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# TEN THINGS TO DO ABOUT PATENT HOLDUP OF STANDARDS (AND ONE *NOT* TO)

MARK A. LEMLEY\*

**Abstract:** A central fact about the information technology sector is the multiplicity of patents that innovators must deal with. Indeed, hundreds of thousands of patents cover semiconductor, software, telecommunications, and Internet inventions. Because of the nature of information technology, innovation often requires the combination of a number of different patents. Currently, various features of the patent system facilitate holdup, particularly in the standard-setting context. These features include insufficient discounting in damages for patent infringement and the resultant inflated demands for royalties, the low standard of proof for willful infringement, which allows patentees to recover treble damages, and the threat of injunctive relief. Frequently, innovators make irreversible investments in their development of new technology, only to have those investments used against them as a bargaining chip by existing patent holders. This Article suggests five steps that standard-setting organizations may take to reduce the problem of patent holdup and five ways the law should change to deal with the problem.

## INTRODUCTION

The U.S. Congress, the courts, scholars, and the press have focused more and more attention on what is shaping up to be the central public policy problem in intellectual property (“IP”) law today: the problem of holdup by patent owners, particularly but not exclusively in the context of standard setting. In this Article, I suggest ten things we might do to deal with this problem, and at least one thing we probably ought not to do.

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\* © 2007, Mark A. Lemley. William H. Neukom Professor of Law, Stanford Law School; Of Counsel, Keeker & Van Nest LLP. Thanks to Chris Cotropia, Daralyn Durie, Rose Hagan, Herb Hovenkamp, Doug Lichtman, David McGowan, Gil Ohana, Phil Weiser, members of the Intellectual Property Inns of Court, and participants in the Standardization conference at Stanford Law School and the Owning Standards conference at Boston College for comments on an earlier version. This is an edited version of a speech I gave at the Owning Standards conference.

## I. THE PROBLEM

Why is holdup a problem today? The patent system was designed for an era in which a patent covered a machine, and a machine was a fairly basic thing.<sup>1</sup> As Rob Merges puts it, one hundred years ago “if you put technology in a bag and shook it, it would make some noise.”<sup>2</sup> The kinds of things subject to patent protection had a fairly uniform character.<sup>3</sup>

That uniform character is gone. We now have a patent system that, while unitary in nature, has to accommodate pharmaceuticals and biotechnology, DNA, mechanical devices, medical devices, computer software, computer hardware, and the Internet. What works well in some of those industries does not work well in others.<sup>4</sup>

In particular, the one central fact about the information technology (“IT”) sector—including the Internet, semiconductors, telecommunications, computer hardware, and computer software—is the multiplicity of patents that developers must deal with. This is not a problem pharmaceutical companies generally encounter.<sup>5</sup> Although sometimes a drug requires multiple patented inputs—and there have been efforts to try to obtain multiple patents on the same drug<sup>6</sup>—generally, one patent covers one drug. By contrast, in the IT industries, there are usually multiple patents—sometimes hundreds or even thousands—on each new product.<sup>7</sup>

There are over 1.3 million patents in force right now in the United States, and that doesn’t count the more than 50% that are dropped for failure to pay maintenance fees at some time in their lives.<sup>8</sup> These 1.3 million are just the ones that people are willing to

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<sup>1</sup> Robert P. Merges, *As Many As Six Impossible Patents Before Breakfast: Property Rights for Business Concepts and Patent System Reform*, 14 BERKELEY TECH. L.J. 577, 585 (1999).

<sup>2</sup> *Id.* at 584.

<sup>3</sup> *Id.*

<sup>4</sup> For more detailed discussion, see Dan L. Burk & Mark A. Lemley, *Policy Levers in Patent Law*, 89 VA. L. REV. 1575, 1630–38 (2003).

<sup>5</sup> *See id.* at 1679–80.

<sup>6</sup> *See* 2 HERBERT HOVENKAMP ET AL., *IP AND ANTITRUST: AN ANALYSIS OF ANTITRUST PRINCIPLES APPLIED TO INTELLECTUAL PROPERTY LAW* § 33.9, at 33–46 (2005) (discussing efforts to “evergreen” patents on drugs).

<sup>7</sup> *See* Burk & Lemley, *supra* note 4, at 1630–38.

<sup>8</sup> Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 NW. U. L. REV. 1495, 1504 (2001). Patents approved before 1995 are in force for seventeen years, so all patents since November 1989 are potentially enforceable today. There are approximately 2,185,000 such utility patents (utility patent number 4,800,000 was issued in January 1989, and patent number 6,985,000 was recently issued); about 40% of those patents have lapsed for failure

continue paying money to hold onto because they think they might turn out to be useful. A significant percentage of these patents are in the IT sector.<sup>9</sup> Hundreds of thousands of patents cover semiconductor, software, telecommunications, or Internet inventions.<sup>10</sup>

There are so many IT patents because of the nature of these technologies and the ways in which they interact; it is almost always the case that a product in the IT field combines a number of different components and therefore a number of different patents.<sup>11</sup> Therein lies the basic problem. In the pharmaceutical industry, the medical device field, or the traditional mechanical field, an individual may only have one or two patents covering his invention. In IT, however, one product regularly involves the combination of 50, 100, even 1000, or—as Intel lawyers themselves say with respect to their own core microprocessor—5000 different patent rights.<sup>12</sup> All of those patent rights must be cleared in order to get the product to market.

Can we solve this problem by getting rid of bad patents? I think the answer is no, and in any event I'm not sure that we would want to. It seems to me quite reasonable to conclude that there are a number of significant inventions in the IT sector that deserve patent protection. There are also a number of bad patents out there that do not deserve protection. But even if the government were really good at weeding out all the bad patents, that wouldn't solve the component problem. There would still be a number of real patents out there that would have to be dealt with. Furthermore, the government is unlikely to weed out the bad patents early enough to make a difference, at least not in a cost-effective way. The Patent & Trademark Office (the "PTO") can't spend enough time and money evaluating all of these patents before it knows which ones are really important, so we can't count on it to weed out bad patents.<sup>13</sup> That means that there will be a large number of patents, some good and some bad, covering any technology in the IT sector.

This creates a problem because various features of the patent system facilitate holdup.<sup>14</sup> Patent owners in these component technology

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to pay maintenance fees, according to the best weighted-average estimate. *Id.*; Kimberly A. Moore, *Worthless Patents*, 20 BERKELEY TECH. L.J. 1521, 1526 (2005).

<sup>9</sup> See Moore, *supra* note 8, at 1536.

<sup>10</sup> See *id.*

<sup>11</sup> See *id.*

<sup>12</sup> Conversation with David Simon, Patent Counsel, Intel Corp., Sept. 12, 2006.

<sup>13</sup> Lemley, *supra* note 8, at 1503.

<sup>14</sup> See *id.* at 1508.

industries like IT can capture not just the value of the inventive contribution that they have made—something they ought to be entitled to—but also some greater amount of money than their invention is worth.<sup>15</sup>

What are those specific features that facilitate holdup? Insufficient discounting in damages is one.<sup>16</sup> If a patent suit goes to court, the plaintiff may take the patent and, for example, the Intel microprocessor to the jury and say, “You know, they make billions of dollars on this microprocessor. I have a circuit that is used in this microprocessor and all I want is 1%. How can that be unreasonable to ask?” 1% is indeed reasonable in a lot of circumstances. It may not be reasonable, though, if there really are 5000 different inventions bundled together in the microprocessor that Intel sells, because if Intel has to pay 1% 5000 times, it will find it hard to make a profit on its microprocessor.

Time and time again, we have seen this sort of royalty-stacking problem arise.<sup>17</sup> One great example is 3G telecom in Europe.<sup>18</sup> The standard-setting organization (the “SSO”) put out a call for essential patents, asking which they must license to make the 3G wireless protocol work and the price at which the patent owners would license their rights.<sup>19</sup> 3G telecom received affirmative responses totaling over 6000 “essential” patents and the cumulative royalty rate turned out to be 130%.<sup>20</sup> This is not a formula for a successful product.

Part of the problem that leads to royalty stacking is that the law doesn’t adequately take account of the fact that there are other inventions out there. The other patent-protected components of the defendant’s product don’t show up in court, at least not in a useful way. None of the parties involved, including the court, want to try a bunch of collateral patent suits. Intel has no motivation to admit that there are other patents out there that it might have licensed or might be infringing. The patentee obviously does not want to bring up the

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<sup>15</sup> I do not attempt to define the optimal royalty price here. For a definition that measures the incremental contribution of the technology, factors in the likelihood that the patent covering that technology is valid and infringed, and factors in the parties’ bargaining power, see Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, TEX. L. REV. (forthcoming 2007) (manuscript at 5–6, available at <http://faculty.haas.berkeley.edu/shapiro/stacking.pdf>).

<sup>16</sup> See *id.* at 22–25.

<sup>17</sup> See *id.* at 25–28 (providing a detailed discussion of royalty stacking and additional examples).

<sup>18</sup> Michael R. Franzinger, *Latent Dangers in a Patent Pool: The European Commission’s Approval of the 3G Wireless Technology Licensing Agreements*, 91 CAL. L. REV. 1693, 1702 (2003).

<sup>19</sup> See *id.*

<sup>20</sup> See Lemley & Shapiro, *supra* note 15, at 26.

number of other patents that contributed to the success of the invention. The judge already has had to deal with one complex patent issue and doesn't want to further complicate the case with collateral issues. So we get royalty rates in court, and therefore royalty rates in license deals, that are substantially greater than the actual inventive contribution of the particular patent.<sup>21</sup>

Further, patentees are not limited to their actual damages or a reasonable royalty if they can prove that the defendant is a willful infringer. If the patentee demonstrates willful infringement, he can get three times his actual damages. Trebling damages is a perfectly reasonable rule in the abstract until we realize that 92% of all patent suits involve claims of willful infringement.<sup>22</sup> Willfulness claims are so common because the legal rules we have created in the United States to define a willful infringer do not require a person to act willfully, or even to have any state of mind whatsoever at the time he adopts his product. Indeed, many of the people accused of willful infringement had never heard of the patentee or the patent at the time that they adopted their products.<sup>23</sup>

Even more significant than royalty stacking, the threat of injunctive relief allows a patent owner to capture a substantially greater share of a component invention in a settlement than it otherwise could have, because if the patent is found valid and infringed, the injunction will generally be effective immediately.<sup>24</sup> If all a patent owner got was an injunction that said the next time Intel designs a chip, it must take the patent owner's circuit out, the injunction wouldn't have any holdup effect. But, in fact, the patentee can get an injunction that effectively says that Intel, because it included this circuit in its microprocessor, has to stop selling that microprocessor immediately. And it can only start selling again after it redesigns its product, something that may take years and cost billions of dollars. The negotiation value associated with that threat of injunctive relief is quite substantial.<sup>25</sup> It regularly leads patent defendants to settle their cases by paying more money than they would have had to pay in damages and a going-

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<sup>21</sup> See *id.*

<sup>22</sup> Kimberly A. Moore, *Empirical Statistics on Willful Patent Infringement*, 14 FED. CIR. B.J. 227, 232 (2004).

<sup>23</sup> Mark A. Lemley & Ragesh K. Tangri, *Ending Patent Law's Willfulness Game*, 18 BERKELEY TECH. L.J. 1085, 1092 (2003).

<sup>24</sup> See Lemley & Shapiro, *supra* note 15, at 13-14.

<sup>25</sup> See *id.*

forward royalty had they gone to trial and lost the case.<sup>26</sup> The only explanation for this result is that patent defendants are paying to avoid not the threat that they will have to design around the invention, but the threat that the integrated product (including the unpatented components) will be enjoined in the meantime.

What unifies all of these holdup problems is the presence of irreversible investments by defendants in the industry. If Intel builds a semiconductor fabrication plant, designs a line of products, builds a system architecture, and opens it so that other companies can make compatible products, it cannot get that investment back. Even if Intel could quite easily have avoided infringing the patent if the company had been aware of it before making the decision to choose this technology, Intel still faces an injunction that will impose disproportionate costs because of its irreversible investment. These irreversible investments drive the licensing settlement value to a percentage that is much greater than it would be in a system in which we calculated the value that the inventor had actually contributed to the product.<sup>27</sup>

Standard setting makes the holdup problem worse because it leads to the creation of irreversible investments.<sup>28</sup> Standard setting, almost by definition, involves a group of people agreeing that they will invest in a particular technology and forego investment in another technology.<sup>29</sup> They may not affirmatively agree to sell only standardized products, but as a practical matter there is a reason they are spending time and money to participate in setting this standard: they want to use the resulting standard. Thus, if a patent owner shows up in the standard-setting process after the irreversible investment is made, the investments have been made not just by one manufacturer but by everyone in the industry. The risk in the standard-setting context, then, is that patent owners can demand sums of money that are far out of proportion to the actual inventive contribution that they have made.<sup>30</sup> Patents covering industry standards are, therefore, thir-

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<sup>26</sup> See *id.*

<sup>27</sup> See *id.* at 14–18. Irreversible investments are not the only thing contributing to this problem, as the Lemley-Shapiro analysis demonstrates, but they make it worse. See *id.*

<sup>28</sup> Marc Rysman & Tim S. Simcoe, *Patents and the Performance of Voluntary Standard Setting Organizations 2* (NET Inst., Working Paper No. 05-22, 2005), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=851245](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=851245).

<sup>29</sup> See Mark A. Lemley, *Intellectual Property Rights and Standard-Setting Organizations*, 90 CAL. L. REV. 1889, 1893 (2002).

<sup>30</sup> See *id.*

teen times more likely to be litigated than comparable patents that do not cover a standard.<sup>31</sup>

There is a cottage industry associated with suing people in the IT sector for patent infringement in circumstances in which the patentee can demand a share of the profits significantly in excess of its inventive contribution. It is the business model of the new millennium. Engaging in holdup does not make these patent owners evil, necessarily; it makes them capitalists. We have designed a legal system that gives them this opportunity. They are entrepreneurs, if you will, but they are entrepreneurs taking advantage of a system that is already deeply flawed.

## II. SOLUTIONS

In the balance of this Article, I consider how we might fix this flawed system. I think we must tackle the problem of patent holdup not by identifying and punishing particular persons as patent trolls, but by getting at the root causes of holdup. Our goal should be to create a world in which patent owners can get paid for the technology they contribute, but in which what they get paid bears some reasonable resemblance to what they actually contributed.

So, here are ten things we might do to achieve this goal. Not surprisingly, none of these have been developed in detail. Some of them may be half-baked. They might even all be half-baked. They are, if I have calculated correctly, listed in increasing order of controversy, and divided into two sections. The first five solutions in Section A are things that private organizations, in particular SSOs, can do.<sup>32</sup> The last five in Section B are things the law can do.<sup>33</sup>

### A. Things SSOs Can Do

First, what might SSOs do, assuming for a moment that the law permits them to act? As I discuss below, SSOs could get members to agree in advance of the standard to license patent rights on reasonable and nondiscriminatory (“RAND”) terms, bind SSO members to that RAND policy by license agreements, require patentees to specify the content of their RAND licenses *ex ante*, impose penalty defaults to force disclosure, and/or establish a step-down royalty rate proce-

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<sup>31</sup> See Timothy S. Simcoe, Explaining the Increase in Intellectual Property Disclosure 4 (tbl.3 (Dec. 8, 2005) (unpublished manuscript, on file with author).

<sup>32</sup> See *infra* notes 35–56 and accompanying text.

<sup>33</sup> See *infra* notes 57–87 and accompanying text.



ture. I defer until a later section the question of whether these ideas raise antitrust concerns.<sup>34</sup>

### 1. RAND Licensing

Most obviously, SSOs can, and many do, impose obligations on their members to license patents to others on RAND terms.<sup>35</sup> SSOs could impose a royalty-free licensing obligation under which members must give up their patents, or at least those essential to the adopted standard. Some organizations do this, but I don't think it is generally a good idea.<sup>36</sup> I think there are limited circumstances in which royalty-free licensing is appropriate, specifically where a software consortium is working in open source, because there may be no other way to avoid patents covering open source software. But by and large, an SSO that attempts to avoid paying inventors anything for their technology is going too far. Denying all compensation is not fair if the organization is coercing member inventors into it. Worse, once they learn of the policy, potential members who actually have useful innovative technologies will not join such organizations. Beyond that, there are antitrust worries about whether a group of competitors can compel people to forego all royalties for the technology they contribute.<sup>37</sup>

By contrast, I think it is less problematic to get members to agree in advance of knowing what the standard is going to be—and therefore who owns rights in the standard—that whoever does own those rights will license on RAND terms. Not only is it legal, it's a good idea. Both issued patents and pending patent applications should be subject to this RAND licensing obligation.<sup>38</sup>

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<sup>34</sup> See *infra* notes 57–60, 88–93 and accompanying text.

<sup>35</sup> See Lemley, *supra* note 29, at 1904–05 (discussing the results of an empirical study of SSO IP policies).

<sup>36</sup> See *id.*

<sup>37</sup> See *id.* at 1943–47 (providing an in-depth discussion of potential antitrust issues raised by SSOs, especially royalty-free structures).

<sup>38</sup> Some have objected to forcing disclosure of unpublished patent applications. See generally David J. Teece & Edward F. Sherry, *Standards Setting and Antitrust*, 87 MINN. L. REV. 1913 (2003). Patent owners, however, can pre-commit to licensing those applications without necessarily having to disclose them. And not including unpublished applications will leave a gaping hole in the RAND rule, because evidence shows that many companies later patent the standards of SSOs whose meetings they attend. See Neil Gandal et al., *Intellectual Property and Standardization Committee Participation in the U.S. Modem Industry* 14–15 (Ctr. for Econ. Policy Research, Discussion Paper No. 4658, 2004), available at <http://ideas.repec.org/p/cpr/ceprdp/4658.html>.

Some, but not all, SSOs—the majority in the study that I did in 2002—actually do this.<sup>39</sup> Others believe it's enough to have disclosure. I think that is a mistake. If an SSO has a policy that requires members to disclose their IP rights, but imposes no commitment to license, nor gives any indication of what the royalty will be when someone does license, its members may learn things they didn't really want to know. Suppose the disclosure obligation works, and that people tell the SSO about all of their patents. Indeed, because there is no cost to doing so, patent holders might even over-disclose. I.B.M. might disclose a couple hundred patents that might relate to a technology without telling the SSO how much it would license them for or even if it will license them at all.<sup>40</sup> Now what does the SSO do? The organization has not solved the holdup problem unless it can get people to commit in advance that they will license their patents rather than use the threat of injunction to hold the SSO up. Worse, the SSO is now on notice of the existence of the patents and so, if it adopts the technology, its members will be willful infringers.<sup>41</sup>

## 2. License Agreement

Second, and directly related to the first solution, SSOs should bind members to follow the RAND policy. They can do this by making member duties clear, rather than just including an obligation somewhere in the by-laws and assuming members ought to be aware of it. It should be crystal clear to members that when they join the organization, and when they sign the certification that they are willing to license their patents on RAND terms, they have actually entered into a license agreement, not merely made a vague promise to negotiate a deal sometime later.

If members bind themselves to a license for essential SSO patents, they have licensed away their right to exclusivity, and the only questions that remain are the precise terms of that license, such as the

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<sup>39</sup> See Lemley, *supra* note 29, at 1904–05. Bob Skitol would go further, arguing that SSOs have a legal obligation to compel RAND licensing. See Robert A. Skitol, *Concerted Buying Power: Its Potential for Addressing the Patent Holdup Problem in Standard Setting*, 72 ANTI-TRUST L.J. 727, 729 (2005). I am not persuaded that SSOs are required to do this, though I agree that it is a good idea.

<sup>40</sup> See Simcoe, *supra* note 31, at 10 (“Half of all [IP rights] disclosures fail to identify a specific patent or patent application, and ninety percent do not provide information about pricing.”).

<sup>41</sup> See Lemley, *supra* note 29, at 1960–62 (addressing further the problems with a disclosure-only policy).

royalty percentage.<sup>42</sup> This is important because it takes the threat of injunctive relief off the table.<sup>43</sup> Then, if the parties cannot come to agreement, the only question for a court to decide is: Was there a breach of the contract and what are the damages for breach? The patentee has foregone the opportunity to sue for patent infringement and to seek injunctive relief and treble damages.

### 3. Ex Ante RAND

A license pre-commitment gets us only part of the way to avoiding holdup because we still don't know what the royalty rate will be. If the number turns out to be a 25% running royalty, a technology that looked cost-effective when adopted may turn out not to be. So my third solution is to require patentees to specify the content of their RAND licenses ex ante.<sup>44</sup> We want members to know what they are getting into in as much detail as possible. SSOs hate this because they are largely composed of technologists who just want to get on with the business of choosing a technical standard and don't want to be bothered with how much it is going to cost in the long run.<sup>45</sup> But their employers are going to be bothered, and they are much better off being bothered ex ante rather than ex post. SSOs need to find out what the true cost of a standard is before they adopt it, not after the fact.<sup>46</sup>

At a minimum, even if SSOs are not willing to go through the license negotiations that would be required in every case, they need to set up an internal arbitration or discussion procedure so the group members can figure out the cost of alternative standards while there are still competitive alternatives.<sup>47</sup> Then, if the price turns out to be too high, the standards organization can still decide it is going to adopt one

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<sup>42</sup> See Joseph Scott Miller, *Standard Setting, Patents, and Access Lock-In: RAND Licensing and the Theory of the Firm*, 40 IND. L. REV. (forthcoming 2006).

<sup>43</sup> Or, at least it *should* take injunctive relief off the table. See Lemley, *supra* note 29, at 1964-67, and Miller, *supra* note 42, for further discussion.

<sup>44</sup> See Gil Ohana et al., *Disclosure and Negotiation of Licensing Terms Prior to Adoption of Industry Standards: Preventing Another Patent Ambush?*, 2003 EUR. COMP. L. REV. 644, 646 (2003); Skitol, *supra* note 39, at 729, 733-35.

<sup>45</sup> See Lemley, *supra* note 29, at 1904-05.

<sup>46</sup> Although ignoring the problem will sometimes make it go away, because not all patentees will enforce their patents, Tim Simcoe has shown that patents disclosed to SSOs are thirteen times more likely to be litigated than ordinary patents. See Simcoe, *supra* note 31, at 4 tbl.3.

<sup>47</sup> For a suggestion of how to model a reasonable royalty in the standard-setting context, see generally Daniel G. Swanson & William J. Baumol, *Reasonable and Nondiscriminatory (RAND) Royalties, Standards Selection, and Control of Market Power*, 73 ANTITRUST L.J. 1 (2005).

of those alternatives, rather than making irreversible investments in a particular standard without knowing how much it will ultimately cost.

#### 4. Penalty Defaults

Fourth, SSOs might want to consider imposing penalty defaults. These are default rules that effectively force disclosure of nonstandard terms by setting a harsh term in the absence of disclosure.<sup>48</sup> Imagine an SSO by-law that said, "The maximum license fee on any patent is \$1000 unless the patentee identifies the patent and the rate it proposes to charge." If a patentee is not willing to come out and say she really cares about this patent and is going to insist on a 2% royalty, then she gets the small default fee. For many patentees, that default fee is probably sufficient. But if some patentees really want to negotiate a higher rate, a penalty default will draw them out and make them tell the SSO what the royalty is going to cost before the organization chooses the standard.

Penalty defaults may also solve the problems inherent in SSO patent-disclosure rules. Disclosure rules are problematic because they generally don't require corporate representatives to search their patent files, and rarely make it clear whether only essential patents are covered, much less what makes a patent essential or important. With a RAND rule coupled with a penalty default, an SSO doesn't need a separate disclosure obligation. Disclosure will occur naturally for any patent that is likely to matter.

#### 5. Dealing with Aggregation

The final problem SSOs can tackle is that of royalty stacking. Even if an SSO has managed to figure out how much it is really going to cost to license any given patent, it must deal with the multiplicity of underlying patents. Simply adding up the proposed royalty rates won't do, as the 3G wireless example suggests.<sup>49</sup> The problem is one economists call "Cournot complements."<sup>50</sup> Cournot complements means that if two parties hold monopolies on products, each of which must be aggre-

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<sup>48</sup> See Ian Ayres & Robert Gertner, *Filling Gaps in Incomplete Contracts: An Economic Theory of Default Rules*, 99 YALE L.J. 87, 91 (1989) (discussing penalty defaults in contract law more generally).

<sup>49</sup> See Franzinger, *supra* note 18, at 1724–26; Lemley & Shapiro, *supra* note 15, at 25; *supra* notes 18–20 and accompanying text.

<sup>50</sup> Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting*, in INNOVATION POLICY AND THE ECONOMY 119, 133 (Adam B. Jaffe et al. eds., 2001).

gated into a single whole, we cannot rely on market pressure to produce an efficient total price.<sup>51</sup> Rather, unless the sellers can coordinate their pricing, each seller will charge its own supracompetitive price, and the resulting integrated product price will be inefficiently high.<sup>52</sup> If, as commonly occurs in SSOs, there are not two patent owners but ten or twenty or ninety, the problem is correspondingly worse.

Here, I make my most controversial suggestion for SSOs. I believe SSOs should be able to deal with the Cournot complements problem by establishing what we might call a step-down royalty rate procedure that takes account of the prior disclosure of other essential patents. Imagine a rule that said, "We are going to cap the first person who shows up with an essential patent at 5%, and the second person who shows up at 3%, and the third person who shows up at 2%." For subsequent patents, the royalty rate wouldn't go to zero, but would come down to half a percent or a quarter of a percent, on the rationale that the fifth or sixth patent owner who shows up faces licensees who are already making significantly smaller profits because of the presence of the other patentees.<sup>53</sup>

What are the incentives if an SSO uses a step-down royalty? Well, the patent owners now have an incentive to bring their patents in. The SSO has encouraged disclosure of important patents, and members and users of the standard can get a sense of how much the standard will ultimately cost.<sup>54</sup> Best of all, step-down royalties avoid issues like the 130% royalty on the 3G telecom patents, solving the Cournot complements problem by giving the SSO the effective power to coordinate pricing to avoid the holdup problem.<sup>55</sup> When a standard attracts many people who want to assert patents, the value of each additional patent will be discounted by the fact that there are many other claimants. This is as it should be. How much any one patent owner can claim should be a function of how many other patentees the SSO

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<sup>51</sup> See *id.*

<sup>52</sup> See *id.*

<sup>53</sup> Theoretically, the SSO could even go back and require renegotiation with early patent disclosers so that the royalty rate for all patentees dropped as more patent owners entered the scene. Doug Lichtman seems to have something like this in mind. See Douglas Lichtman, *Patent Holdouts and the Standard Setting Process* 10–11 (Univ. of Chi., Olin Working Paper No. 292, 2006), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=902646](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=902646). But it seems less practical to renegotiate rates with existing licensors, and it also would not have the same disclosure incentives I discuss in the text above.

<sup>54</sup> Someone, perhaps a neutral outsider, would have to distinguish truly "essential" patents from those that are not needed to practice the standard, but whose owners want to get into the royalty stream.

<sup>55</sup> See Lemley & Shapiro, *supra* note 15, at 25–26.

must also satisfy. The measure is imperfect, because the rates are not related to the intrinsic value of the technologies, but the declining rate at least accounts for updated evidence of the total royalty cost. An alternative would be a total royalty pool, with the division of the royalties handled only after all patentees had submitted their claims.

Although a step-down royalty rate would be a logical way of both encouraging disclosure and resolving the Cournot complements problem, it raises antitrust red flags because it involves buyers in the technology market collectively setting a maximum price they will pay for IP rights.<sup>56</sup> This is especially true if the SSO sets a total royalty cap rather than just a declining rate. The concept of the step-down royalty is a good one as an economic matter, but antitrust law would be right to worry that SSOs that see their members as mostly buyers rather than sellers of IP rights will set a total royalty rate that is artificially low. Therefore, organizations may not want to adopt such a proposal without some reassurance from the antitrust agencies that doing so is legal.

### B. Things the Law Can Do

Second, what might the law do to deal with patent holdup? As discussed below, the law can have antitrust get out of the way of SSO attempts to find the true costs of standards and allow discussion of royalty rates before a standard is set, limit abuse of continuation practice, make it harder to claim willful infringement in court, have courts consider all of the patent contributors to a standard in awarding damages, and limit injunctive relief.

#### 1. Antitrust Law Help for Participants in SSOs

The first thing the law can do flows from the above discussions of SSO behavior. Antitrust law ought to get out of the way of a number of mechanisms discussed in Section A that permit SSOs to find out the true cost of a standard and encourage licensing negotiations over essential patents. Specifically, the law ought to permit SSO members the latitude to discuss royalty rates collectively before the standard is set. Antitrust law should even allow SSOs to impose a step-down royalty scheme, so long as there is not a hard cap such that the SSO won't pay more than X dollars, regardless of how many patents are out there.

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<sup>56</sup> See Lemley, *supra* note 29, at 1943–47 (providing greater discussion of the antitrust issues involved).

Now, antitrust law is justifiably nervous about people in an industry getting together to talk about price. But in this context, the parties are going to have to have these conversations individually or collectively anyway. I think it is far better to have these conversations *ex ante*, before the group adopts the standard. The only way to plausibly accomplish this is to do it within the context of the SSO. I note in this respect that paragraph 225 of the European Commission's licensing guidelines, quite wisely, affirmatively permits the negotiation of royalty rates in SSOs before the standard is set.<sup>57</sup> And Deborah Platt Majoras, the Chairman of the Federal Trade Commission, has suggested that the government is unlikely to pursue antitrust claims against SSOs that discuss price, though she made it clear that any such acts are subject to rule of reason scrutiny.<sup>58</sup>

This does not mean that antitrust law should impose no limits on such negotiations. We don't want the SSO acting as a monolithic block to try to artificially drive down the price that patent owners can charge.<sup>59</sup> One solution to this potential problem is to say that SSOs can impose such restrictions only with respect to other members of the group. SSOs should not be able to negotiate collectively with respect to outsiders, because then they really are going to have a concrete set of interests: they know they represent only potential defendants and that the outsider is a potential plaintiff. Further, such negotiations should only be permitted before or simultaneously with discussions about the technical merits of the standard, before the parties know what the standard is and therefore before they know for sure who is actually going to be the owner and who is going to be the licensee. Both of those limits reduce the risk of buyers' cartel behavior—SSO decisions that artificially diminish the royalty charged.<sup>60</sup>

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<sup>57</sup> Commission Notice, Guidelines on the Application of Article 81 of the EC Treaty to Technology Transfer Agreements, ¶ 225, 2004 O.J. (C 101) 2, available at [http://europa.eu.int/eur-lex/pr/en/obj/dat/2004/c\\_101/c\\_10120040427en00020042.pdf](http://europa.eu.int/eur-lex/pr/en/obj/dat/2004/c_101/c_10120040427en00020042.pdf).

<sup>58</sup> Deborah Platt Majoras, Chairman, Fed. Trade Comm'n, Remarks at Stanford University: Recognizing the Procompetitive Potential of Royalty Discussions in Standard Setting (Sept. 23, 2005), available at <http://www.ftc.gov/speeches/majoras/050923stanford.pdf>.

<sup>59</sup> *But see* Skitol, *supra* note 39, at 735–39 (seeming to endorse just such a result).

<sup>60</sup> *Cf.* Polk Bros. v. Forest City Enters., 776 F.2d 185, 191 (7th Cir. 1985) (drawing a similar distinction in joint ventures between restraints entered into contemporaneously with the creation of the venture and those created afterwards).

## 2. Limit Abuse of Continuation Practice

The remaining four solutions are not specific to SSOs, but involve reform of the patent law. All of the proposals I've offered so far will help, but they will work only for the subset of patent holdup problems that affect group-adopted industry standards, and only for the subset of patent owners that belong to SSOs already. They will not deal with problems created by the outsider, the person who decides to sit and wait and then brings his patents to bear. Solutions two through five are directed at these problems.

My second suggestion is to limit abuse of continuation practice in the U.S. patent system. To an outsider, one of the oddities of the U.S. patent system is that it is impossible for the PTO ever to finally reject a patent application.<sup>61</sup> Patent applicants whose claims are rejected can come back to the PTO an unlimited number of times to try to persuade it to grant them a patent. Even if an applicant persuades the PTO to grant a patent, she may still come back and ask for better or broader claims.<sup>62</sup> Now, I would not have thought, frankly, that restricting this practice was one of my more controversial proposals. There seem to be few good justifications for continuation practice. But there are a lot of people in the patent bar deeply committed to it. Some patent owners are committed because they get to use continuations to game the system. These owners wait and see what standards get adopted by SSOs and then redraft their patent claims around those standards. This is a particular problem in the IT sector because technology changes rapidly and unscrupulous patentees can use continuation practice to draft patent claims to cover things they had not thought of.

Other patent owners may support continuations for other reasons. For instance, they may be worried about shifts in technology. In the peculiar context of the pharmaceutical industry, there is minimal cost to using continuations, since the drug is unlikely to receive Food and Drug Administration approval for a substantial period of time anyway. But, even if there are reasons to retain them in some circumstances, limiting or eliminating abuse of continuations would help solve the broader holdup problem.

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<sup>61</sup> For a detailed discussion of abuse of continuations and how to solve it, see Mark A. Lemley & Kimberly A. Moore, *Ending Abuse of Patent Continuations*, 82 B.U. L. REV. 63, 93 (2004).

<sup>62</sup> See *id.* at 76.



The initial draft of H.R. 2795, the Patent Reform Bill introduced in the U.S. House of Representatives in 2005, would have expressly granted the PTO the power to limit continuation practice.<sup>63</sup> Although that provision is no longer in the current bill before Congress, the PTO itself has issued a Notice of Proposed Rulemaking that would limit applicants to one continuation as a matter of right, and permit further continuations only if the applicant could show a special need.<sup>64</sup> Although this new rule would not eliminate abuse of continuations, if implemented it will be an important step towards curbing patent holdup.

### 3. Limiting Willfulness

My third suggestion is to make it harder to claim willfulness in patent law. We all have an intuitive understanding as laypeople of what it means to act willfully: to do something intentionally, knowing the consequences. Patent law's legal standard for willfulness bears no resemblance to that lay understanding of the term "willfulness." We should change the law so it does bear such a resemblance. We could limit willfulness to cases in which a defendant actually copied from the inventor, or at least cases in which the defendant knew of the existence of the patents when it adopted a technology.<sup>65</sup> Right now, willfulness is mostly used in circumstances where the technology has been in existence for four or five years before the patent owner sends a letter to the developer alleging infringement.<sup>66</sup> Suddenly, a company that independently developed the technology becomes a willful infringer, and potentially liable for treble damages. The result is another way that a patent owner can hold up an independent developer.

Alternatively, we could do what H.R. 2795 does.<sup>67</sup> H.R. 2795 keeps a broad definition of willfulness, but makes it much harder to prove in court.<sup>68</sup> It would prevent plaintiffs from even alleging willfulness until they've actually demonstrated infringement at trial, and

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<sup>63</sup> H.R. 2795, 109th Cong. (2005).

<sup>64</sup> Changes to Practice for Continuing Applications, Requests for Continued Examination Price, and Applications Containing Patentably Indistinct Claims, 71 Fed. Reg. 48-01 (proposed Jan. 3, 2006).

<sup>65</sup> See Lemley & Tangri, *supra* note 23, at 1116-21.

<sup>66</sup> See Moore, *supra* note 22, at 7. Moore found that virtually all patent owners claim willful infringement, even though in many—perhaps most—cases, there is no claim that the defendant actually copied the technology from the plaintiff. *Id.*

<sup>67</sup> H.R. 2795.

<sup>68</sup> See *id.*

would therefore change somewhat the dynamics of settlements made in the shadow of willfulness.<sup>69</sup> At a minimum, we could prohibit a finding of willfulness on the part of SSO members unless they receive notice of the patent prior to the adoption of the standard.<sup>70</sup>

Such an approach might work best if coupled with some sort of registry or public disclosure of new standards, so that non-members of the SSO could learn of the standard and submit their patents.<sup>71</sup> If members were not aware of the patent—if they made an investment decision not having any idea the patent is out there—then it is hard to call them willful infringers. This doesn't mean that the SSO members aren't infringers if they use the standard, and it doesn't mean they won't be liable for damages. It would mean, however, that SSO members couldn't be found to be willfully infringing in adopting a standard so long as they tried to find out whether anyone had patents covering the standard. This, too, would encourage disclosure of essential patents, since patent owners who wanted to enforce their rights would also want to preserve their ability to seek treble damages.

#### 4. Reasonable Royalty Rates and Damages Calculations

My fourth suggestion is that we fix the problem of definitions and proof in reasonable royalties and damages calculation. Carl Shapiro and I are studying the damages rules in royalty-stacking cases right now.<sup>72</sup> For a variety of reasons, the royalty rates that courts actually award are surprisingly high to most people who negotiate royalties.<sup>73</sup> The average royalty rate in a single-patent "reasonable royalty" damages case is around 13%.<sup>74</sup> It varies a little by industry, but not as much as might be expected. In the IT industry, the average royalty rate is 7%, which is still much greater than what license negotiators in the field believe is the benchmark.<sup>75</sup> Furthermore, damage royalties drop a little for component inventions, but, again, not much.<sup>76</sup> If the patent is one of several components that have to be aggregated to-

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<sup>69</sup> See *id.*

<sup>70</sup> Rep. Zoe Lofgren has circulated proposed legislation along these lines, though she has not introduced it.

<sup>71</sup> I am indebted to David McGowan for this idea.

<sup>72</sup> See Lemley & Shapiro, *supra* note 15, at 14.

<sup>73</sup> See *id.* at 21–25 (describing these factors in detail).

<sup>74</sup> *Id.* at 30 tbl.1.

<sup>75</sup> See *id.* at 30–31.

<sup>76</sup> See *id.* at 30.

gether, the court-ordered royalty drops by about 30%.<sup>77</sup> This is less than we would expect it to drop if there were only two components in each component industry technology.<sup>78</sup>

In short, the data suggest that courts don't calculate damages taking full account of the contributions that other people besides the patent owner have made to a defendant's product.<sup>79</sup> But they could. H.R. 2795 once again takes steps in this direction, requiring that a patent owner seeking damages based on the sale of a multi-component invention demonstrate that the royalty is attributable to the patentee's inventive contribution, as distinguished from all the other aspects of the product being sold.<sup>80</sup> That requirement would help alleviate some of the holdup problem by reducing patent royalty rates in litigation, and therefore in licensing, to something approximating what it is that the patentee actually contributes.

## 5. Redefining Injunctive Relief

My final idea is one that has been overtaken by events: I think we ought to take seriously what the patent statute actually says about injunctive relief. The patent statute says that courts "may" grant injunctions "in accordance with principles of equity on such circumstances as they deem reasonable."<sup>81</sup> The U.S. Court of Appeals for the Federal Circuit, by contrast, had adopted a rule that district courts must grant injunctions regardless of the principles of equity, with one possible exception—public health—that is not applicable to most of the IT industry.<sup>82</sup> Under that Federal Circuit rule, if you won a patent suit, you got an injunction. In my speech at the Owing Standards Symposium at Boston College in March 2006, I suggested this rule should change. And change it did.

The U.S. Supreme Court reversed the Federal Circuit rule in 2006 in *eBay, Inc. v. MercExchange, L.L.C.*, holding that it contravened the patent code.<sup>83</sup> The Court gave district courts the power to consider traditional principles of equity in deciding whether to grant injunctive

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<sup>77</sup> See Lemley & Shapiro, *supra* note 15, at 30–31.

<sup>78</sup> See *id.*

<sup>79</sup> See *id.*

<sup>80</sup> H.R. 2795, 109th Cong. (2005).

<sup>81</sup> 35 U.S.C. § 283 (2000).

<sup>82</sup> *MercExchange, L.L.C. v. eBay, Inc.*, 401 F.3d 1323, 1339 (Fed. Cir. 2005), *rev'd*, 126 S. Ct. 1837 (2006).

<sup>83</sup> See 126 S. Ct. 1837, 1841 (2006).

relief.<sup>84</sup> Courts can now consider the public interest, the balance of the hardships, and whether the patentee really needed injunctive relief or was merely using the threat of injunction to leverage its bargaining power.<sup>85</sup> There are some early indications that district courts are taking this responsibility seriously, denying injunctive relief where non-manufacturing patent owners seek it primarily to use as a bargaining lever.<sup>86</sup> Denying such relief is the most powerful way to prevent patent holdup and realign the incentives in patent licensing negotiations.<sup>87</sup> Applying equitable principles doesn't mean eliminating patent injunctions. My guess is that the majority of infringement findings will still result in injunctive relief because the patentee is actually using the patent to exclude a competitor. But courts will be empowered in cases of holdup to remove the threat that induces defendants to settle for royalties far in excess of the patentee's actual contribution.

### C. Antitrust Law Can't Solve the Holdup Problem

Note what is not on this list: antitrust law. I have made ten more or less radical proposals for doing something about patent holdup, and not one of them mentions antitrust, except to say antitrust law should get out of the way of SSOs. That's not an accident. I think antitrust law serves a valuable purpose, but where the holdup problem is concerned, it is a backstop. In this particular circumstance, it's a backstop that's going to apply only if private efforts in SSOs and IP law have already failed us.

Even then, it is not clear that antitrust law is up to the task of policing patent holdup.<sup>88</sup> Courts may be reluctant to second-guess what they see as the judgment of patent law to give certain rights to patent owners.<sup>89</sup> Certainly, some courts have shown undue deference to patents even in circumstances that more clearly violate the antitrust laws.<sup>90</sup> Further, proving an antitrust violation requires detailed evi-

<sup>84</sup> See *id.*

<sup>85</sup> See *id.*

<sup>86</sup> See *24 Techs. v. Microsoft Corp.*, 434 F. Supp. 2d 437, 443–45 (E.D. Tex. 2006).

<sup>87</sup> For an economic demonstration of this, see Lemley & Shapiro, *supra* note 15, at 32–34.

<sup>88</sup> See Herbert Hovenkamp, *Standards Ownership and Competition Policy*, 48 B.C. L. REV. 87, 104–06 (2007).

<sup>89</sup> See generally *In re Tamoxifen Citrate Antitrust Litig.*, No. 03-7641, 2006 WL 2401244 (2d Cir. Aug. 10, 2006).

<sup>90</sup> See generally *id.*; *FTC v. Schering-Plough Corp.*, 402 F.3d 1056 (11th Cir. 2005). For a detailed discussion of these cases and their problems, see HOVENKAMP ET AL., *supra* note 6, § 7.4e2, at 7-36.

dence of both causation and intent, something that may be difficult even when, as a policy matter, a patentee should not be permitted to extend its rights.<sup>91</sup> We have yet to see a successful contested prosecution of standard-setting abuse.<sup>92</sup> Antitrust law can play a role here in extreme cases, such as in *In re Rambus, Inc.*<sup>93</sup> But if we design the patent law and the SSO rules correctly, those cases should not arise.

### CONCLUSION

Patents provide needed incentives. But in certain circumstances, they can give a patentee too much power to restrict an integrated product on the basis of a patent covering a minor component of that product. That fact, coupled with unscrupulous behavior of some patentees, creates serious problems in the IT industry in general and SSOs in particular. Patent law should seek to realign incentives so that the value any given patentee can capture bears a reasonable relationship to the contribution its invention makes. SSOs should be diligent in finding out what patents exist and what it will cost to license them. And antitrust law should facilitate rather than interfere with this process. If we can accomplish these changes, we can ensure that patent law serves its proper role in encouraging rather than stifling innovation.

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<sup>91</sup> See HOVENKAMP ET AL., *supra* note 6, § 35.5b, at 35-47.

<sup>92</sup> We did see a consent decree in *In re Dell Computer Corp.*, and we saw some temporary successes overturned on appeal or still ongoing. 121 F.T.C. 616, 625-26 (1996); *see, e.g.*, *Rambus, Inc. v. Infineon Techs. AG*, 318 F.3d 1081, 1106 (Fed. Cir. 2003) (overturning a district court judgment of fraud against Rambus); *In re Union Oil Co. of Cal. (Unocal)*, No. 9305, 2004 WL 1632816, pt. VIII (F.T.C. July 7, 2004) (reversing administrative law judge's decision to dismiss antitrust claim against Unocal, and remanding for trial before the administrative law judge); *In re Rambus, Inc. (Rambus I)*, No. 9302, 2004 WL 390647, pt. IV (F.T.C. Feb. 24, 2004) (administrative law judge opinion rejecting the FTC's antitrust claims against Rambus), *overturned by In re Rambus, Inc. (Rambus II)*, No. 9302, 2006 WL 2330119 (F.T.C. Aug. 2, 2006). The *Unocal* case was settled when Unocal agreed to dedicate the patents in question to the public as a condition of its merger with Chevron. *See Hovenkamp, supra* note 88, at 108 n.96.

<sup>93</sup> *See Rambus II*, 2006 WL 2330119, at pt. V.