR Denials Have Been, for Patent Owners, a Glimmer of Hope*, 11 BUFF. INTELL. PROP. L. J. 28, 55, 57 (2015) (contrasting procedures used in Inter Partes Review with those used by district courts).

<sup>15</sup> Cheryl Milone, *A Powerful New Weapon Against Patent Trolls*, FORBES (Nov. 15, 2012, 5:21 PM), <https://www.forbes.com/sites/forbesleadershipforum/2012/11/15/a-powerful-new-weapon-against-patent-trolls/#1f903bc1d282>; *Summary of the America Invents Act*, *supra* note 13.

<sup>16</sup> 157 CONG. REC. S936-53 (statement of Senator Leahy).

<sup>17</sup> Ruth Simon & Angus Loten, *States Revise Laws to Curb 'Patent Trolls': New Legislation Sets Tougher Rules Around Demand Letters*, WALL ST. J.: L. (May 21, 2014), <https://www.wsj.com/articles/states-revise-laws-to-curb-patent-trolls-1400716539>.

<sup>18</sup> Charles Duhigg and Steve Lohr, *The Patent, Used as a Sword*, N.Y. TIMES (Oct. 7, 2012), <http://www.nytimes.com/2012/10/08/technology/patent-wars-among-tech-giants-can-stifle-competition.html>.

<sup>19</sup> See Adam Mossoff, *The Rise and Fall of the First American Patent Thicket: The Sewing Machine War of the 1850s*. 53 ARIZONA L. REV. 165, 170, 211 (2011) (discussing sewing machine war).

<sup>20</sup> Duhigg and Lohr, *supra* note 18.

<sup>21</sup> Yann Ménière, *Fair, Reasonable and Non-Discriminatory (FRAND) Licensing Terms*, European Commission Joint Research Centre, Institute for Prospective Technological Studies, Science and Policy Report (2015), available at <http://is.jrc.ec.europa.eu/pages/ISG/EURIPIDIS/documents/05.FRANDreport.pdf>.

<sup>22</sup> See, e.g., J. Gregory Sidak, *The Antitrust Division's Devaluation of Standard-Essential Patents*, 104 Geo. L.J. Online 48, 61 n.49 (2016) (listing 21 articles which demonstrate that “more than two dozen economists and lawyers had disproved or disputed the numerous assumptions and predictions of the patent-holdup and royalty-stacking conjectures.”).

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<sup>23</sup> European Commission Press Release IP/14/489, Antitrust: Commission Finds that Motorola Mobility Infringed EU Competition Rules by Misusing Standard Essential Patents (Apr. 29, 2014). The EC also found that Samsung's commitments regarding the seeking of injunctions were not in violation of antitrust laws. *See* European Commission Press Release IP/14/490, Antitrust: Commission Accepts Legally Binding Commitments by Samsung Electronics on Standard Essential Patent Injunctions (Apr. 29, 2014). The EC, through these two decisions, states that it "provides legal clarity on the circumstances in which injunctions to enforce standard essential patents can be anti-competitive[.]" thus documenting that the EC in 2014 was paying careful attention to antitrust and SEPs. European Commission Press Release IP/14/489.

<sup>24</sup> Yoon & Yang LLC, *Korea Fair Trade Commission amends Guidelines for Review of Unreasonable Exercise of Intellectual Property Rights*, LEXOLOGY (Jan. 14, 2015), <https://www.lexology.com/library/detail.aspx?g=99282eed-0435-4acc-9d4e-bc9d69c47988>.

<sup>25</sup> Melissa Lipman, *FTC Sues Qualcomm Over Standard-Essential Patent Licenses*, LAW360 (Jan. 17, 2017, 4:27 PM), <https://www.law360.com/articles/881729/ftc-sues-qualcomm-over-standard-essential-patent-licenses>; Benjamin C. Li, *The Global Convergence of FRAND Licensing Practices: Towards Interoperable Legal Standards*, 31 BERKELEY TECH. L. J. 429, 448 (2016).

<sup>26</sup> *See* Lipman, *supra* note 25.

<sup>27</sup> U.S. Tr. Rep., Opinion Letter on Disapproval of the U.S. International Trade Commission's Determination in the Matter of Certain Electronic Devices, Including Wireless Communication Devices, Portable Music and Data Processing Devices, and Tablet Computers, Investigation No. 337-TA-794 (Aug. 3, 2013); *United States Trade Representative Issues Rare Disapproval of U.S. International Trade Commission's Order Excluding Apple Products Based on Infringement of Samsung Standards-Essential Patent*, WILSON SONSINI GOODRICH & ROSATI (Aug. 5, 2013), <https://www.wsgr.com/WSGR/Display.aspx?SectionName=publications/PDFSearch/wsgralrt-president-apple-samsung.htm>.

<sup>28</sup> Richard J. Stark, *The Royalty Stacking Supposition*, CPI ANTITRUST CHRON. (March 2015 at 4) (quoting *Microsoft Corp. v. Motorola, Inc.*, No. C10-1823JLR, 2013 WL 2111217, at \*12 (W.D. Wash. Apr. 25, 2013)).

<sup>29</sup> Stark, *supra* note 28 (quoting *In re innovation IP Ventures, LLC*, 921 F. Supp. 2d 903).

<sup>30</sup> *Ericsson, Inc. v. D-Link Systems, Inc.*, 773 F.3d 1201, 1234 (Fed. Cir. 2014).

<sup>31</sup> *Why South Korea Just Hit Qualcomm with a Record \$854 Million Fine*, FORTUNE (Dec. 27, 2016), <http://fortune.com/2016/12/27/qualcomm-korea-antitrust/>; *South Korean Court Rejects Qualcomm's Request to Suspend Antitrust Body's Order*, REUTERS (Sept. 4, 2017), <https://www.reuters.com/article/us-qualcomm-antitrust/south-korean-court-rejects-qualcomms-request-to-suspend-antitrust-bodys-order-idUSKCN1BF10D>.

<sup>32</sup> *Huawei Technologies Co. Ltd. v. ZTE Corp., ZTE Deutschland GmbH* (Case C-170/13), July 16, 2015.

<sup>33</sup> Hetti Hilge, *German FRAND Update*, KLUWER PATENT BLOG (June 28, 2016), <http://patentblog.kluweriplaw.com/2016/06/28/german-frand-update/> (discussing *Sisvel Wireless Patent Portfolio v. Qingdao Haier Group*, 15 U 65/15 (Oberlandesgericht Düsseldorf Jan. 13, 2016)); *see also* Christa Brown-Sanford & Bethany R. Ford, *Post-Huawei FRAND Licensing of Standards-Essential Patents*, BAKER BOTTS (June 2016), <http://www.bakerbotts.com/ideas/publications/2016/06/ip-report-post-huawei-frand-licensing> (also discussing *Sisvel v. Haier*); *Sisvel: Düsseldorf Court of Appeal Hands Down First Decision on FRAND*, BUSINESS WIRE (Jan. 22, 2016, 7:03 AM),



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<http://www.businesswire.com/news/home/20160122005397/en/Sisvel-D%C3%BCsseldorf-Court-Appeal-Hands-Decision-FRAND>; *but see* Andrea Minuto Rizzo, *Injunctions for Infringement of FRAND-Encumbered Standard Essential Patents: The Sisvel v. Haier Judgment of the Düsseldorf Court*, 4 ITALIAN ANTITRUST REV., no. 1, at 65, 68 (arguing that the *Sisvel* appellate decision “opens up the possibility for . . . start[ing] with only a vague or non-FRAND offer.”).

<sup>34</sup> Birss J, *Unwired Planet v. Huawei* ([2017] EWHC 711 (Pat) [806(10)], 5 Apr. 2017]

<sup>35</sup> IEEE Standards Association, *Standards Board Bylaws*, § 6.1.

<sup>36</sup> Roy E. Hoffinger, *The 2015 DOJ IEEE Business Review Letter: The Triumph of Industrial Policy Preferences Over Law and Evidence*, 3 CPI Antitrust Chron., Mar. 2015, at 6; J. Gregory Sidak, *Testing for Bias to Suppress Royalties for Standard-Essential Patents*, 1 Criterion J. Innovation 301, 301, 330-31 (2016); IEEE Standards Association, *supra* note 35, at § 6.1-6.2.

<sup>37</sup> IEEE Standards Association, *Standards Board Bylaws*, § 6.2.; J. Gregory Sidak, *Testing for Bias to Suppress Royalties for Standard-Essential Patents*, 1 CRITERION J. INNOVATION 301, 301 (2016); *see* Roy E. Hoffinger, *The 2015 DOJ IEEE Business Review Letter: The Triumph of Industrial Policy Preferences Over Law and Evidence*, 3 CPI ANTITRUST CHRON., Mar. 2015, at 7.

<sup>38</sup> *Bilski v. Kappos*, 561 U.S. 593 (2010); *see also* Gene Quinn, *Supremes Decide Bilski: Machine or Transformation Not the Only Test, Bilski Not Patentable*, IPWATCHDOG.COM (June 28, 2010), <http://www.ipwatchdog.com/2010/06/28/supreme-court-decides-bilski/id=11299/>.

<sup>39</sup> *Mayo Collaborative Servs. v. Prometheus Labs, Inc.*, 566 U.S. 66 (2012).

<sup>40</sup> *Ass’n for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576 (2013).

<sup>41</sup> *Alice Corp. Pty. Ltd. v. CLS Bank Int’l*, 134 S. Ct. 2347 (2014).

<sup>42</sup> *Kappos*, *supra* note 12.

<sup>43</sup> *See* David Kappos, Richard Ludwin & Marc Ehrlich, *From Efficient Licensing to Efficient Infringement*, 255 NEW YORK L. J. (Apr. 4, 2016).

<sup>44</sup> *Id.*

<sup>45</sup> Heather Long, *Where Are All the Startups? U.S. Entrepreneurship Near 40-Year Low*, CNN MONEY (Sept. 8, 2016, 10:10 AM) <http://money.cnn.com/2016/09/08/news/economy/us-startups-near-40-year-low/index.html>.

<sup>46</sup> U.S. PATENT AND TRADEMARK OFFICE PATENT TECHNOLOGY MONITORING TEAM, U.S. PATENT STATISTICS CHART CALENDAR YEARS 1963 – 2015 (2016).

<sup>47</sup> *See* Michael P. Kahn & Matthew B. Weiss, *Trends in Patents and Trade Secrets Change Landscape of Innovation*, N. Y. L. J., June 30, 2016 (noting that (before 2014-2015) Myriad “is reported to have responded to the loss of several of its patent claims in a §101 challenge, by moving toward the use of trade secret protection”) (internal citation omitted).

<sup>48</sup> *See* Joshua D. Wright, Commissioner, Fed. Trade Comm’n, SSOs, FRAND, and Antitrust: Lessons from the Economics of Incomplete Contracts, Remarks at the Center for the Protection of Intellectual Property Inaugural Academic Conference, George Mason University School of Law 26-31 (Sept. 12, 2013) (“Imposing more restrictive terms can undermine key players’ incentives to join SSOs and/or contribute technology[.]”); Maureen K. Ohlhausen, Commissioner, Fed. Trade Comm’n, ANTITRUST OVERSIGHT OF STANDARD-ESSENTIAL PATENTS: THE ROLE OF INJUNCTIONS, Address at 2015 IP and Antitrust Forum, China Intellectual Property Law Association (Sept. 12, 2015) at 10 (discussing opt-out “not . . . as a general case, but . . . to illustrate the danger of absolutes”).

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- <sup>49</sup> Christopher Mims, *How 'Hoverboards' Epitomize Our Broken Patent System*, WALL ST. J. (Dec. 20, 2015) <https://www.wsj.com/articles/how-hoverboards-epitomize-our-broken-patent-system-1450674060>.
- <sup>50</sup> See Ania Jedrusik & Phil Wadsworth, *Patent Protection for Software-Implemented Inventions*, WIPO MAGAZINE, Feb. 2017.
- <sup>51</sup> U.S. CHAMBER OF COMMERCE GLOBAL INTELLECTUAL PROPERTY CENTER, U.S. CHAMBER INTERNATIONAL IP INDEX: PATENTS (2017), available at <http://www.theglobalipcenter.com/ipindex2017-chart/>.
- <sup>52</sup> See, e.g. Sayyidul Arafat, *The Dawn of the Fourth Industrial Revolution*, IBM: INTERNET OF THINGS BLOG (Dec. 6, 2016), <https://www.ibm.com/blogs/internet-of-things/dawn-of-the-fourth-industrial-revolution/> (predicting that the Internet of Things will play a large role in the fourth industrial revolution).
- <sup>53</sup> David J. Kappos, *Innovation-Based Technology Standards—Vital Contributors to U.S. Economic Growth and Consumer Prosperity Under Growing Threat* 1, 6 (Working Paper).
- <sup>54</sup> *Id.* at 4.
- <sup>55</sup> *Id.*
- <sup>56</sup> *Id.* at 2-3.
- <sup>57</sup> Julio Bezerra, Wolfgang Bock, Francois Candelon, et al., *The Mobile Revolution: How Mobile Technologies Drive a Trillion-Dollar Impact*, Boston Consulting Group (2015), available at [https://www.bcgperspectives.com/content/articles/telecommunications\\_technology\\_business\\_transformation\\_mobile\\_revolution/](https://www.bcgperspectives.com/content/articles/telecommunications_technology_business_transformation_mobile_revolution/).
- <sup>58</sup> *Id.*
- <sup>59</sup> U.S. v. Westinghouse Elec. Corp., 648 F.2d 642, 646 (9th Cir. 1981).
- <sup>60</sup> Simpson v. Union Oil co. of Cal., 377 U.S. 13, 24 (1964).
- <sup>61</sup> See, e.g. Complaint at 19, 25-26, 28, In re Motorola Mobility LLC and Google Inc., FTC Docket No. C-4410 (2013); Renata Hesse, Deputy Assistant Att’y Gen., U.S. Dep’t of Justice, Six “Small” Proposals for SSOs Before Lunch, Remarks as Prepared for the ITU-T Patent Roundtable 5, 9 (Oct. 10, 2012).
- <sup>62</sup> See Koren W. Wong-Ervin et al., *Extra-Jurisdictional Remedies Involving Patent Licensing*, COMPETITION POL’Y INT’L (forthcoming George Mason University Law & Economics Research Paper Series); *South Korean Court Rejects Qualcomm’s Request to Suspend Antitrust Body’s Order*, REUTERS (Sept. 4, 2017), <https://www.reuters.com/article/us-qualcomm-antitrust/south-korean-court-rejects-qualcomms-request-to-suspend-antitrust-bodys-order-idUSKCN1BF10D>.
- <sup>63</sup> *Economic Competitiveness and the Defense of Intellectual Property*, CONSERVATIVE ACTION PROJECT (Oct. 17, 2017), <http://conservativeactionproject.com/economic-competitiveness-and-the-defense-of-intellectual-property/>.
- <sup>64</sup> Diamond v. Chakrabarty, 447 U.S. 303, 309 (1980) (quoting S. Rep. No. 1979, 82d Cong., 2d Sess., 5 (1952); H.R. Rep. No. 1923, 82d Cong., 2d Sess., 6 (1952)).
- <sup>65</sup> Alexander Galetovic & Kirti Gupta, *Royalty Stacking and Standard Essential Patents: Theory and Evidence from the World Mobile Wireless Industry* 5, Figure 2 (2017), <https://ssrn.com/abstract=2790347>.