

## OVER-REWARDING PATENTING: YOU GET WHAT YOU PAY FOR

DOUGLAS MELAMED\*

Patents are intended to create incentives for innovation and invention.<sup>1</sup> Whether they serve that purpose depends not only on how and under what circumstances patents are issued, but also on how and to what extent they are protected. Sound patent policy thus depends not only on the articulation of the boundaries of the patents, but also on the remedies that are provided when patents are infringed. If the remedies are inadequate, patents will provide insufficient incentives for invention. Remedies are inadequate if they do not prevent infringement when infringement is undesirable or do not provide sufficient compensation for patent holders when infringement does occur.

Assume patent holder P invents a new process for making widgets that is worth one dollar per widget more than the next best alternative (perhaps because it reduces per-unit manufacturing costs for widgets by one dollar). Assume further that, for any of a number of reasons including P's decision to license all manufacturers or equitable considerations that make it inappropriate to preclude manufacturer M from using the technology, the law permits M to use the patented technology as long as M pays an appropriate royalty. On these assumptions, a royalty in excess of one dollar per widget would require M to pay more to use the patented technology than the technology is worth and more than M would agree to pay in a market transaction in which both P and M were free to walk away from the

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\* Professor of the Practice of Law, Stanford Law School. This Essay was adapted from remarks given at the 2015 Federalist Society National Student Symposium held at the University of Chicago.

1. This instrumental purpose of patents is stated explicitly in Art. I, section 8, clause 8 of the U.S. Constitution, which grants Congress the authority: "To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries." U.S. CONST. art. I, § 8, cl. 8.

deal. One dollar per widget is thus the maximum royalty that could be regarded as appropriate. Anything in excess of that amount would pay P more than the invention is worth. While the excess remedy might create additional incentives for invention, the incentives would be inefficient because inventions that depend on such excess remedies would be worth less than their cost to technology users.

In fact, a royalty less than one dollar per widget might well be adequate. For one thing, P might have been unable to obtain that much in a negotiated deal with M. If, for example, M has an alternative to P's technology that is worth one dollar less and P has no way to replace M's royalties, both P and M stand to lose one dollar if they fail to reach an agreement and M chooses the non-infringing alternative. In that event, the parties would likely agree on a royalty of less than one dollar per widget, even assuming that there is no uncertainty about validity or infringement. In addition, if, as recent studies suggest, patent protection is not necessary to induce invention in many circumstances,<sup>2</sup> a damage remedy that paid P less than the full value of the invention to M would leave P with sufficient incentives to invent. These complications are ignored in the discussion below.

A damages remedy or required royalty of more than one dollar per widget would make the cost of widgets higher than if the alternative process were used. The patented technology would reduce manufacturing cost by one dollar, but that savings would be more than offset by the royalty payment. The increased cost of the widgets would presumably increase the price of the widgets and thus reduce output of widgets. By increasing the cost of using the patented technology, the remedy would also tax and thus deter follow-on inventions. In short, excessive remedies for patent infringement not only overcompensate patent holders, but also reduce both product output and invention itself. Excessive infringement remedies thus directly undermine the purpose of the patent system to promote invention.

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2. Cf. Mark A. Lemley, *Faith-Based Intellectual Property*, 63 UCLA L. REV. (forthcoming 2015) (describing an "outpouring of sophisticated empirical work" showing that the relationship between patents and innovation is "complicated" and "ambiguous" and differs among industries); Michele Boldrin & David K. Levine, *The Case Against Patents*, 27 J. ECON. PERSP. 3, 5 (2013) (arguing studies show patents do not increase innovation).

## I. REMEDIES FOR PATENT INFRINGEMENT ARE EXCESSIVE

Patent remedy law, sometimes explicitly but often implicitly, is based on an assumed paradigm in which there is a “guilty infringer.” Imagine that Thomas Edison invents the incandescent lightbulb and obtains a patent on the invention. At that point, Edison has three options: (1) he can ignore the patent; (2) he can exploit the patented technology himself and permit no one else to use his invention; or (3) he can license others either selectively or broadly to exploit his technology. If he chooses the licensing option, potential licensees themselves have options: (1) they can take a license; (2) they can try to design around the patent (for example, by inventing a different kind of lightbulb); or (3) they can decide not to invest in lightbulbs. If the patentee chooses to take a license, he or she will be willing to pay no more than, and, as explained above, perhaps less than, the value of the patented technology compared to the next best alternative. If the patent holder insists on more than that, the potential licensee will walk away from the deal. If the parties reach an agreement, the price can be said to be a “market price.”<sup>3</sup> If the parties do not reach an agreement and the potential licensee nevertheless infringes the patent, the infringer can be said to be “guilty” in the sense that it could have obtained a license before infringing (that is, *ex ante*) but infringed without having done so.

This is the paradigm on which patent damages law is based, but there is much in the patent world, especially in the information technology (IT) sector, to which it does not apply. In the IT sector and others, it is generally not realistic or desirable to expect technology users to obtain licenses before using the technology. IT products include technologies claimed by hundreds, sometimes hundreds of thousands, of patents.<sup>4</sup> There is no way that an IT product manufacturer can be expected to

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3. See Brian J. Love, *The Misuse of Reasonable Royalty Damages as a Patent Infringement Deterrent*, 74 MO. L. REV. 909, 920 (2009) (referring to what the parties would have agreed to as the “market value”).

4. See, e.g., Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting*, in 1 INNOVATION POLICY AND THE ECONOMY 119, 125 (Adam B. Jaffe, Josh Lerner & Scott Stern eds., Nat’l Bureau of Econ. Research, 2001) (“[I]n industries such as semiconductors . . . thousands of patents are issued each year and manufacturers can potentially infringe on hundreds of patents with a single product.”).

discover all of the relevant patents (including unpublished patent applications), identify the current patent holders, and negotiate licenses with all of them before practicing the patented technologies.<sup>5</sup> As a policy matter, it would not be desirable for the manufacturer to do so because negotiations consume time and resources and thus delay and impede the commercialization of inventions and follow-on innovation. In the IT world, therefore, firms develop and commercialize new products as fast as they can and worry about patent matters later (that is, *ex post*).<sup>6</sup> One result is ubiquitous simultaneous invention and inadvertent infringement. This is the world of the “innocent infringer.”<sup>7</sup>

Patent remedy law systematically provides excessive remedies to patent holders in cases with innocent infringers. To be sure, remedy law has in principle been based upon the appropriate normative standard. At least since the seminal *Georgia-Pacific Corp. v. United States Plywood Corp.*<sup>8</sup> decision in 1970, royalty damages have generally purported to award the patent holder what a willing licensee would have agreed to pay if he had entered into a license agreement before using the patented technology—in other words, the “market price” of the license.<sup>9</sup> In applying this principle, however, the courts have failed to make the adjustments necessary to reach the intended results in the common case of innocent infringement, in which license

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5. See Love, *supra* note 3, at 929 (explaining that a “patent monitoring” program would be impractical).

6. See Mark A. Lemley, *Ignoring Patents*, 2008 MICH. ST. L. REV. 19, 21 (“[B]oth researchers and companies in component industries simply ignore patents.”).

7. See Mark A. Lemley & A. Douglas Melamed, *Missing the Forest for the Trolls*, 113 COLUM. L. REV. 2117, 2148–49 (2013) (noting ubiquitous simultaneous invention, inadvertent infringement, and rare copying); Love, *supra* note 3, at 940 (“[E]mpirical evidence and the prevalence of near simultaneous invention suggest that truly independent invention, rather than copying, is the norm.”).

8. 318 F. Supp. 1116 (S.D.N.Y. 1970).

9. *Id.* at 1121 (quoting *Faulkner v. Gibbs*, 199 F.2d 635, 639 (9th Cir. 1952) (“The primary inquiry, often complicated by secondary ones, is what the parties would have agreed upon, if both were reasonably trying to reach an agreement.”)); see also Christopher B. Seaman, *Reconsidering the Georgia-Pacific Standard for Reasonable Royalty Patent Damages*, 2010 B.Y.U. L. REV. 1661, 1673 (“Today, nearly all reasonable royalty awards are based on the fifteen-factor test adopted in the district court’s 1970 decision in *Georgia-Pacific Corp. v. United States Plywood Corp.*”).

agreements and reasonable royalty determinations occur after the technology user has infringed the patented technology.<sup>10</sup>

## II. CAUSES OF OVER-REWARDING PATENT HOLDERS

Several factors combine to cause the systematic and substantial over-rewarding of patent holders, each of which is explained in turn.

*First*, an entity whose ongoing business entails infringement of a patent to which it does not have a license no longer has the guilty infringer's option of walking away from the patented technology with a sacrifice of only what was the difference between the value of that technology and the next best alternative *ex ante*. *Ex post*, the innocent infringer has accrued liability for past infringement and thus faces litigation if it does not reach an agreement with the patent holder; the infringer cannot walk away from the deal but rather must negotiate in the shadow of litigation.<sup>11</sup> In addition, *ex post*, the infringer, and often its suppliers and customers as well, will have incurred sunk costs that would have to be replicated if the infringer were to switch to an alternative technology.<sup>12</sup> As a result, the value of the alternative technology to the infringer will have declined relative to the value of the patented technology, and the infringer is to that extent "locked-in" to the patented technology.<sup>13</sup>

*Second*, the alternative to agreement with the patent holder is litigation over both damages for past infringement and the terms on which the innocent infringer may continue to use the patented technology in the future. The central question in the remedy phase of the litigation is how to determine the portion

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10. See Christopher A. Cotropia & Mark A. Lemley, *Copying in Patent Law*, 87 N.C. L. REV. 1421, 1463 (2009) ("We aren't suggesting that damages aren't appropriate for patent infringement—far from it. But deterrence and unjust enrichment are concepts designed to punish and therefore discourage infringement; they have no place in a patent regime where virtually all infringement is unintentional.").

11. See Love, *supra* note 3, at 930 (arguing that parties agree to higher royalties when the agreement is conducted in the "shadow of litigation").

12. See Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 1995–2010 (2007) (arguing that the potential of an injunction can force defendants to agree to excessive settlements because they are already invested in the technology).

13. See *id.*

of the value of the infringing product that is attributable to the patented technology.<sup>14</sup> When the infringing product consists of hundreds or thousands of patented technologies and unpatented components, as well, the litigation process can be expected to overvalue the importance of the patents-in-suit.<sup>15</sup> For one thing, patent trials are often no more than a few days long, and there is no way in such a short time for the contributions of the other components to be fully explored.<sup>16</sup> In addition, a phenomenon that is well-documented in the psychology literature, called the “anchor effect,”<sup>17</sup> means that the fact-finder will overvalue the focus or anchor of the proceeding, which in a patent infringement trial is the patent-in-suit.<sup>18</sup>

*Third*, evidentiary factors for determining patent royalties take into account ex post factors that, as explained above, increase the value of the patents-in-suit relative to the next best alternatives and thus the amount a technology user would pay for a patent license. These factors include the so-called “book of wisdom” doctrine, which explicitly contemplates determining reasonable royalties on the basis of ex post events,<sup>19</sup> and many of the factors set forth in *Georgia-Pacific*, which look to the commercial success of

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14. See Seaman, *supra* note 9, at 1697 (noting one “problem is the difficulty of assessing the patented technology’s value in a complex, high-tech product as compared to other, noninfringing features”).

15. See *id.* at 1698 (“[J]uries often come away from a trial ‘with an inflated sense of the relative value of [the patented] invention’ and consequently award a disproportionately high royalty.”) (citation omitted).

16. See *id.* (“[I]t would be virtually impossible to explain the importance of all the other, noninfringing components and features contained in complex products like computer operating systems or smartphones—such a presentation likely would take weeks or months of highly technical testimony, which few judges would allow (and few jurors would want to endure).”).

17. See, e.g., Nicholas Epley & Thomas Gilovich, *When Effortful Thinking Influences Judgmental Anchoring: Differential Effects of Forewarning and Incentives on Self-generated and Externally Provided Anchors*, 18 J. BEHAV. DEC. MAKING, 199, 200–01 (2005).

18. See Seaman, *supra* note 9, at 1698 (noting that juries hear lots of evidence about the patent in-suit but little about the other component parts and that juries therefore overvalue the patents in suit).

19. See *Sinclair Ref. Co. v. Jenkins Petroleum Process Co.*, 289 U.S. 689, 698 (1933) (calling ex post information a “book of wisdom,” holding that the “courts may not neglect” it because it can be used to correct hypothetical negotiations); see also *Lucent Technologies, Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1333 (Fed. Cir. 2009) (embracing the “book of wisdom” approach); *Honeywell Int’l, Inc. v. Hamilton Sundstrand Corp.*, 378 F. Supp. 2d 459, 465 (D. Del. 2005) (same).

the infringing products.<sup>20</sup> While these factors might be useful to the extent they shed light on what the parties would have expected and thus agreed to ex ante, they are usually applied without regard to the differences between ex ante market transactions and ex post valuation.<sup>21</sup> Courts thus determine reasonable royalties largely on the basis of ex post factors that would not have affected an ex ante agreement and thus should not be taken into account in determining the market value of the patent license.<sup>22</sup> Because patents are most likely to be asserted and litigated against commercially successful products, the litigation is likely to result in an award of excessive damages and ongoing royalties.

*Fourth*, one of the most important factors used by courts to determine reasonable royalties that is polluted by ex ante considerations are other agreements by which the patent holder has licensed the patents-in-suit. In principle, other agreements should be the best evidence of the value of a license, but that is true only if the agreements actually reflect the market value of the license. Only ex ante agreements that are entered into when the technology user had a realistic option of walking away from the deal reflect the market value of the technology. Agreements entered into ex post tend to exaggerate the value of the license because they reflect the lock-in effects described above and because they reflect the fact that the alternative to an agreement is litigation.<sup>23</sup> The litigation alternative creates not only the specter of a reward of excessive royalties but also the risk of an injunction that might take from the innocent infringer much or all of its investment and expectancy in the infringing business.

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20. These include factors 6, 8, 10, 11, and 13, all of which are based on ex post market developments. See *Georgia-Pacific*, 318 F. Supp. at 1120.

21. See, e.g., *Monsanto Co. v. Ralph*, 382 F.3d 1374, 1382–84 (Fed. Cir. 2004) (affirming a royalty award that was so high that defendant would not have made a profit and consequently would have never agreed to ex ante).

22. See, e.g., *Automated Technologies v. Knapp Logistics & Automation, Inc.*, 382 F. Supp. 2d 1368, 1371 (N.D. Ga. 2005) (applying *Georgia-Pacific* factors such as “established profitability of the product made under the patent, its commercial success; and its current popularity”).

23. See William F. Lee & A. Douglas Melamed, *Breaking the Vicious Cycle of Patent Damages*, 101 CORNELL L. REV. (forthcoming 2015), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2577462](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2577462) [<http://perma.cc/4JPU-4SAC>] (explaining why ex post agreements embody excessive royalties).

In sum, the value of something, including a patent license, depends on the alternatives available to the parties. The value of a patent license to an innocent infringer, an ex post license, depends in part on the diminished value of non-infringing alternatives and in larger part on the shadow of the litigation alternative. For these reasons, ex post agreements exceed the ex ante market value benchmark. Those inflated agreements are then relied upon to determine reasonable royalties in subsequent litigation and put upward pressure on royalties embodied in subsequent agreements. The result is a vicious cycle of over-rewarding patent holders.<sup>24</sup>

### III. IMPLICATIONS OF AND CURES FOR EXCESSIVE INFRINGEMENT REMEDIES

Excessive patent remedies cause the perverse effects described above. They increase the cost of using patented technologies. This in turn deters development and commercialization of products that use the patented invention and subsequent innovation.

Excessive remedies for patent infringement have other perverse effects as well. First, they encourage excessive patenting.<sup>25</sup> Companies in recent years have substantially increased the numbers of patents they file, not because their inventive activity has increased but because their lawyers have advised them to increase the size of their patent portfolios.<sup>26</sup> This is true both because patents are excessively rewarded and thus have increased commercial value and because a large patent portfolio can be used both defensively to deter or resolve patent assertions against the company and offensively to increase their rivals' costs of doing business.<sup>27</sup> Companies that cannot obtain

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24. *See id.*

25. Cf. Chris Berry et. al, PWC, *2014 Patent Litigation Study: As case volume leaps, damages continue general decline* 12 (2014) (“[B]oth the number of patent cases filed and the number of patents granted continued to grow rapidly in 2013.”).

26. See Colleen V. Chien, *From Arms Race to Marketplace: The Complex Patent Ecosystem and Its Implications for the Patent System*, 62 HASTINGS L.J. 297, 302–10 (2010) (discussing the patent “arms race”).

27. *Id.*; see also Michael Rodriguez & Wallace Dunwoody, *The Sword and the Shield: Building an Offensive and Defensive IP Portfolio*, INSIDE COUNSEL (May 6, 2014),



a large enough patent arsenal from their own inventions often end up paying huge sums, in some case billions of dollars, to acquire patents from third parties.<sup>28</sup> None of this is itself productive or wealth-creating activity. It is often little more than a giant and very costly public choice game.

Excessive remedies for patent infringement, like other flaws in the legal system, attract opportunists that seek to profit from the flaws. In the patent world, those opportunists are the non-practicing entities or so-called “trolls.”<sup>29</sup> They acquire and assert patents solely in order to monetize them at the expense of companies that use technologies in their products and services and their customers. Excessive rewards for patent monetization induce excessive investment in troll business models and patent assertion activities.

The extraordinary costs of patent litigation have not gone unnoticed.<sup>30</sup> Various reforms were enacted in the Leahy-Smith America Invents Act (AIA),<sup>31</sup> and others have been proposed to Congress. Some suggested reforms, like the provisions for expanded *inter partes* review, seek to address the important different but related problem of too many bad or trivial patents;<sup>32</sup> that problem is beyond the scope of this Essay. Others—including provisions regarding joinder of parties in litigation,<sup>33</sup>

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<http://www.insidecounsel.com/2014/05/06/the-sword-and-the-shield-building-an-offensive-and> [<http://perma.cc/8BJZ-M4XR>].

28. See Charan J. Sandhu, Jeffrey D. Osterman & Kyle C. Krpata, *Strategic Patent Acquisitions: Evaluating and Acquiring Patent Portfolios*, PRACTICAL LAW, June 2013, at 40, 42.

29. See generally Lemley & Melamed, *supra* note 7.

30. See, e.g., Steve Lohr, *With Patent Litigation Surging, Creators Turn to Washington for Help*, N.Y. TIMES (Apr. 29, 2015), [http://www.nytimes.com/2015/04/30/technology/with-patent-litigation-surging-creators-turn-to-washington-for-help.html?\\_r=0](http://www.nytimes.com/2015/04/30/technology/with-patent-litigation-surging-creators-turn-to-washington-for-help.html?_r=0) [<http://perma.cc/VU5H-VRLY>]; Dave Thier, *More than \$20 Billion Spent on Patent Litigation in Two Years*, FORBES (Oct. 8, 2010, 11:50 AM), <http://www.forbes.com/sites/davidthier/2012/10/08/in-two-years-the-smartphone-industry-has-spent-more-than-20-billion-spent-on-patent-litigation/> [<http://perma.cc/PW3X-4U2T>].

31. 112 Pub. L. 112–29, 125 Stat. 284.

32. See, e.g., Eric C. Cohen, *A Primer on Inter Partes Review, Covered Business Method Review, and Post-Grant Review Before the Patent Trial and Appeal Board*, 24 FED. CIR. B.J. 1 (2014–15).

33. See 35 U.S.C. § 299; see also David O. Taylor, *Patent Misjoinder*, 88 N.Y.U. L. REV. 652, 654 (2013) (“In enacting [the Leahy-Smith America Invents Act (AIA), which created a new statutory section, 35 U.S.C. § 299], Congress and the President took a significant step toward correcting a perceived problem plaguing patent infringement

venue,<sup>34</sup> fee shifting,<sup>35</sup> customer stays,<sup>36</sup> pleading,<sup>37</sup> and discovery<sup>38</sup>—could shift the balance of power between patent holder and technology user a bit in ways that might ameliorate the problem of excessive remedies for patenting.<sup>39</sup> Finally, recent court decisions, including those involving standard-essential patents,<sup>40</sup> smallest saleable unit,<sup>41</sup> fee-shifting,<sup>42</sup> and declaratory judgments,<sup>43</sup> appear already to have had the salutary effect of reducing excessive patent remedies.

None of these steps, however, attacks the fundamental problem: the application of legal rules developed for the paradigmatic case of the guilty infringer to the very different case of the innocent infringer without a clear and explicit appreciation of how the ex post world differs from the ex ante world as-

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litigation—so-called ‘patent trolls’ joining numerous unrelated accused infringers in inconvenient venues.”).

34. See Paul R. Gugliuzza, *Patent Litigation Reform: The Courts, Congress, and the Federal Rules of Civil Procedure*, 95 B.U. L. REV. 279, 298–99 (2015); Li Zhu, Note, *Taking Off: Recent Changes to Venue Transfer of Patent Litigation in the Rocket Docket*, 11 MINN. J.L. SCI. & TECH. 901 (2010).

35. See Emily H. Chen, *Making Abusers Pay: Deterring Patent Litigation By Shifting Attorneys’ Fees*, 28 BERKELEY TECH. L.J. 351 (2013); Gugliuzza, *supra* note 34, at 285–86; Thomas H. Kramer, *Proposed Legislative Solutions to the Non-Practicing Entity Patent Assertion Problem: The Risks for Biotechnology and Pharmaceuticals*, 39 DEL. J. CORP. L. 467, 488 (2014).

36. See Kramer, *supra* note 35, at 486.

37. See, e.g., Gugliuzza, *supra* note 34, at 283–85; Kramer, *supra* note 35, at 487; Jared A. Smith & Nicholas R. Transier, *Trolling for an NPE Solution*, 7 HASTINGS SCI. & TECH. L.J. 215, 235–37 (2015).

38. See, e.g., Gugliuzza, *supra* note 34, at 285; Kramer, *supra* note 35, at 487; Smith & Transier, *supra* note 37, at 237–38.

39. See, e.g., Kramer, *supra* note 35.

40. See, e.g., *Microsoft Corp. v. Motorola, Inc.*, 696 F.3d 872 (9th Cir. 2012); *Realtek Semiconductor Corp. v. LSI Corp.*, 946 F. Supp. 2d 998 (N.D. Cal. 2013).

41. See, e.g., *Virnetx, Inc. v. Cisco Systems, Inc.*, 767 F.3d 1308, 1327–28 (Fed. Cir. 2014); *Laserdynamics, Inc. v. Quanta Computer, Inc.*, 694 F.3d 51, 67–68 (Fed. Cir. 2012); *AVM Techs., LLC v. Intel Corp.*, No. 10-610-RGA, 2013 WL 126233, at \*2 (D. Del. Jan. 4, 2013); *Broadcom Corp. v. Emulex Corp.*, Nos. SACV 09-01058-JVS (ANx), CV 10-03963-JVS (ANx), 2011 WL 11025895 (C.D. Cal. Dec. 13, 2011).

42. See *Octane Fitness, LLC v. ICON Health & Fitness, Inc.*, 134 S. Ct. 1749, 1756 (2014) (refusing to impose an “inflexible framework onto statutory text that is inherently flexible,” tasking district courts with considering the totality of the circumstances in determining whether a case was “exceptional” so that attorneys’ fees might be awarded).

43. See, e.g., *Medtronic, Inc. v. Mirowski Family Ventures, LLC*, 134 S. Ct. 843 (2014); *Sun Style Int’l, LLC v. Sunless, Inc.*, No. 1:12-CV-00179, 2013 WL 3967923 (W.D. Ky. Aug. 1, 2013).

sumed in the paradigmatic case. Ending excessive patent remedies and the costs they impose requires explicit differentiation between the case of guilty infringers and the case of innocent infringers in order to avoid polluting the determination of patent remedies by the kinds of ex post factors that would not affect an ex ante agreement, and thus do not affect the market value of the license, but so often result in excessive remedies under current law.