

Patent Fair Use 2.0

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I. INTRODUCTION

In their book, *The Patent Crisis and How the Courts Can Solve It*, Dan Burk and Mark Lemley argue that patent law should be tailored to industry characteristics.¹ They then explore doctrinal mechanisms by which courts can and should take up the laboring oar to accomplish the necessary tailoring. Burk and Lemley explore possibilities for industry-sensitive adjudication at numerous points throughout the patent lifecycle—from patent acquisition through claim interpretation to remedies.² Essentially absent (or present only in faint echoes) from their catalog of current and potential “policy levers” for the courts are infringement exemptions. The absence is striking in light of the fact that copyright law, which has been much more prone than patent law to legislative accommodation to particular industries,³ nonetheless retains a robust judicial policy lever at the infringement stage—the fair use doctrine.⁴ Though striking, the lack of discussion is not at all surprising. Patent law has no fair-use-type doctrine and the “research exemptions” that exist are either very narrow⁵ or available only in highly specific circumstances.⁶

In this Article, I will argue that a fair-use-type infringement exemption should take its place in patent law’s toolbox of policy levers and propose specific factors that should govern such an exemption.⁷

A. The Noncontextual Focus of Patent Doctrine

Particularly in the United States, policing the scope of patent rights has been, at least in principle, a highly front-loaded enterprise, in which the patent scope determination is intentionally divorced from the context of infringement. An extensive set of patent validity doctrines, including limits on patentable subject matter;⁸ the requirements of utility,⁹ novelty,¹⁰ and nonobviousness;¹¹ the written

1. DAN L. BURK & MARK A. LEMLEY, *THE PATENT CRISIS AND HOW THE COURTS CAN SOLVE IT* (2009).

2. *Id.* at chs. 9–10.

3. See, e.g., Jessica Litman, *DIGITAL COPYRIGHT* 35–63 (2006). For an updated discussion of copyright legislative history, see Jessica Litman, *Real Copyright Reform*, 96 *IOWA L. REV.* 1, 1–7 (2010).

4. For an excellent recent overview and analysis of the fair use doctrine in copyright law, see Pamela Samuelson, *Unbundling Fair Uses*, 77 *FORDHAM L. REV.* 2537 (2009).

5. *Madey v. Duke Univ.*, 307 F.3d 1351, 1362 (Fed. Cir. 2002) (ruling that university research did not qualify for the “very narrow and strictly limited” common law research exemption).

6. See 35 U.S.C. 271(e)(1) (2006) (exemption for research related to FDA approval). See also Katherine J. Strandburg, *The Research Exemption to Patent Infringement: The Delicate Balance Between Current and Future Technical Progress*, in 2 *INTELLECTUAL PROPERTY AND INFORMATION WEALTH* (Peter Yu ed., 2006).

7. In this effort I will build on the seminal work on “patent fair use,” Maureen A. O’Rourke, *Toward a Doctrine of Fair Use in Patent Law*, 100 *COLUM. L. REV.* 1177 (2000).

8. 35 U.S.C. § 101 (2006).

9. 35 U.S.C. §§ 101, 112 (2006).

10. 35 U.S.C. § 102 (2006).

11. 35 U.S.C. § 103 (2006).

description, enablement, and best mode requirements;¹² and the requirement of definite claims¹³ have served as a series of “doors”¹⁴ through which a prospective patentee must pass to obtain patent protection. The perspective of the “person having ordinary skill in the art,” or PHOSITA, has been the primary mechanism by which the hurdles to obtaining patent protection are adjusted to particular technological areas.¹⁵ At least until recently, once a patent was obtained, patent exclusivity was unyielding: injunctions were virtually certain at the end of a successful patent infringement suit¹⁶ and compulsory licenses were scorned.¹⁷ An up-front-focused system has several purported advantages. Focusing the debate over patent rights at the front end is intended to bring certainty and, similarly to property rights in other contexts, to provide secure rewards to those who invest in technology and thus facilitate a market.¹⁸

Of course, this system has never been as simple as the up-front doctrinal focus suggests. The validity of patent claims is commonly challenged at the point of enforcement during litigation.¹⁹ Though supposedly independent of the context of infringement, claim interpretation is also a ubiquitous subject of dispute in litigation.²⁰ On the infringement side, the doctrine of equivalents developed to ensure that patentees were not deprived of their rewards by “unscrupulous copyists”²¹ or, in more recent iterations, by unforeseeable and tangential

12. 35 U.S.C. § 112 (2006).

13. *Id.*

14. Application of Bergy, 596 F.2d 952, 960 (C.C.P.A. 1979) *vacated in part sub nom.* Diamond v. Chakrabarty, 444 U.S. 1028 (1980) and *aff'd sub nom.* Diamond v. Chakrabarty, 447 U.S. 303 (1980).

15. See, e.g., Rebecca S. Eisenberg, *Obvious to Whom? Evaluating Inventions from the Perspective of the PHOSITA*, 19 BERKELEY TECH. L.J. 885 (2004); Cyril A. Soans, *Some Absurd Presumptions in Patent Cases*, 10 IDEA 433, 438 (1966) (coining the name “Mr. PHOSITA”).

16. eBay Inc. v. MercExchange, L.L.C., 547 U.S. 388, 393–94 (2006) (describing the Federal Circuit’s approach to injunctions in patent cases). The Supreme Court in *eBay*, *id.* at 394, softened this rule to some extent in some circumstances as discussed further *infra*.

17. See, e.g., Colleen M. Chien, *Cheap Drugs at What Price to Innovation: Does the Compulsory Licensing of Pharmaceuticals Hurt Innovation?*, 18 BERKELEY TECH. L.J. 853, 857–64 (2003); Joseph A. Yosick, *Compulsory Patent Licensing for Efficient Use of Inventions*, 2001 U. ILL. L. REV. 1275 (discussing the history of compulsory licensing in the United States).

18. Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089, 1092–93 (1972). For discussions of the debate over the merits of “property rules” and “liability rules” in intellectual property, see, for example, JAMES BESSEN & MICHAEL J. MEURER, *PATENT FAILURE: HOW JUDGES, BUREAUCRATS, AND LAWYERS PUT INNOVATORS AT RISK* (2008); Daniel A. Crane, *Intellectual Liability*, 88 TEX. L. REV. 253 (2009); Mark A. Lemley & Philip J. Weiser, *Should Property or Liability Rules Govern Information?*, 85 TEX. L. REV. 783 (2007); Robert P. Merges, *Contracting into Liability Rules: Intellectual Property Rights and Collective Rights Organizations*, 84 CAL. L. REV. 1293 (1996); see also *MercExchange, L.L.C. v. eBay, Inc.*, 401 F.3d 1323, 1326 (Fed. Cir. 2005) (“Because the ‘right to exclude recognized in a patent is but the essence of the concept of property,’ the general rule is that a permanent injunction will issue once infringement and validity have been adjudged.”) *vacated* 547 U.S. 388 (2006).

19. 6 DONALD S. CHISUM, *CHISUM ON PATENTS* §19.02 (2010).

20. See, e.g., Dan L. Burk & Mark A. Lemley, *Fence Posts or Sign Posts? Rethinking Patent Claim Construction*, 157 U. PA. L. REV. 1743 (2009) and many references therein.

21. *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 339 U.S. 605, 607 (1950).

technological developments.²² Nonetheless, the basic conception of a system of up-front barriers followed by secure rights is well ensconced.²³

Around the turn of the twenty-first century, there began to be widespread dismay over the state of the patent system.²⁴ A number of factors contributed to the sense that something had gone wrong. Globalization of the system under the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement) pitted (or at least seemed to pit) patent rights against critical public health interests.²⁵ Patent protection expanded into subject areas, such as business methods, software, and biotechnology, in which it was more difficult to define

22. *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 304 F.3d 1289, 1290 (Fed. Cir. 2002).

23. For discussions and critiques of the Federal Circuit's bright line "formalistic" approach, see, for example, Jeffrey A. Lefstin, *The Formal Structure of Patent Law and the Limits of Enablement*, 23 BERKELEY TECH. L.J. 1141, 1142–51 (2008) (describing the "new formalism of patent law" and the treatment of patent validity and infringement as conceptually separate and "binary" determinations); Rochelle C. Dreyfuss, *In Search of Institutional Identity: The Federal Circuit Comes of Age*, 23 BERKELEY TECH. L.J. 787 (2008); Timothy R. Holbrook, *The Supreme Court's Complicity in Federal Circuit Formalism*, 20 SANTA CLARA COMPUTER & HIGH TECH. L.J. 1 (2003); John R. Thomas, *Formalism at the Federal Circuit*, 52 AM. U. L. REV. 771 (2003).

24. See, e.g., FEDERAL TRADE COMM'N, TO PROMOTE INNOVATION: THE PROPER BALANCE OF COMPETITION AND PATENT LAW AND POLICY (2003), available at <http://www.ftc.gov/os/2003/10/innovationrpt.pdf> (describing recommendations for proper balance between competition, law and policy in the patent context); NAT'L RESEARCH COUNCIL OF THE NAT'L ACADEMICS, A PATENT SYSTEM FOR THE 21ST CENTURY (Stephen A. Merrill, Richard C. Levin & Mark B. Myers eds., 2004), and references therein; Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 SCI. 698 (1998) (describing underuse of scarce resources resulting from patent privatization); Adam B. Jaffe & Josh Lerner, INNOVATION AND ITS DISCONTENTS: HOW OUR BROKEN PATENT SYSTEM IS ENDANGERING INNOVATION AND PROGRESS AND WHAT TO DO ABOUT IT (2004); Rochelle C. Dreyfuss, *Pathological Patenting: The PTO as Cause or Cure*, 104 MICH. L. REV. 1559 (2006) (critiquing Jaffe and Lerner for their emphasis on patent invalidity and pointing out other potential sources of problems with the patent system).

25. See generally Margaret Chon, *Intellectual Property and the Development Divide*, 27 CARDOZO L. REV. 2821, 2829–39 (2006) (describing the overly simplistic conception of "intellectual property globalization" as a binary analysis that considers only protection of knowledge and consumer access while ignoring social welfare maximization); Rochelle Cooper Dreyfuss, *TRIPS-Round II: Should Users Strike Back?*, 71 U. CHI. L. REV. 21, 21–22 (2004) (describing how the TRIPS agreement encourages expansion of intellectual property rights, but keeps deregulation subject to WTO, which in turn increases the price of end products); Daniel J. Gervais, *Intellectual Property, Trade & Development: The State of Play*, 74 FORDHAM L. REV. 505, 511–14 (2005) (describing the significance of Paragraph 6 of the Doha Declaration in the TRIPS Agreement, which seems to shed light on the intent of the TRIPS agreement to provide for public health needs); Peter Yu, *TRIPS and Its Discontents*, 10 MARQ. INTELL. PROP. L. REV. 369, 386–410 (2006) (discussing how developing countries might use the TRIPS Agreement to move forward); see also Thomas W. Pogge, *Human Rights and Global Health: A Research Program*, 36 METAPHILOSOPHY 182 (2005) (discussing the impact of TRIPS on biotechnology and pharmaceuticals); Symposium, *Intellectual Property, Trade and Development: Accommodating and Reconciling Different National Levels of Protection*, 82 CHI.-KENT L. REV. 1109 (2007) (collecting articles discussing the impact of intellectual property agreements on public health and agriculture); Symposium, *Traditional Knowledge, Intellectual Property, and Indigenous Culture*, 11 CARDOZO J. INT. & COMP. L. 239, (2003) (collecting articles discussing the impacts of intellectual property agreements on indigenous cultures, plants, and medicines).

rights than it had been in the paradigmatic chemical and mechanical fields.²⁶ These and other factors led to a burgeoning of the sheer number of patents the United States Patent and Trademark Office (PTO) was required to consider.²⁷ Technological changes increased the importance of both cumulative innovation and complex products, lending greater salience to overlapping patent rights.²⁸ Innovation paradigms are also evolving, with user innovation, open innovation, and collaborative and open source approaches playing increasingly important roles.²⁹ Rather than purchasing products over which the patent rights are “exhausted” by the sale,³⁰ consumers increasingly are licensees (and hence potential infringers) with ongoing obligations to patent holders.

Besides leading to a sense, at least in many quarters, of a patent system run amok, these changes drove a wedge between industries, since the changes played out in technology-specific ways.³¹ In response, proposals for reform abounded. Legislation was introduced repeatedly in Congress and, as Burk and Lemley explain, repeatedly was stymied by opposing pressures from different industry sectors.³²

With the legislature at an impasse, the courts—particularly the Supreme Court³³—and the PTO stepped in beginning in the 2000s with attempts to rein in

26. See, e.g., BESSEN & MEURER, *supra* note 18, at 245–46 and references therein.

27. See, e.g., Bronwyn H. Hall, *Exploring the Patent Explosion*, 30 J. TECH. TRANSFER 35 (2005).

28. There is a large and contentious literature on this topic, which is reviewed recently (and skeptically) in Jonathan Barnett, *Property as Process: How Innovation Markets Select Innovation Regimes*, 119 YALE L.J. 384 (2009).

29. See, e.g., YOCHAI BENKLER, *THE WEALTH OF NETWORKS* (2006); Katherine J. Strandburg, *Users as Innovators: Implications for Patent Doctrine*, 79 U. COLO. L. REV. 467 (2008); Katherine J. Strandburg, *Evolving Innovation Paradigms and the Global Intellectual Property Regime*, 41 CONN. L. REV. 861 (2009) and references therein.

30. See *Quanta Computer, Inc. v. LG Elecs., Inc.*, 553 U.S. 617 (2008) (reaffirming that the patent exhaustion doctrine precludes a patent holder from asserting a claim against a third-party purchaser).

31. BURK & LEMLEY, *supra* note 1.

32. *Id.* See also Jay P. Kesan & Andres A. Gallo, *The Political Economy of the Patent System*, 87 N.C. L. REV. 1341 (2009). Note, however, that at this writing there is renewed optimism regarding the potential for passage of substantive patent reform legislation. See Patent Reform Act of 2011 S. 23, 112th Cong. § 5 (as passed by the Senate, Mar. 8, 2011). The current legislation would not provide the kind of ex post contextually sensitive enforcement advocated here, however.

33. See *Quanta*, 553 U.S. 617 (2008) (reaffirming that the patent exhaustion doctrine precludes a patent holder from asserting a claim against a third-party purchaser); *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 418 (2007) (rejecting a rigid requirement that obviousness be demonstrated by evidence of a “teaching, suggestion, or motivation to combine” prior art references); *Microsoft Corp. v. AT&T Corp.*, 550 U.S. 437, 456 (2007) (rejecting an expansive interpretation of infringement provision involving component parts of a patented product manufactured domestically but assembled and sold abroad); *MedImmune, Inc. v. Genentech, Inc.*, 549 U.S. 118, 137 (2006) (holding a party is not required to break a license agreement “before seeking a declaratory judgment in federal court that the underlying patent is invalid, unenforceable, or not infringed”); *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 394 (2006) (holding that standard principles of equity apply when granting injunctive relief in patent disputes); *Ill. Tool Works, Inc. v. Indep. Ink, Inc.*, 547 U.S. 28, 45–46 (2006) (finding that a patent does not automatically confer market power); *Lab. Corp. of Am. Holdings v. Metabolite*

perceived over-patenting. Commentators have also been prolific with suggestions for improving “patent quality.”³⁴

Shortly before this Essay went to press, on September 16, 2011, the Leahy-Smith America Invents Act was signed into law.³⁵ The legislation enacts some far-reaching changes, such as establishing a version of a “first-to-file” system³⁶ and significantly expanding post-grant review.³⁷

With important exceptions, to which I will return, the reform proposals and recent judicial and legislative interventions have maintained the focus on better defining the ex-ante scope of patent exclusive rights.³⁸

One important example of this focus is the Supreme Court’s opinion in *KSR v. Teleflex*,³⁹ in which the Court arguably raised the bar to patentability by recognizing that at least some level of creativity is the province of the ordinary artisan.⁴⁰ More recently, the Supreme Court and Federal Circuit have moved to rein in the scope of patentable subject matter, particularly with regard to the interpretation of the ban on the patenting of “abstract ideas” which is crucial to determining the scope of patent rights in business methods and software.⁴¹ The Federal Circuit had adopted a virtually unbounded “useful, concrete, and tangible

Laboratories, Inc., 548 U.S. 124, 138 (2006) (Breyer, J., dissenting) (criticizing the Court for choosing not to decide this case and supporting a more restrictive view of patentable subject matter); Merck KGaA v. Integra Lifesciences I, Ltd., 545 U.S. 193, 208 (2005) (holding that “the use of patented compounds in preclinical studies is protected” and is not infringement in most circumstances). *See also* John F. Duffy, *The Festo Decision and the Return of the Supreme Court to the Bar of Patents*, 2002 SUP. CT. REV. 273 (2002).

34. One rough measure of the interest in the topic is that a LexisNexis search in the US Law Reviews and Journals database yields 402 hits for the phrase “patent quality” (search conducted on May 4, 2010) while there were only 22 such hits prior to 2000.

35. Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011).

36. *Id.* at § 3.

37. *Id.* at § 6.

38. To be sure, commentators have debated when, as a matter of procedure and administrability, it is best to expend resources to determine the scope of patent rights definitively. *See, e.g.*, Shubha Ghosh & Jay Kesan, *What do Patents Purchase? In Search of Optimal Ignorance in the Patent Office*, 40 HOUS. L. REV. 1219 (2004); Jay P. Kesan, *Carrots and Sticks to Create a Better Patent System*, 17 BERKELEY TECH. L.J. 763 (2002); F. Scott Kieff, *The Case for Registering Patents and the Law and Economics of Present Patent-Obtaining Rules*, 45 B.C. L. REV. 55 (2003); Mark A. Lemley, *Rational Ignorance at the Patent Office*, 95 N.W. U. L. REV. 1495 (2001). These discussions still generally presume a conceptual separation between the definition of patent scope and the context of infringement, however. *See* Jeffrey A. Lefstin, *supra* note 23 at 1147 (describing the Federal Circuit’s “rigid conceptual separation” between infringement and validity determination). Perhaps closest in spirit to the approach I advocate here are recent proposals for a return to a central claiming regime. *See, e.g.*, Jeanne C. Fromer, *Claiming Intellectual Property*, 76 U. CHI. L. REV. 719 (2009); Burk & Lemley, *supra* note 20. These proposals still assume, however, that there is a proper scope of patent exclusivity, as against all comers, even if it is most desirable as a practical and administrative matter to determine that scope in light of the accused product or process.

39. *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398 (2007).

40. *Id.* at 421.

41. *In re Bilski*, 545 F.3d 943, 950 (Fed. Cir. 2008) *aff’d but criticized sub nom.* *Bilski v. Kappos*, 130 S. Ct. 3218 (2010).

result” test for patentable subject matter.⁴² Heeding signals of discontent with such a broad approach to patentable subject matter from at least some Supreme Court justices, the PTO began to issue more patentable subject matter rejections and the Federal Circuit moved to narrow its approach.⁴³ The Supreme Court addressed the issue in 2010.⁴⁴ While rejecting the Federal Circuit’s attempt to enshrine a specific “machine or transformation of matter” test for unpatentable “abstract ideas,”⁴⁵ the Supreme Court, in a divided opinion, rejected the overly permissive “useful, concrete, and tangible result” test, and reaffirmed its traditional concerns about the patenting of abstract ideas. While there was no majority for a categorical ban on business method patents, four justices would have banned them,⁴⁶ while another four expressed the point of view that business method patents “raise special problems in terms of vagueness and suspect validity” and suggested that it might be possible to craft a categorical rule against patenting some (as-yet-unspecified) category of business methods.⁴⁷ The PTO has also made efforts to improve up-front quality control through measures such as “second pair of eyes” review⁴⁸ and its experimental “peer-to-patent” program.⁴⁹

The Federal Circuit’s claim construction jurisprudence reflects various attempts to establish an up-front clarity for the scope of patent rights, including the focus on the specification and prosecution history as sources of claim interpretation,⁵⁰ the ill-fated attempt to use dictionaries to establish claim term meanings,⁵¹ the downplaying of “extrinsic evidence” and of the factual underpinnings of claim interpretation,⁵² and the insistence that claim meaning be established independently of the product or process that is accused of infringement.⁵³ Recent expansions in the written description⁵⁴ and utility⁵⁵

42. *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368, 1373 (Fed. Cir. 1998).

43. *See, e.g., In re Comiskey*, 554 F.3d 967 (Fed. Cir. 2009); *Bilski*, 545 F.3d 943; *In re Nuijten*, 515 F.3d 1361 (Fed. Cir. 2008).

44. *Bilski*, 130 S. Ct. 3218.

45. *Id.* at 3226–27.

46. *Id.* at 3231 (Stevens, J., concurring).

47. *Id.* at 3229. The Supreme Court will revisit the patentable subject matter question in the currently pending case of *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, No. 10-1150.

48. *See, e.g., John R. Allison & Starling D. Hunter, On the Feasibility of Improving Patent Quality One Technology at a Time: The Case of Business Methods*, 21 BERKELEY TECH. L.J. 729, 734–35 (2006) (describing the PTO’s “second pair of eyes” review of business method patent applications).

49. *See* PEER TO PATENT, <http://www.peertopatent.org> (last visited Sept. 28, 2011).

50. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1315–17 (Fed. Cir. 2005) (en banc); *Vitronics Corp. v. Conceptor, Inc.*, 90 F.3d 1576, 1582–83 (Fed. Cir. 1996).

51. *Phillips*, 415 F.3d at 1319–24; *Texas Digital Sys. v. Telegenix, Inc.*, 308 F.3d 1193 (Fed. Cir. 2002).

52. *Phillips*, 415 F.3d at 1317–19; *Cybor Corp. v. Fas Technologies*, 138 F.3d 1448 (Fed. Cir. 1998) (en banc). *But see Cybor*, 138 F.3d at 1473–78 (Rader, J., dissenting) (criticizing the Federal Circuit for adopting a de novo review standard for claim construction).

53. *Markman v. Westview Instruments, Inc.*, 517 U.S. 370 (1996). *See* 5A DONALD S. CHISUM, CHISUM ON PATENTS § 18.03[1][b] (2010).

doctrines similarly focus on reining in overpatenting at the front end.

The long-running back-and-forth between the Federal Circuit and the Supreme Court concerning the contours of the doctrine of equivalents can also be seen largely as a colloquy over the extent to which claim scope can and should be set in stone at issuance.⁵⁶ While the doctrine eventually established recognizes the theoretical possibility of a need to encompass activity beyond the scope of the literal claims,⁵⁷ the foreseeability approach ensures that cases applying the doctrine will be few and far between.⁵⁸

Unfortunately, the results of the focus on up-front clarity have not been encouraging. Claim construction, for example, remains a mess, with the Federal Circuit disagreeing with the district courts in a large number of cases.⁵⁹ Validity is routinely disputed in litigation, though it is possible that the recently expanded post-grant review procedures will improve the situation.⁶⁰ In some industries, notably in information technology, claim scope uncertainty appears to limit the effectiveness of patents, except in portfolios.⁶¹

54. *Ariad Pharmaceuticals, Inc. v. Eli Lilly & Co.*, 598 F.3d 1336 (Fed. Cir. 2010) (en banc).

55. *In re Fisher*, 421 F.3d 1365 (Fed. Cir. 2005).

56. *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 493 F.3d 1368 (Fed. Cir. 2007); *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722 (2002); *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 234 F.3d 558 (Fed. Cir. 2000) (en banc); *Warner-Jenkinson Co. v. Hilton Davis Chemical Co.*, 520 U.S. 17 (1997) *supplemented*, 64 F.3d 675 (Fed. Cir. 1995) and *rev'd*, 520 U.S. 17, 117 S. Ct. 1040, 137 L. Ed. 2d 146 (1997) and *adhered to*, 114 F.3d 1161 (Fed. Cir. 1997); *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 72 F.3d 857 (Fed. Cir. 1995); *Hilton Davis Chem. Co. v. Warner-Jenkinson Co.*, 62 F.3d 1512 (Fed. Cir. 1995) (en banc). The doctrine of equivalents imposes infringement liability when an allegedly infringing product or process does not fit literally within a patent's claims but would be considered "insubstantially different" by a PHOSITA. For example, an older case considered seminal to the development of the modern doctrine of equivalents is *Winans v. Denmead*, 56 U.S. 330 (1853). In that case the Court held that a freight car with an octagonal cross-section infringed a patent claiming a car in the shape of a frustum of a cone. Essentially, the Court held that an octagonal cross-section was equivalent to the claimed circular cross-section in terms of its technological function. More recent cases largely confine the scope of the doctrine of equivalents to equivalents that would have been unforeseeable at the time of patenting, at least for claims that have been amended during patent prosecution. Since many, if not most, claims are amended, this is a significant cabining of the doctrine.

57. *Festo*, 535 U.S. at 740.

58. John R. Allison & Mark A. Lemley, *The (Unnoticed) Demise of the Doctrine of Equivalents*, 59 STAN. L. REV. 955, 977-78 (2007).

59. See, e.g., Christian A. Chu, *Empirical Analysis of the Federal Circuit's Claim Construction Trends*, 16 BERKELEY TECH. L.J. 1075 (2001); Kimberly A. Moore, *Are District Court Judges Equipped to Resolve Patent Cases?*, 15 HARV. J.L. & TECH. 1 (2001); Kimberly A. Moore, *Markman Eight Years Later: Is Claim Construction More Predictable?*, 9 LEWIS & CLARK L. REV. 231 (2005); Lee Petherbridge, *The Claim Construction Effect*, 15 MICH. TELECOMM. TECH. L. REV. 215 (2008). Michael Saunders, *A Survey of Post-Phillips Claim Construction Cases*, 22 BERKELEY TECH. L.J. 215 (2007).

60. See, e.g., Jay P. Kesan, *Carrots and Sticks to Create a Better Patent System*, *supra* note 38; Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011). It is unclear how effective the new proceedings will be at reducing validity challenges during infringement litigation, given that proceedings must be instituted within nine months of patent grant.

61. BESSEN & MEURER, *supra* note 18; Christopher A. Cotropia & Mark A. Lemley, *Copying in Patent Law*, 87 N.C. L. REV. 1421 (2009); Mark A. Lemley, *Ignoring Patents*, 2008 MICH. ST. L. REV. 19

Thus, while there is much to be said for well-defined patent scope, experience demonstrates that there are important limitations, both theoretical and practical, to an entirely up-front approach. These limitations include the unpredictability of technology, and hence the inability to determine a priori how much downstream innovation a particular claim will be deemed to encompass⁶² or how intertwined a particular patented invention will become with other “pieces” of technology;⁶³ the fact that patented technology, especially in some industries, is employed in contexts in which the spillover effects of exclusive rights vary widely;⁶⁴ and the inability to determine whether a particular invention might otherwise be independently invented and disseminated by another inventor before the expiration of the twenty-year patent term.⁶⁵ Commentators have also questioned the efficiency of investing in clearly determining property rights up front, in light of the very large fraction of patents that are never licensed, traded, or enforced (a clear distinction from real and personal property).⁶⁶ Some have even suggested reverting to a registration system for patents in light of the difficulties in examining patents at issuance.⁶⁷

These limitations, which are very real, are in some respects the flip side of the frequently invoked concern with hindsight bias⁶⁸ (and the less frequently

(2008); Stuart Graham, Robert Merges, Pam Samuelson & Ted Sichelman, *High Technology Entrepreneurs and the Patent System: Results of the 2008 Berkeley Patent Survey*, 24 BERKELEY TECH. L.J. 1255, 1321–22 (2009) (less than one-quarter of D&B software start-up companies do patent searches, while about thirty percent of venture-backed software companies do so); Gideon Parchomovsky & R. Polk Wagner, *Patent Portfolios*, 154 U. PA. L. REV. 1 (2005); Ronald J. Mann & Thomas W. Sager, *Patents, Venture Capital, and Software Start-ups*, 36 RES. POL'Y 201, 203–04 (2007), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=802806. (software start-ups do not do patent searches).

62. Patent jurisprudence recognized this issue early on, particularly in discussions of the scope of patentable subject matter. *Gottschalk v. Benson*, 409 U.S. 63, 67–68 (1972); *O'Reilly v. Morse*, 56 U.S. 62, 113 (1853).

63. See Heller & Eisenberg, *supra* note 24, for a discussion of the potential for “anticommons” problems with upstream patenting.

64. For example, an invention may serve both as a commercial product (e.g. a pharmaceutical or diagnostic test) and as a research tool. The implications of exclusive rights may be quite different in the two contexts. For a discussion of this distinction, see Katherine J. Strandburg, *User Innovator Community Norms: At the Boundary Between Academic and Industry Research*, 77 FORDHAM L. REV. 2237 (2009).

65. The Federal Circuit has at times considered near-simultaneous invention to be indicative of obviousness and at other times declined to do so. See 2 DONALD S. CHISUM, CHISUM ON PATENTS, 5.05[7] (2010); *Env'tl. Designs, Ltd. v. Union Oil Co. of California*, 713 F.2d 693, 698 n.7 (Fed. Cir. 1983).

66. Lemley, *supra* note 61.

67. F. Scott Kieff, *The Case for Registering Patents and the Law and Economics of Present Patent-Obtaining Rules*, 45 B.C. L. REV. 55 (2003).

68. See, e.g., *In re Dembiczak*, 175 F.3d 994, 997 (Fed. Cir. 1999) *abrogated by In re Gartside*, 203 F.3d 1305 (Fed. Cir. 2000); Gregory N. Mandel, *Patently Non-Obvious: Empirical Demonstration that the Hindsight Bias Renders Patent Decisions Irrational*, 67 OHIO ST. L.J. 1391 (2006); Gregory Mandel, *Patently Non-Obvious II: Experimental Study on the Hindsight Issue before the Supreme Court in KSR v. Teleflex*, 9 YALE J. L. & TECH. 1 (2007).

invoked, but equally important, countervailing attribution error⁶⁹). While hindsight bias and the attribution error arise because of the difficulty in truly appreciating the past,⁷⁰ the failings of a focus on ex ante boundary setting arise from the generally more severe difficulties in anticipating the future of technological evolution. The quest for ex ante certainty in intellectual property rights is doomed to failure. Nothing in our experience with real or personal property can really compare to the radical uncertainty that is endemic to patent law. While there may be occasional situations in which the value of a piece of real property drastically changes as a result of, say, a discovery of valuable minerals, a decision to build a shopping mall down the street (or even an economic recession), uncertainty moves from the periphery to the center when it comes to intellectual property. Moreover, the overlapping nature of patent rights dramatically increases the potential for windfalls and the extent to which windfalls spill over to implicate the future of innovation.

Given the important implications of technological unpredictability, one might expect patent law to have developed a robust set of ex post doctrines to deal with it.⁷¹ This has not been the case. Where such doctrines have been

69. See, e.g., Joseph S. Miller, *Hoisting Originality*, 32 CARDOZO L. REV. 451, 485 n. 164 (2009) (noting “the fundamental attribution error, according to which people tend to overestimate the power of personality, and underestimate the power of situation, in explaining human behavior”); Bradford S. Simon, *Intellectual Property and Traditional Knowledge: A Psychological Approach to Conflicting Claims of Creativity in International Law*, 20 BERKELEY TECH. L.J. 1613 (2005).

70. Well-recognized difficulties of this type in patent law include: i) the difficulty in determining, especially at the time of examination, whether a particular invention is nonobvious or whether it is simply part of an ongoing stream of routine advances. See, e.g., articles within *Business Law Forum: Nonobviousness—The Shape of Things to Come*, 12 LEWIS & CLARK L. REV. 323–598 (2008); and ii) the imprecision of language, and hence the inability to ensure that claim terms will be interpreted as conceived of by the patentee and examiner at the time of examination. See, e.g., *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 731–32 (2002) (discussing limitations of language as a rationale for the doctrine of equivalents). These difficulties are exacerbated by the inability of non-technically-trained judges and juries to capture accurately the perspective of the PHOSITA. About this quandary, Learned Hand, writing in 1911, opined:

I cannot stop without calling attention to the extraordinary condition of the law which makes it possible for a man without any knowledge of even the rudiments of chemistry to pass upon such questions as these. The inordinate expense of time is the least of the resulting evils, for only a trained chemist is really capable of passing upon such facts, e.g., in this case the chemical character of Von Furth’s so-called “zinc compound,” or the presence of inactive organic substances. In Germany, where the national spirit eagerly seeks for all the assistance it can get from the whole range of human knowledge, they do quite differently. The court summons technical judges to whom technical questions are submitted and who can intelligently pass upon the issues without blindly groping among testimony upon matters wholly out of their ken. How long we shall continue to blunder along without the aid of unpartisan and authoritative scientific assistance in the administration of justice, no one knows; but all fair persons not conventionalized by provincial legal habits of mind ought, I should think, unite to effect some such advance.

Parke-Davis & Co. v. H. K. Mulford Co., 189 F. 95, 115 (C.C.D.N.Y. 1911).

71. The unpredictability I focus on here is distinct from a form of unpredictability that is recognized in patent doctrine—the concept of “unpredictable arts.” See, e.g., Sean B. Seymore, *The Enablement Pendulum Swings Back*, 6 NW. J. TECH. & INTELL. PROP. 278 (2008) (describing the

developed in the past, for the most part mere vestiges of them remain today. Thus, as already discussed, the doctrine of equivalents plays very little role in today's infringement determinations.⁷² Doctrines that might cabin the enforcement of patent rights have fared much worse. The exemption for experimental use of patented inventions, with the exception of a statutory exemption focused on dealing with regulatory delay in the pharmaceutical context, has shrunk arguably to the point of nonexistence in Federal Circuit case law.⁷³ The so-called "reverse doctrine of equivalents," which allows courts to find noninfringement in cases where an accused product or process fits within the claim scope despite radical change by the infringer, is occasionally acknowledged but never applied.⁷⁴ The Federal Circuit has clarified that there is no "de minimis" exception to patent infringement.⁷⁵ The doctrine of patent misuse is rarely successful at the Federal Circuit; moreover, what it reaches outside of antitrust violations is increasingly unclear.⁷⁶ Unlike some other jurisdictions, the United States has no recent history of working requirements⁷⁷ and makes very limited use of compulsory licensing.⁷⁸

implications for "unpredictable arts" for patent disclosure doctrine). The doctrine of "unpredictable arts" recognizes the ex ante unpredictability of success for inventive efforts in some arenas, whereas I focus here on the unpredictability of how technology will progress after invention.

72. Allison & Lemley, *supra* note 58.

73. For a review of both the general and specific exemptions, see Katherine J. Strandburg, *The Research Exemption to Patent Infringement: The Delicate Balance Between Current and Future Technical Progress*, in 2 INTELLECTUAL PROPERTY AND INFORMATION WEALTH 107, 112–16 (Peter Yu ed., 2006).

74. BURK & LEMLEY, *supra* note 1, at 128; Roche Palo Alto, L.L.C. v. Apotex, Inc., 531 F.3d 1372, 1378 (Fed. Cir. 2008) ("The reverse doctrine of equivalents is rarely applied, and this court has never affirmed a finding of non-infringement under the reverse doctrine of equivalents."). In *Scripps Clinic & Research Found. v. Genentech, Inc.*, 927 F.2d 1565, 1569 (Fed. Cir. 1991) *clarified on denial of reconsideration*, 89-1541, 1991 WL 523489 (Fed. Cir. Apr. 30, 1991) and *overruled by* *Abbott Laboratories v. Sandoz, Inc.*, 566 F.3d 1282 (Fed. Cir. 2009) the Federal Circuit considered a reverse doctrine of equivalents argument in a case involving "human Factor VIII:C, a complex protein that occurs naturally in normal blood and is essential to the clotting of blood." *Id.* at 1568. The patentee had discovered a process for isolating factor VIII:C from blood plasma to a high level of purity. The product claims at issue encompassed factor VIII:C of a particular purity and potency. The accused infringer, Genentech, had produced factor VIII:C using a recombinant process that did not involve the purification of naturally occurring factor VIII:C. Genentech argued that its recombinantly produced factor VIII:C was non-infringing under the reverse doctrine of equivalents because it was "changed 'in principle'" from the patented substance. *Id.* at 1581. It argued that "the specific activities and purity that are obtainable by recombinant technology exceed those available by the Scripps process." *Id.* The court reversed the district court's grant of summary judgment on infringement, suggesting that the reverse doctrine of equivalents might apply in these circumstances, depending upon the facts. Unfortunately for those favoring revival of the doctrine, the case settled and the issue was never brought to trial.

75. See, e.g., *Abbott Labs*, 566 F.3d at 1299.

76. See 6 DONALD S. CHISUM, CHISUM ON PATENTS § 19.04 (2010); Robin C. Feldman, *The Insufficiency of Antitrust Analysis for Patent Misuse*, 55 HASTINGS L.J. 399, 425–31 (2003).

77. 6 DONALD S. CHISUM, CHISUM ON PATENTS § 19.04 (2010).

78. Joshua D. Sarnoff & Christopher M. Holman, *Recent Developments Affecting the Enforcement, Procurement, and Licensing of Research Tool Patents*, 23 BERKELEY TECH. L.J. 1299, 1351–55 (2008).

Of course, skeptics will respond to arguments in favor of contextual infringement exemptions with a number of critiques. First, one might argue that incorporating infringement exemptions and defenses into patent law will undermine the certainty of rights that is the aim of the emphasis on defined patent scope. Second, one might argue that exemptions and defenses will undermine incentives to invent, disclose, and disseminate (through commercialization) new technology.⁷⁹ Both of these arguments have some appeal, but neither is sufficient to outweigh the potential benefits of appropriately tailored post hoc policy levers.

Given the current state of things, it is not at all clear that much certainty would be lost by adopting a set of exemptions and defenses sensitive to the context of an alleged infringement. In practice, as already discussed, the validity and scope of a patent are not finally determined until the outcome of litigation is known. If an infringement exemption can do a reasonably predictable job of improving social welfare at the back end, it may be worth some additional blurring of the already muddy boundaries of patent rights. If we institute a fair-use-type infringement exemption, both inventors and users of patented technology will naturally incorporate the potential for such exemptions into their planning (including licensing negotiations). Indeed, the primary distinction between the present situation and one with a robust system of exemptions is not really between ex ante certainty and ex post adaptability, but between a system that recognizes the significance of the context in which patented technology is used and one that does not.

The potential effects of contextualized infringement determinations on incentives are also insufficient grounds to reject these potential policy levers outright. First, as the example of the doctrine of equivalents shows, it is possible to use ex post doctrines to enhance a patentee's position as well as to weaken it.⁸⁰ Moreover, any cabining of patent rights—whether through patentable subject matter, obviousness, utility, or any other doctrine—in principle reduces some kinds of incentives. On the flip side, any expansion of patent rights—via any doctrine—in principle adds to the deadweight loss of exclusivity. The point of using doctrines as policy levers,⁸¹ however, is to get beyond this standoff to consider questions such as “Incentives to do what?” or “What specific decreased incentives in exchange for what particular social benefits?”⁸²

79. For discussions of the traditional incentive theories of patenting, see, for example, Roger D. Blair & Thomas F. Cotter, *Rethinking Patent Damages*, 10 TEX. INTELL. PROP. L.J. 1, 78–80 (2001); Rebecca S. Eisenberg, *Patents and the Progress of Science: Exclusive Rights and Experimental Use*, 56 U. CHI. L. REV. 1017, 1024–28 (1989); Katherine J. Strandburg, *What Does the Public Get? Experimental Use and the Patent Bargain*, 2004 WIS. L. REV. 81 (2004).

80. See Timothy R. Holbrook, *Equivalency and Patent Law's Possession Paradox*, 23 HARV. J.L. & TECH. 1, 17–18 (2009) (discussing implications of assessing equivalency at time of infringement).

81. Dan L. Burk & Mark A. Lemley, *Policy Levers in Patent Law*, 89 VA. L. REV. 1575, 1642–48 (2003).

82. A similar argument responds to any concerns about the effects of implementing a “fair-

Instituting ex post exemptions and defenses is one way to tailor patent rights to these more specific questions. So, for example, where the increase in incentives provided by enforcing patent rights in a particular context is small relative to the costs of exclusivity or the social cost of the additional incentives is particularly large, an exemption or defense can carve out specific types of uses, using a scalpel rather than a cleaver to shape a socially beneficial patent scope.

Allowing more flexibility at the time of infringement would also take the pressure off of doctrines such as patentable subject matter and claim construction. For example, I have argued elsewhere for a “business method use” exemption, which would avoid the difficulties inherent in determining, from abstract claim language, whether a particular claimed invention “is” a business method.⁸³ Similarly, I have argued that a research-use exemption can avoid the need to determine whether a particular invention “is” a research tool in the abstract.⁸⁴ Such ex ante (and unavoidably abstract) determinations would be necessary to implement patentable subject matter exclusions, but are not necessary to implement use exemptions. Almost by definition, an infringement exemption can account for the fact that different uses of patented technology have different social costs and benefits. Neither social nor private costs and benefits are all-or-nothing quantities.

One important exception to the present dearth of ex post policy levers in patent law arises out of the Supreme Court’s 2006 decision in *eBay v. MercExchange*.⁸⁵ There, a unanimous Supreme Court overturned a Federal Circuit rule that virtually guaranteed an injunctive remedy for infringement.⁸⁶ The Court ruled instead that the grant of an injunction is a discretionary measure decided after considering a “well-established” four-factor test, taking into account whether the plaintiff can establish “(1) that it has suffered an irreparable injury; (2) that remedies available at law, such as monetary damages, are inadequate to compensate for that injury; (3) that, considering the balance of hardships between

use-type” exemption on ex ante licensing transactions. The value of patent rights directly affects the outcome of licensing negotiations. Uncertainty in the scope of rights affects transaction costs. To the extent that a fair-use-type exemption increases uncertainty it will increase transaction costs. But a carefully designed exemption may not lead to a large increase in transaction costs overall. This is because an exemption will clarify rights in some instances (i.e., it will be possible to predict with reasonable certainty that there is no liability even if the scope of the patent claims is uncertain), have no effect in many cases (where there is clearly infringement and clearly no exemption), and have only a minor effect in many other circumstances (where there is already a high degree of uncertainty as to the scope of the rights).

83. Katherine J. Strandburg, *What If There Were a Business Method User Exemption to Patent Infringement?* 2008 MICH. ST. L. REV. 245, 248–50 (2008).

84. Strandburg, *Users as Innovators*, *supra* note 29, at 500.

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

86. *MercExchange, L.L.C. v. eBay, Inc.*, 401 F.3d 1323, 1338 (Fed. Cir. 2005) (“Because the ‘right to exclude recognized in a patent is but the essence of the concept of property,’ the general rule is that a permanent injunction will issue once infringement and validity have been adjudged.”), *rev’d sub nom.* *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 393–94 (2006).

the plaintiff and defendant, a remedy in equity is warranted; and (4) that the public interest would not be disserved by a permanent injunction.⁸⁷ The justices differed as to the extent to which this test aimed to take account of changes in the innovation environment,⁸⁸ but lower courts have relied on the case to provide leeway to take account of the effects that patent injunctions can have on complex, interrelated technologies, particularly in dealing with nonpracticing entities.⁸⁹ Besides exercising discretion with respect to the granting of injunctions, courts have begun to award ongoing royalties—which have many of the same effects as compulsory licenses.⁹⁰

Of course, after *eBay*, one must ask whether more is needed. Is the discretion now afforded to courts at the remedies stage sufficient to provide ex post contextual policy levers where they are desirable? There are three basic reasons why the answer to this question is “no.” First, as mentioned above, the *eBay* factors are not tailored to promote innovation. There is no particular reason to think that courts applying them will make the most socially beneficial choices about when to grant (or not to grant) injunctive relief. Thus, at the very least, it would be desirable to explore factors that courts should consider in making the decision. Second, there are reasons to anticipate specific types of market failures in patent licensing that are not illuminated by the *eBay* test. Many of these parallel those that have been advanced to justify fair use in copyright law. Third, there are situations in which the social costs of exclusivity in a particular context simply outweigh the social benefits of the additional patent incentive provided by infringement liability in that context, such that use in that context should be permitted without conditions. The ex ante doctrines of patentable subject matter, nonobviousness, and so on cannot identify these situations.

The lower courts’ responses to the *eBay* ruling demonstrate that district court judges, at least, find it useful to have some mechanism for ex post tailoring at their disposal. The extent to which courts have grasped at this slim reed of ex post tailoring power raises the question whether there might be other and better ways to design a set of “policy levers” to be applied at the time of infringement. The rest of this Article considers that question. Part II reviews a previous proposal for “patent fair use” and discusses how social and technological changes since that proposal was made have bolstered the case for a fair-use-type exemption and provided insights into how it should be designed. Part III discusses proposals to

87. *eBay*, 547 U.S. at 391.

88. *Compare id.* at 394–95 (Roberts, J., concurring), *with id.* at 395–97 (Kennedy, J., concurring).

89. *See, e.g.*, Stacy Streur, *The eBay Effect: Tougher Standards but Courts Return to the Prior Practice of Granting Injunctions for Patent Infringement*, 8 NW. J. OF TECH. & INTELL. PROP. 67 (2009).

90. *See, e.g.*, *Paice L.L.C. v. Toyota Motor Corp.*, 504 F.3d 1293, 1316 (Fed. Cir. 2007) (majority and concurrence debating whether ongoing royalties constitute a compulsory license). *See also* H. Tomás Gómez-Arostegui, *Prospective Compensation in Lieu of a Final Injunction in Patent and Copyright Cases*, 78 FORDHAM L. REV. 1661 (2010).

deal with some of the issues discussed in Part II either by beefing up existing doctrine or by some form of an independent inventor defense and concludes that those proposals are less desirable than a general fair-use-type defense. For similar reasons, the prior user defense enacted in the America Invents Act is also an insufficient solution. Part IV provides the justification for the “patent fair use 2.0” proposal, sets it out in some detail, and then illustrates how it might be applied to the cases of open source software and essential medicines. Part V concludes.

II. WHY PATENT FAIR USE NOW?

A. Professor O’Rourke’s Patent Fair Use Proposal

This Article is certainly not the first to recognize many of these justifications for infringement exemptions. In particular, a groundbreaking article by Maureen O’Rourke over ten years ago proposed a version of “patent fair use” based on many of the considerations that will be discussed here.⁹¹ Reasoning by analogy to fair use in copyright law and expanding on existing patent doctrines, O’Rourke identified a list of five factors, which she argued should form the basis of a patent fair use doctrine: “i) the nature of the advance represented by the infringement; ii) the purpose of the infringing use; iii) the nature and strength of the market failure that prevents a license from being concluded; iv) the impact of the use on the patentee’s incentives and overall social welfare; and v) the nature of the patented work.”⁹²

O’Rourke’s explication of these factors focused on the potential for market failure in the patent system and on the implications of a fair use finding for patentee incentives to invent. Thus, for instance, she notes that “commercial use is much more likely to harm the patentee’s incentives without a corresponding increase in social welfare,”⁹³ points to the statutory exemption for use of patented inventions to prepare for Food and Drug Administration (FDA) approval as an example of a situation in which the social value of certain types of infringement has been deemed to outweigh any corresponding depression of incentives,⁹⁴ and discusses a number of situations in which fair use could be used to ensure that patentees do not have overly broad ability to hamper follow-on innovation. For example, her first factor is included for reasons similar to those justifying the reverse doctrine of equivalents—to protect radical improvers from holdup by earlier patentees.⁹⁵

O’Rourke focuses heavily on the need for fair use in circumstances in which network effects give patentees overly broad control over markets extending

91. O’Rourke, *supra* note 7.

92. *Id.* at 1205.

93. *Id.* at 1206.

94. *Id.* at 1197–98.

95. *Id.* at 1228–30.

beyond the market for the patented invention itself,⁹⁶ discussing the case of software application programming interfaces (APIs) in detail.⁹⁷ She recognizes the potential for licensing breakdown in situations involving complex products that implicate many patents (the “anticommons” problem) and the related possibility that licensing breakdown might undermine the “blocking patents” doctrine.⁹⁸ The blocking patents doctrine assumes that those who improve significantly upon patented inventions will be able to coordinate exploitation of the improvement with the initial patentee because both parties will be motivated to cross-license.⁹⁹

Importantly, O’Rourke suggests that a fee should sometimes be charged for patent “fair use.”¹⁰⁰ In this respect her proposal foreshadows the practices of those district courts that have ordered ongoing royalties while denying injunctions in the wake of *eBay*.¹⁰¹

B. Signs of the Times: O’Rourke’s Concerns Remain Valid Today

Most of the arguments O’Rourke made in her 2000 article remain compelling today. Indeed, in many respects, O’Rourke’s article was ahead of its time. Many of the justifications she advanced for some form of patent fair use have become considerably stronger in recent years. While the anticommons problem was recognized at the turn of this century, the particular issues raised by nonpracticing entities (so-called “patent trolls”) in relation to complex technology were not yet widely recognized.¹⁰² By 2006, however, Justice Kennedy’s concurrence in *eBay v. MercExchange* responded explicitly to concerns about nonpracticing entities and the problem of holdup for complex technologies.¹⁰³ Similarly, while the research exemption was a topic of concern in 2000, the Federal Circuit’s 2002 *Madey v. Duke* opinion heightened concerns about the diminishing scope of the common law exemption.¹⁰⁴ The issue of unauthorized research tool use remains much

96. *Id.* at 1233–34.

97. *Id.* at 1211–35.

98. *Id.* at 1236–39. *See also* Robert Merges, *Intellectual Property Rights and Bargaining Breakdown: The Case of Blocking Patents*, 62 TENN. L. REV. 75 (1994).

99. O’Rourke, *supra* note 7, at 1194.

100. *Id.* at 1234–35.

101. *See* discussion, *supra*.

102. The first use of the term “patent troll” in a law review article, for example, was in 2003. Michael J. Meurer, *Controlling Opportunistic and Anti-Competitive Intellectual Property Litigation*, 44 B.C. L. REV. 509 (2003).

103. *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 396 (2006) (“An industry has developed in which firms use patents not as a basis for producing and selling goods but, instead, primarily for obtaining licensing fees. . . . For these firms, an injunction, and the potentially serious sanctions arising from its violation, can be employed as a bargaining tool to charge exorbitant fees to companies that seek to buy licenses to practice the patent.”) (Kennedy, J., concurring).

104. *Madey v. Duke Univ.*, 307 F.3d 1351, 1361–63 (Fed. Cir. 2002) (experimental use defense persists in a “very narrow form”). Though, the Supreme Court did preserve a broad reading of the statutory FDA exemption. *Merck KGaA v. Integra Lifesciences I, Ltd.*, 545 U.S. 193 (2005).

discussed and unresolved.¹⁰⁵ Longstanding concerns about the applicability of patent infringement doctrine to reverse engineering of software, a central focus of O'Rourke's analysis, also remain.¹⁰⁶

C. Signs of the Times: Evolving Reasons for Patent Fair Use

Not only have developments over the past ten years heightened some of the concerns motivating O'Rourke's fair use proposal, but also new issues have come to the fore that both provide additional rationales for a fair-use-type infringement exemption and help us to flesh out factors relevant to such an exemption.

Traditionally, one could divide the world of potential patent infringers into several categories: commercial users of industrial processes, commercial manufacturers of patented products, innovators building upon patented products or processes, and consumers of patented products. Commercial users of industrial processes and manufacturers of patented products could be expected to negotiate patent licenses. Follow-on innovators were protected by a complex of patent doctrines: the reverse doctrine of equivalents (or its predecessors) in principle protected radical innovators from holdup by earlier inventors; the experimental use exemption permitted inventors to build upon the patent disclosures of earlier inventors; and the doctrine of blocking patents, which allows the patenting of improvements without the permission of earlier inventors (in contrast to the situation in copyright law),¹⁰⁷ encouraged inventors of complementary inventions to negotiate cross-licenses. In a world dominated by manufacturer innovation, there was little need to worry about infringement by what we would now call end users of technology. Consumers of patented products were protected by the doctrine of patent exhaustion (which holds that a patentee's rights in a particular artifact are "exhausted" when the artifact is sold to a consumer by an authorized manufacturer).¹⁰⁸

Recent changes in law and technology have changed the landscape. Traditional approaches may no longer suffice to induce the optimal level of invention, disclosure, and dissemination of new technology. Here I discuss five important developments that provide reasons for concern about the balance among patent exclusivity, access, and follow-on innovation: i) the increasing

105. *Merck KGaA*, 545 U.S. at 205 n.7 (explicitly leaving open the status of research tools under the statutory research exemption); *Proveris Sci. Corp. v. Innovasystems, Inc.*, 536 F.3d 1256 (Fed. Cir. 2008) (device used in development of FDA submissions, but not itself subject to FDA approval, was not covered by statutory research exemption). *See also* Strandburg, *Users as Innovators*, *supra* note 29, at 502–03.

106. Jeanne C. Fromer, *Patent Disclosure*, 94 IOWA L. REV. 539 (2009).

107. *See* Julie Cohen & Mark Lemley, *Patent Scope and Innovation in the Software Industry*, 89 CAL. L. REV. 1, 23–25 (2001).

108. The Supreme Court recently reaffirmed this doctrine in *Quanta Computer, Inc. v. LG Elecs., Inc.*, 128 S. Ct. 2109, 2117 (2008). *See also* 5 DONALD S. CHISUM, CHISUM ON PATENTS § 16.03[2][a] (2010).

importance (and recognition of) nontraditional paradigms of innovation, including open source approaches and user innovation, especially within communities of users; ii) a breakdown of the effectiveness of patent exhaustion and repair and reconstruction as a means to take consumers out of the patent infringement loop; iii) growing evidence of the ineffectiveness of patent notice and search, especially in some technological arenas; iv) increasing recognition of the prevalence of independent invention among potential infringers; and v) the increasing ubiquity of software in technology, which is accompanied by a growing separation of design from manufacture and a movement toward mass customization. Each of these developments upsets assumptions underlying the traditional patent regime, changing the balance of costs and benefits of patenting in ways that may justify broader infringement exemptions.

1. *Alternative Paradigms of Innovation*

Numerous patent doctrines reflect an assumption of an industrial seller innovator. Yet, as others and I have discussed in more detail elsewhere, that paradigm is increasingly out of date.¹⁰⁹ The success of the open source software movement, with its increasingly important role in commercial ventures, is itself a game changer.¹¹⁰ Moreover, that success has spawned a number of attempts to introduce similar collaborative models into other arenas, including biotechnology,¹¹¹ agriculture,¹¹² and traditional tangible products.¹¹³ Alongside the growing importance of this particular model of collaborative innovation is increasing recognition of the importance of users as technology innovators and of the extent to which groups of users of similar technology often share their inventions freely with one another, even in commercial contexts.¹¹⁴ Technological

109. See, e.g., Strandburg, *Users as Innovators*, *supra* note 29; BENKLER, *supra* note 29; see ERIC VON HIPPEL, *DEMOCRATIZING INNOVATION* (2005).

110. See STEVEN WEBER, *THE SUCCESS OF OPEN SOURCE* (2004); Siobhán O'Mahony & Beth Bechky, *Boundary Organizations: Enabling Collaboration Among Unexpected Allies*, 53 ADMIN. SCI. Q. 422 (2008).

111. For a recent review of these efforts, see Emily Marden, *Open Source Drug Development: A Path to More Accessible Drugs and Diagnostics?*, 11 MINN. J.L. SCI. & TECH. 217 (2010). See also Strandburg, *Evolving Innovation Paradigms*, *supra* note 29.

112. See, e.g., Keith Aoki, "Free Seeds, Not Free Beer": *Participatory Plant Breeding, Open Source Seeds, and Acknowledging User Innovation in Agriculture*, 77 FORDHAM L. REV. 2275 (2009).

113. For an interesting example of such a project see QUIRKY INC., <http://www.quirky.com> (last visited Sept. 28, 2011). Of course, community innovation of tangible products is not at all new. See, e.g., Nikolas Franke & Sonali Shah, *How Communities Support Innovative Activities: An Exploration of Assistance and Sharing Among End-Users*, 32 RES. POL'Y 157 (2003) (studying community innovation among users of sports equipment).

114. VON HIPPEL, *supra* note 109; Dietmar Harhoff et al., *Profiting from Voluntary Information Spillovers: How Users Benefit by Freely Revealing Their Innovations*, 32 RES. POL'Y 1752 (2003); Joachim Henkel, *Selective Revealing in Open Innovation Processes: The Case of Embedded Linux*, 35 RES. POL'Y 953 (2006); Eric von Hippel & Georg von Krogh, *Free Revealing and the Private Collective Model for Innovation Incentives*, 36 R&D MGMT. 295 (2006).

shifts, especially the increasing importance of software as a component of technology and of computers as means for facilitating collaboration, suggest that the contribution of these nontraditional paradigms is likely to grow.¹¹⁵

Where user, open, or collaborative innovation predominates, a number of basic assumptions of patent doctrine are undercut.¹¹⁶ Incentives to invent, disclose, and disseminate technology may be provided by use, by reciprocal exchange, or by other nonpatent mechanisms, decreasing the importance of patent incentives and correspondingly tilting the cost-benefit balance away from exclusivity. Such approaches sometime target markets underserved by or outside of the scope of the markets that are important to the patentee, thus decreasing the impact of infringement on the patentee's profits and increasing the potential positive social externalities of unauthorized use. Moreover, user, open, and collaborative innovations are often either unpatentable because of issues of inventorship due to their incremental and emergent origins or unpatented because their inventors do not wish to patent them or lack the funds to do so. Because these innovations are not patent protected, the blocking patent doctrine—patent law's mechanism for balancing rights between initial and follow-on inventors—breaks down.¹¹⁷

2. *The Declining Relevance of Patent Exhaustion and the Repair/Reconstruction Distinction*

Under the traditional seller innovator paradigm, the doctrines of patent exhaustion (corresponding to copyright's "first sale" doctrine)¹¹⁸ and repair/reconstruction¹¹⁹ provided significant protection for consumers against liability for patent infringement while making ordinary use and repair of their purchases. The protection provided by these doctrines is shrinking, however.

First, the position of users of patented products and processes has shifted drastically due to the increasing dominance of software and business method claims. More and more often, ordinary consumers find themselves in the position, not of purchasers of products over which patent rights have been exhausted, but of users of patented processes or "systems" to which patent exhaustion may not apply.¹²⁰ For example, ordinary consumers use most software products as

115. See, e.g., BENKLER, *supra* note 29; Carliss Baldwin & Eric von Hippel, *Modeling a Paradigm Shift: From Producer Innovation to User and Open Collaborative Innovation*, (HARV. BUS. SCH. Working Paper No 10-038, 2009), available at <http://hbswk.hbs.edu/item/6325.html>.

116. Strandburg, *Users as Innovators*, *supra* note 29.

117. Ex ante licensing approaches, such as the General Public License (GPL) often used in open source software, are of only limited use in the patent context, since infringers need not be copiers and thus need have no pre-existing relationship with a patentee in order to infringe. For an extensive recent discussion of the GPL, see Greg R. Vetter, *Commercial Free and Open Source Software: Knowledge Production, Hybrid Appropriability, and Patents*, 77 FORDHAM L. REV. 2087 (2009).

118. 17 U.S.C. §109 (2006).

119. 5 DONALD S. CHISUM, CHISUM ON PATENTS, §16.03[3] (2010).

120. The Supreme Court held in *Quanta Computer, Inc. v. LG Electronics, Inc.*, 553 U.S. 617, 638 (2008), that method patents may be exhausted by the sale of an item that "substantially

licensees. These licenses may contain both copyright- and patent-based limitations. While in most situations to date commercial entities mediate consumers' access to patented technology and provide any necessary licenses, those same licenses often purport to restrict significantly what purchasers can do with the technology.¹²¹ While the Supreme Court in *Quanta Computer, Inc. v. LG Elecs., Inc.* reaffirmed the doctrine of patent exhaustion, the Court specifically declined to address what limits (if any) apply to adhesion contract restrictions on consumer use.¹²² Lower courts have generally enforced such restrictions.¹²³

Moreover, patents are increasingly likely to cover things that users and small entrepreneurs can do and make for themselves, without a manufacturer or other commercial intermediary.¹²⁴ These types of actors generally have neither the sophistication nor the funds to engage in patent clearance searches (indeed, many have argued that even sophisticated players cannot effectively clear patent rights in the software and business method arenas¹²⁵). Nor do they have the wherewithal to engage effectively in case-by-case licensing transactions even if they do learn of a potentially relevant patent.

Similarly, in the past, the repair/reconstruction doctrine generally protected consumers when they engaged in intuitively reasonable manipulations of their patented purchases. Thus, in the "old" days, consumers found it unreasonable to be precluded from repairing things they had purchased, even if those items were patented. Patent doctrine recognized this expectation as legitimate.¹²⁶ Reconstruction of patented inventions, however, was much more likely to be the

embodies" the method. The scope of situations in which exhaustion applies to methods is not at all clear, however. The district court in *In re Katz Interactive Call Processing Patent Litig.*, 712 F. Supp. 2d 1080 (C.D. Cal. 2010) *aff'd in part, vacated in part, remanded*, 2009-1450, 2011 WL 607381 (Fed. Cir. Feb. 18, 2011), determined that exhaustion applied to sale of a service, for example, but the question was one of first impression and similar questions have not yet been addressed by other courts.

121. There are reasons to be concerned about the permissible scope and terms of these licenses. Others have discussed this issue, primarily in the context of software copyright licenses. *See, e.g.*, Molly Shaffer van Houweling, *The New Servitudes*, 96 GEO. L.J. 885 (2008); R. Anthony Reese, *The First Sale Doctrine in the Era of Digital Networks*, 44 B.C. L. REV. 577 (2003); Glen O. Robinson, *Personal Property Servitudes*, 71 U. CHI. L. REV. 1449 (2004); Elizabeth I. Winston, *Why Sell What You Can License? Contracting Around Statutory Protection of Intellectual Property*, 14 GEO. MASON L. REV. 93 (2006); Saami Zain, *Quanta Leap or Much Ado About Nothing? An Analysis of the Effects of Quanta vs. LG Electronics*, 20 ALB. L.J. SCI. & TECH. 67 (2010). I do not discuss it here.

122. *Quanta*, 553 U.S. at 637 n.7; *see also* *McFarling v. Monsanto Co.*, 545 U.S. 1139 (2005), denying certiorari in *Monsanto Co. v. McFarling*, 363 F.3d 1336 (Fed. Cir. 2004), which enforced a contractual restriction on use of second generation patented seeds.

123. *See* discussion of the case law in *Zain*, *supra* note 121.

124. This is the case for business method and software patents and increasingly may be the case for tangible goods as technology for "mass customization" through "toolkits" and for "3D printing" improves. *See, e.g.*, Simon Bradshaw et al., *The Intellectual Property Implications of Low-Cost 3D Printing*, 7 SCRIPTED 5 (2010) (discussing the issue in the context of UK law); Eric von Hippel, *Perspective: User Toolkits for Innovation*, 18 J. PROD. INNOVATION MGMT., 247 (2001).

125. BESSEN & MEURER, *supra* note 18; BURK & LEMLEY, *supra* note 1.

126. 5 DONALD S. CHISUM, CHISUM ON PATENTS §16.03[3] (2010).

province of commercial players.¹²⁷ The repair/reconstruction doctrine evolved to separate these two types of behavior, broadly privileging repair, even when it involved using aftermarket parts, while counting wholesale reconstruction of patented products as infringement (and thus protecting patentees from attempts by competitors to undermine patent exclusivity through the sale of “parts”).¹²⁸ Nowadays, in contrast, consumers are increasingly “prosumers,” who expect to interact with the products they purchase in creative and innovative ways.¹²⁹ The applicability of the repair/reconstruction distinction either to the increasing number of products that are licensed rather than purchased or to significant consumer customization is unclear at best.

3. Breakdown of Patent Notice and Search

Much has been written lately about the breakdown of the patent notice function in certain technological areas. As discussed in detail by Bessen and Meurer, this breakdown is due in part to inherent difficulties in describing software and business method inventions, in part to low standards for enablement and description in these areas, which permit broad and vaguely bounded claims, and in part to the unpredictability of claim construction, which can lead to patent coverage of inventions that were completely unforeseeable at the time of patenting.¹³⁰ The import of these problems is to increase the cost of patent search and decrease its effectiveness (to the point where, in software for instance, even sophisticated commercial players reportedly often opt out of patent clearance and hope for the best¹³¹).

Patent search problems will be even greater for those engaged in the new innovation paradigms. Consumer innovators lack the sophistication and funds to embark on searches. Moreover, emergent innovations such as open source software lack a central “blueprint” that even could be compared with patent

127. *Id.*

128. *See, e.g.,* Christopher A. Cotropia & Mark A. Lemley, *supra* note 61. *Copying in Patent Law*, 87 N.C. L. REV. 1421 (2009).

129. The term “prosumer” has taken on a variety of meanings. Here I adopt the meaning originated by Alvin Toffler, who coined the term in 1980, ALVIN TOFFLER, *THE THIRD WAVE* (1980), and discussed in a recent book Toffler co-authored with his wife, ALVIN TOFFLER & HEIDI TOFFLER, *REVOLUTIONARY WEALTH* (2006) (defining prosumer as “[o]ne who creates goods, services or experiences for his own satisfaction, rather than for sale or exchange”). The Tofflers’ predictions of “revolutionary wealth” are sadly pre-2008, but their predictions of a rise in “presumption” are reflected in widespread Web 2.0 phenomena and perhaps in an incipient wave of mass customization of tangible goods. *See also, e.g.,* Michael Weinberg, *It Will Be Awesome If They Don’t Screw It Up: 3D Printing, Intellectual Property, and the Fight over the Next Great Disruptive Technology*, PUBLIC KNOWLEDGE WHITE PAPER, Nov. 2010), <http://www.publicknowledge.org/it-will-be-awesome-if-they-dont-screw-it-up> (describing the emerging technology of 3D printing and its potential to empower users to customize and create products).

130. *See* BESSEN & MEURER, *supra* note 18.

131. Lemley, *Ignoring Patents*, *supra* note 61.

claims.¹³²

4. *The Importance of Independent Invention*

Though copying has never been a requirement of patent infringement (as it is for copyright infringement), much of traditional patent doctrine and rhetoric assumes implicitly that infringers are generally copyists.¹³³ While independent, nearly simultaneous invention has undoubtedly always been common, the extent to which infringement suits involve independent inventors as defendants is newly recognized and probably increasing as a result of the patent notice problems described in the previous section. Empirical studies at least suggest that a large fraction of accused infringers, if not most, are independent inventors (or at least are not copyists).¹³⁴

Independent invention (at least if it is close to, even if after, the time of patenting) diminishes the force of the free rider justification for patenting, suggesting that the patent incentive may not have been needed to induce a given invention.¹³⁵ Even if we need the prospect of a patent to induce a race to produce a particular innovation, economic arguments suggest that there is no need for a winner-take-all regime.¹³⁶

Moreover, fairness concerns weigh against imposing infringement liability on independent inventors; those concerns are enhanced when the preferred alternative—patent search—is expensive or infeasible. For all of these reasons, commentators have increasingly suggested either an independent inventor defense or other means to decrease the burden of patent liability for independent inventors.¹³⁷

132. While most open source software projects seem to have some kind of hierarchical structure for vetting “official” versions. *See* Weber, *supra* note 110. It seems unlikely, at least for a complex piece of software such as an operating system, that even the vetters have a complete view of the detailed implementation of algorithms in the various modules and all of their interactions. Moreover, one of the values of open source software is its customizability by users. Customizers are even less likely to be able to perform a proper patent clearing search.

133. *See, e.g.,* Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd., 535 U.S. 722, 727 (2002); Graver Tank & Mfg. Co. v. Linde Air Products Co., 339 U.S. 605, 607 (1950) (explaining the doctrine of equivalents as a defense against “unscrupulous copyists”).

134. *See, e.g.,* Christopher A. Cotropia and Mark A. Lemley, *supra* note 61, at 1440–49.

135. For this reason, nearly simultaneous invention is sometimes treated as a “secondary consideration” suggesting obviousness. *See* 2 DONALD S. CHISUM, CHISUM ON PATENTS § 5.05[7] (2010).

136. *See, e.g.,* Stephen M. Maurer & Suzanne Scotchmer, *The Independent-Invention Defense in Intellectual Property*, 69 *ECONOMICA* 535 (2002); Carl Shapiro, *Patent Reform: Aligning Reward and Contribution*, in 7 *INNOVATION POLICY AND THE ECONOMY*, 111 (Adam Jaffe et al. eds., 2007); Samson Vermont, *Independent Invention as a Defense to Patent Infringement*, 105 *MICH. L. REV.* 475 (2006).

137. *See, e.g.,* Mark A. Lemley, *Should Patent Infringement Require Proof of Copying?*, 105 *MICH. L. REV.* 1525 (2007); Oskar Liivak, *Rethinking the Concept of Exclusion in Intellectual Property*, 98 *GEO. L.J.* 1643 (2010); Shapiro, *supra* note 136; Vermont, *supra* note 136; Samson Vermont, *The Angel Is in the Big Picture: A Response to Lemley*, 105 *MICH. L. REV.* 1537 (2007).

One justification for nonetheless deeming independent inventors to be infringers relies on the idea that duplicative research is wasteful, a justification which is at least controversial.¹³⁸ Moreover, this justification makes sense only if the patent notice function is effective so that search costs are not too high. This does not seem to be the case in many arenas, as just discussed.

Another justification for holding independent inventors liable for infringement applies to those who keep their inventions as trade secrets. Potential infringement liability may induce some inventors to opt for patenting rather than trade secrecy.¹³⁹ It is not at all clear that trade secrecy is worse for society than patenting in situations where independent invention occurs, however. Independent inventors operating in secret are still presumably in competition with one another (at least if they are commercial inventors), so the public gets the benefit of lower prices, even if disclosure is delayed. Moreover, only one of these inventors need make the choice to freely reveal the invention to undermine the secrecy of the others. In any event, prior user defenses, which excuse infringement by independent inventors who do not make it to the patent office first, are common in other patent systems.¹⁴⁰ The United States has had a limited prior user defense in the business method patent arena¹⁴¹ for more than ten years without apparent ill effect. Indeed, the America Invents Act has made such a defense available generally to prior commercial users, if their use began more than one year before the application for the allegedly infringed patent was filed.¹⁴²

5. Mass Customization and the Separation Between Manufacture and Design

Much has been made in the copyright literature about the changing structure of the entertainment industry, from a system of centralized production aimed at mass markets to an increasingly decentralized and individualized marketplace, in which users play important roles in disseminating and creating content.¹⁴³ Similar

138. See, e.g., Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 870–79 (1990).

139. This theory is reflected in patent case law, which treats an inventor's own trade secret exploitation of an invention as "public use" but allows patenting in the face of a third party's secret use. See, e.g., *W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1550 (Fed. Cir. 1983) ("Early public disclosure is a linchpin of the patent system. As between a prior inventor who benefits from a process by selling its product but suppresses, conceals, or otherwise keeps the process from the public, and a later inventor who promptly files a patent application from which the public will gain a disclosure of the process, the law favors the latter."). Though the America Invents Act, Sec. 3, changes the prior art definitions in a number of ways, it retains the term "public use," which policy arguments suggest should continue to be interpreted in this way.

140. See Christopher Garrison, *Exceptions to Patent Rights in Developing Countries*, INT'L CENTRE FOR TRADE & SUSTAINABLE DEV., Issue Paper No. 17 (Oct. 2006) at 5–6, 49–50 (discussing prior user rights in various countries).

141. 35 U.S.C. § 273(b) (1999).

142. Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 5, 125 Stat. 284 (2011).

143. Daniel Gervais, *The Tangled Web of UGC: Making Copyright Sense of User-Generated Content*, 11 VAND. J. ENT. & TECH. L. 841 (2009); Jane C. Ginsburg, *Separating the Sory Sheep from the Grokster*

changes in the production of goods are under discussion in the management literature, but have been little noted in the legal literature.¹⁴⁴

Just as computer technology and the Internet have lessened (or even undermined) the need for identical mass-produced entertainment products, the increasing role of computerized design, manufacture, and operation with respect to tangible goods makes it easier to customize products and to design user-friendly “toolkits” for customization.¹⁴⁵ The line between user and manufacturer is beginning to blur. Moreover, some experts predict an increasing availability of custom fabrication plants and even of home equipment for “3D printing,” which will even more significantly blur the distinction between user and manufacturer and between designing and producing tangible goods.¹⁴⁶ If these predictions are realized, not only will consumers be more able to design their own products, but also there will likely be a growing number of “designer innovator” entrepreneurs who, rather than contracting with a manufacturer to produce products using their designs, will seek to market designs directly to consumers. Patents may or may not play an important role in such new business models.¹⁴⁷ In this brave new world, ordinary consumers may be able to make more extensive modifications of patented technology than was possible with earlier tangible goods. They may also be more likely to stumble upon patented technology through independent invention, to be able to make copies of patented technology for their own use, and to be “innocent purchasers” of infringing technology made by others. All of these developments taken together mean that it will become more and more likely that small entities (consumers or “designer innovators”), for whom the transaction costs involved in clearing patent rights would be prohibitive, will be patent

Goats: Reckoning the Future Business Plans of Copyright-Dependent Technology Entrepreneurs, 50 ARIZ. L. REV. 577 (2008); Debora Halbert, *Mass Culture and the Culture of the Masses: A Manifesto for User-Generated Rights*, 11 VAND. J. ENT. & TECH. L. 921 (2009); Steven A. Hetcher, *Using Social Norms to Regulate Fan Fiction and Remix Culture*, 157 U. PA. L. REV. 1869 (2009); Steven Hetcher, *Hume's Penguin, or, Yochai Benkler and the Nature of Peer Production*, 11 VAND. J. ENT. & TECH. L. 963 (2009); Mary W.S. Wong, *“Transformative” User-Generated Content in Copyright Law: Infringing Derivative Works or Fair Use?*, 11 VAND. J. ENT. & TECH. L. 1075 (2009).

144. See, e.g., VON HIPPEL, *DEMOCRATIZING INNOVATION*, *supra* note 109.

145. See, e.g., Nikolas Franke & Frank Piller, *Value Creation by Toolkits for User Innovation and Design: The Case of the Watch Market*, 21 J. PROD. INNOVATION MGMT. 401(2004); Nikolas Franke & Eric A. von Hippel, *Satisfying Heterogeneous User Needs via Innovation Toolkits: The Case of Apache Security Software*, 32 RES. POL'Y 1199 (2003); Eric A. von Hippel & Ralph Katz, *Shifting Innovation to Users via Toolkits*, 48 MGMT. SCI. 821 (2002); Lars Bo Jeppesen, *User Toolkits for Innovation: Consumers Support Each Other*, 22 J. PROD. INNOVATION MGMT. 347 (2005).

146. See, e.g., Simon Bradshaw et al., *The Intellectual Property Implications of Low-Cost 3D Printing*, 7 SCRIPTED 5 (2010) (discussing the issue in the context of UK law); Eric von Hippel, *Perspective: User Toolkits for Innovation*, 18 J. PROD. INNOVATION MGMT. 247 (2001); see also PUBLIC KNOWLEDGE WHITE PAPER, *supra* note 129, at 2 (“The machines can download plans for a wrench from the Internet and print out a real, working wrench. Users design their own jewelry, gears, brackets, and toys with a computer program, and use their machines to create real jewelry, gears, brackets, and toys.”).

147. This issue is worthy of more extensive consideration, which I do not attempt here.

infringers not protected by patent exhaustion or the repair/reconstruction doctrine.

III. EXISTING EX POST DOCTRINES AND RECENT PROPOSALS

While there is no general defense to patent infringement analogous to copyright's fair use doctrine, there are, as already discussed in passing, various ex post doctrines in patent law that seek to address the issues of transaction failures, the balance between initial and follow-on innovators, and the potential that overriding societal costs may outweigh the benefits of patenting. These doctrines are inadequate to the task of serving as effective policy levers for various reasons. As discussed above, some, such as the experimental use exemption¹⁴⁸ and prior user defense for business methods,¹⁴⁹ are too narrowly targeted or interpreted to serve the purpose. The expanded prior user defense in the America Invents Act remains ill-suited for ex post tailoring infringement liability to socially relevant context at the time of infringement. It applies across the board to all types of commercial use (and some noncommercial uses), regardless of context, but only reaches uses that began more than one year before the asserted patent was filed. Other doctrines, such as the reverse doctrine of equivalents¹⁵⁰ and patent misuse,¹⁵¹ are never or increasingly rarely applied. Still others, such as the doctrines of patent exhaustion and repair/reconstruction, are no longer adequate in light of social and technical changes. The most recent addition to the list—the discretion given to district court judges as a result of the Supreme Court's *eBay v. MercExchange* decision—is promising but at least to date inadequately tailored to the innovation issues motivating the patent system.

In light of the slim ex post options available under existing law, commentators have made a number of suggestions for reform. These suggestions fall primarily into two categories: proposals to beef up existing doctrines and proposals to deal with independent invention.

A. Proposals to Beef Up Existing Doctrines

A number of scholars (including this one) have argued for a more expansive research exemption, while others have disputed the wisdom of such an exemption.¹⁵² The Supreme Court has in fact taken an expansive approach to the statutory exemption for experimentation related to FDA approval.¹⁵³ While I

148. See also *supra* note 70; BURK & LEMLEY, *supra* note 1.

149. See also *id.*

150. See also *id.*

151. See also *id.*

152. For reviews of the literature see Sarnoff & Holman, *supra* note 78; Strandburg, *supra* note 6 (relating to both common law and statutory exemptions).

153. See, e.g., *Merck KGaA v. Integra Lifesciences I, Ltd.*, 545 U.S. 193 (2005); *Eli Lilly & Co. v. Medtronic, Inc.*, 496 U.S. 661 (1990).

continue to believe an expansive research exemption is a good idea, there are limits to what a piecemeal approach can accomplish (particularly if implemented by statute).

For example, I have argued elsewhere that a business method use exemption would be justified by arguments based on user innovation very similar to those I offered for expanding the research exemption.¹⁵⁴ Despite the similar justifications, these proposals raise entirely separate questions under existing law. Similarly, the statutory exemption from imposition of remedies (but not from infringement liability) for a medical practitioner's "performance of a medical or surgical procedure on a body"¹⁵⁵ is ill equipped to deal with issues raised by the outsourcing of diagnostic testing to independent laboratories, despite the fact that similar questions about doctors as user innovators and the importance of noncommercial motivations arise.¹⁵⁶ If we can identify common factors underlying various scenarios in which an infringement exemption would be desirable it is sensible to consider the merits of a more general fair-use-like doctrine.

The reverse doctrine of equivalents is, of course, a general approach and several authors (including Burk and Lemley in the book that is the impetus for this symposium) have suggested revitalizing it.¹⁵⁷ The doctrine, which the Federal Circuit recently described as "rarely invoked and virtually never sustained,"¹⁵⁸ might in principle have the potential to play a role similar to the role that "transformative use" plays in copyright's fair use doctrine.¹⁵⁹ It could be employed to deal with "blocking patent failure," in which bargaining between initial and follow-on inventors with overlapping patent rights breaks down or there is independent invention of a significant advance over a patented technology.

The reverse doctrine of equivalents is unlikely to rise to the occasion, however. The doctrine applies, according to the Supreme Court, "where a device is so far changed in principle from a patented article that it performs the same or similar function in a substantially different way, but nevertheless falls within the

154. Strandburg, *supra* note 83.

155. 35 USC § 287(c) (1999).

156. Lab. Corp. of Am. Holdings v. Metabolite Laboratories, Inc., 548 U.S. 124 (2006) (writ of certiorari dismissed as improvidently granted in case involving patentability of broad claims to medical diagnostic tests); Prometheus Laboratories, Inc. v. Mayo Collaborative Services, 581 F.3d 1336 (Fed. Cir. 2009) (finding broad claims to medical diagnostic tests patentable) *cert. granted, judgment vacated*, 130 S. Ct. 3543 (2010).

157. See, e.g., BURK & LEMLEY, *supra* note 1; Timothy R. Holbrook, *Equivalency and Patent Law's Possession Paradox*, 23 HARV. J. LAW & TECH. 1, 12–15 (2009); Michael A. Carrier, *Cabining Intellectual Property Through a Property Paradigm*, 54 DUKE L. J. 1, 118–19 (2004); Mark A. Lemley, *The Economics of Improvement in Intellectual Property Law*, 75 TEX. L. REV. 989, 1010–13 (1997); Merges & Nelson, *supra* note 138, at 856–66.

158. DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc., 567 F.3d 1314, 1338 (Fed. Cir. 2009).

159. See Samuelson, *supra* note 4.

literal words of the claim.”¹⁶⁰ Simply reading this description within the context of modern patent law is enough to explain why the defense is never successful. It has the ring of a remnant of a historical central claiming regime in which it made sense to invoke the “principle” of an invention.¹⁶¹ In its current form it makes little sense in a peripheral claiming regime. Moreover, the doctrine is described in terms that are unmoored from any innovation policy goal and will certainly seem obscure to any jury tasked with applying it (the “unreversed” doctrine of equivalents is bad enough in that respect).¹⁶²

Finally, depending on how an expanded reverse doctrine of equivalents was defined, even a beefed up form of this defense could be substantially under- and overinclusive: Why apply it only when the accused infringing product or process “performs the same or similar function” or when there is a “fundamental change in the basic principle by which the device operates”?¹⁶³ And do we really want to exempt infringement even in cases in which the infringer copied and there was no reason to expect bargaining breakdown? Suppose, for example, that the initial patentee offers a standard nonexclusive license to all comers. These cases may warrant exemption if the new invention is a big enough advance, but in its present form, the reverse doctrine of equivalents does not account for these factors at all.

In sum, while the impetus to revive the reverse doctrine of equivalents is a sound one, accounting for the size of an improvement in a multi-factored fair-use-type test is likely both to reflect the underlying policy goals more accurately and to be more palatable to decision makers. Similar problems arise when considering the potential for patent misuse to play an important role as an ex post policy lever, as Burk and Lemley acknowledge.¹⁶⁴

B. Proposals to Deal with Independent Invention

A number of legal commentators have proposed exempting independent inventors from infringement liability.¹⁶⁵ As discussed above, there are several policy reasons to favor such a proposal, given the importance of independent invention and the growing difficulty, at least in some technological arenas, of performing cost-effective patent clearances.

In a response to a thoughtful analysis and proposal by Samson Vermont,¹⁶⁶ however, Mark Lemley has argued that an independent inventor defense might be very strong medicine indeed, given the historical prevalence of nearly

160. *Graver Tank & Mfg. Co., Inc. v. Linde Air Prod. Co.*, 339 U.S. 605, 608–09 (1950) (emphasis added).

161. BURK & LEMLEY, *supra* note 20, at 1773–74 (describing how the reverse doctrine of equivalents originated in a central claiming regime).

162. *See* Jeffrey A. Lefstin, *supra* note 23, at 1141, n.23 (making a similar point).

163. *DePuy Spine*, 567 F.3d at 1338.

164. BURK & LEMLEY, *supra* note 1.

165. *See, e.g.*, references *supra* note 136.

166. Vermont, *supra* note 136.

simultaneous invention.¹⁶⁷ Though this is not necessarily reason not to enact such a defense (if the defense is warranted, the prevalence of independent invention also suggests a very large social payoff from enacting it), it does give one pause. Moreover, as Lemley also argues, there may be special concerns about an independent inventor defense in particular arenas (Lemley mentions pharmaceuticals) involving high costs and high expected payoffs.¹⁶⁸ Lemley suggests four approaches, short of an independent invention defense, to address some of the problems posed by infringement liability for independent inventors: (i) requiring copying as an element of willful infringement; (ii) expanding prior user rights beyond business methods (as Congress recently did); (iii) using nearly simultaneous invention as a secondary indication of obviousness; and (iv) taking account of independent invention in evaluating whether to award injunctive relief.¹⁶⁹

These are all sensible suggestions for stopping short of a bright line independent inventor defense. Incorporating the questions of copying and independent invention into a fair-use-like exemption from infringement liability similarly would add flexibility and be less drastic than an across-the-board independent invention defense (and, if fair use can be accompanied by an obligation to pay royalties, might be very similar indeed to the suggestion regarding injunctive relief). A fair-use-type exemption has at least two types of advantages over Lemley's proposals.

First, rather than simply scaling back liability when there is independent invention, it permits courts to tailor the exemption in light of the technology involved and other relevant factors. Second, and I think importantly, a fair-use-type defense could handle a point that is not much discussed in the independent invention analyses. The world of potential infringers is not simply divided into copyists and independent inventors. There are degrees of copying and independent invention. There are those who copy from an unmarked (but patented) product and those who copy slavishly from the patent itself. There are those who are "inspired" by the patent, but produce radical improvements. There are independent inventors who willfully turn their eyes away from clearly relevant patent literature and those who would have to make large investments to determine whether they are infringing another's patent. Further, there is a whole gray area of other potential infringers: those who copy from an independent

167. Lemley, *supra* note 137, at 1528.

168. Lemley, *supra* note 137, at 1529. He also argues that an independent inventor defense might make it more difficult to have a workable market for patent rights. *Id.* at 1531–32. This argument applies to virtually any ex post policy lever. However, like Vermont in his reply to Lemley's critique, *supra* note 137, at 1539–40, I think this argument is not particularly strong, given the many degrees of uncertainty already plaguing the definition of patent rights. Moreover, if the copyright context is at all analogous, it gives cause for hope since the market for copyrighted works seems to have survived the ex ante uncertainties of the fair use defense.

169. Lemley, *supra* note 137, at 1532–35.

inventor, those who copy from a copyist, and so forth. Taking copying and independent invention into account as factors in a fair-use-type analysis permits a more nuanced (and less difficult to implement) response to these various factual scenarios, providing policy levers that can take into account differences between technologies and other contextual factors.

IV. PATENT FAIR USE 2.0: A PROPOSAL

Given the reasons to favor a fair-use-like patent infringement exemption, what should it look like? As with copyright's fair use, there is a tension between providing flexibility and giving patentees, potential fair users, and courts sufficient clarity of implementation. While O'Rourke's proposal is an excellent jumping-off point, I have argued elsewhere that it may be quite difficult for courts to implement.¹⁷⁰ In particular, factors (iii) ("the nature and strength of the market failure that prevents a license from being concluded") and (iv) ("the impact of the use on the patentee's incentives and overall social welfare")¹⁷¹ are little more than directions to grant fair use where it would be socially desirable to do so. Necessarily, O'Rourke's proposal also fails to incorporate factors whose relevance has only become apparent during the past ten years. Can we do better? Though it is an inherently difficult task, I think so. In particular, developments over the past ten years may allow us to be more specific about some of the factors that should be considered.

To come up with a list of relevant factors, it is helpful to back up and categorize the circumstances under which exemption from infringement may be appropriate. Because of the strength of the arguments for exempting independent inventors from liability, I begin by dividing the analysis between factors that should be relevant whether or not the infringer has copied from the patentee and factors that are relevant only when there is no copying. This is also a useful division because the analogy to copyright fair use is most relevant in situations involving copying. Since independent inventors (and others who have not copied from the patentee) have a stronger case for exemption than copyists do, any factors that might weigh in favor of exempting a copyist should weigh in favor of exempting an independent inventor as well. The next section discusses such factors. After considering factors that would be relevant even when there has been copying, I turn to consider factors that will be relevant only when an alleged infringer has not copied from the patentee.

A. Fair Use Even for Knowing Copyists

There are three types of analytically distinct (though possibly overlapping) situations in which an infringement exemption might be socially desirable even

170. See Strandburg, *supra* note 79.

171. O'Rourke, *supra* note 7, at 1206–07.

when an infringer has copied from the patentee. First, there are situations involving excusable licensing failure. Second, there are situations involving large improvements (analogous to “transformative uses” in copyright fair use). Third, there are situations in which patent incentives are not needed (or, more precisely, where the boost to invention resulting from patent incentives is not worth the trade-off in exclusivity). Each type of situation suggests factors to consider in a fair-use-type approach.

1. *Excusable Licensing Failures*

The category of excusable licensing failures has a large overlap with the types of concerns motivating at least some understandings of copyright fair use.¹⁷² Three sub-categories are useful in the analysis: underserved markets, what O’Rourke calls “anti-patent” refusals to license,¹⁷³ and “anticommons”-type holdups in relation to complex products or processes.¹⁷⁴

a. Underserved Markets

Under-served markets can arise either because potential users are unable to pay the patented price or because the transaction costs of licensing exceed the value of use. The most noted example of underserved markets in patent law involves patented pharmaceuticals.¹⁷⁵ It is evident that there are large numbers of individuals in developing countries who would benefit from lifesaving drugs yet are unable to pay the going rate. Arguably, generic companies could manufacture and sell inexpensive drugs to these underserved markets without undercutting the pharmaceutical companies’ profits from patented medicines in developed countries. In considering whether a fair use exemption should apply, courts should look for situations involving high social value and low ability to pay. In some cases the distinction between commercial and noncommercial use is a reasonable proxy for ability to pay (and would weigh in favor of exempting educational and nonprofit research uses, for example).

The pharmaceutical example points up a dilemma often posed by the possibility of fair-use-type exemptions for underserved markets, however. While the social value of providing lifesaving medicines to those who cannot afford them is extremely high, the potential for arbitrage—leakage of cheap goods back into the market for those who can pay—weighs against the benefit of providing

172. See Wendy J. Gordon, *Fair Use as Market Failure, A Structural and Economic Analysis of the Betamax Case and Its Predecessors*, 82 COLUM. L. REV. 1600, 1601–02 (1982).

173. O’Rourke, *supra* note 7, at 1199.

174. See Heller & Eisenberg, *supra* note 24.

175. See, e.g., Kevin Outterson, *Patent Buy-Outs for Global Disease Innovations for Low- and Middle-Income Countries*, 32 AM. J.L. & MED. 159 (2006); Graham Dutfield, *Delivering Drugs to the Poor: Will the TRIPS Amendment Help?*, 34 AM. J.L. & MED. 107 (2008).

lower-priced drugs only to those who cannot afford the going rate.¹⁷⁶ If such gray market goods undermine drug inventors' ability to recoup their investment, future innovation might be in danger. This possibility clearly must play a role in weighing whether to allow an exemption for the purpose of serving those who lack ability to pay.

In the pharmaceutical example, a generic manufacturer is needed to give those in developing countries access to the patented technology. In this respect it differs from the personal use paradigm, which commonly dominates thinking about fair use as a response to underserved markets in copyright.¹⁷⁷ For personal use, the concern is less about ability to pay than about prohibitive transaction costs associated with licensing. Increasingly, as discussed above, consumers have the potential to infringe patents directly, without the mediation of a manufacturer. In situations where there is no easy way to purchase an embodiment or a standard license to a patented invention, transaction costs may make licensing ineffective. Such situations weigh in favor of a fair use exemption. Exempting personal use would even be in line with the Federal Circuit's recent narrow reading of the experimental use exemption as extending to uses "for amusement, to satisfy idle curiosity, or for strictly philosophical inquiry"¹⁷⁸ and could be quite effective in protecting user innovators whose customizations might stray beyond "repair" and into "reconstruction."

Factors to consider in determining whether an exemption should be made for an underserved market should thus include whether the use was commercial or noncommercial, the likely danger to the patentee's markets due to arbitrage, and the availability of low-transaction-cost means to obtain embodiments of or licenses to the patented technology that would obviate the need for unauthorized activity.

b. "Anti-Patent" Refusals to License

In the copyright context, fair use is often employed to facilitate criticism, parody, and other uses of copyrighted material to which a copyright owner objects not out of a desire to control the market for the patented invention but out of a desire to suppress a socially desirable activity that might undermine (rather than compete in) the patentee's market.¹⁷⁹ These fair uses often implicate First

176. See, e.g., Michael Ilg, *Market Competition in Aid of Humanitarian Concern: Reconsidering Pharmaceutical Drug Patents*, 9 CHI.-KENT J. INTELL. PROP. 149 (2010); Peter Lee, *Toward a Distributive Commons in Patent Law*, 2009 WIS. L. REV. 917 (2009).

177. A similar concern does arise with respect to potential fair use of copyrighted textbooks in developing countries. See Margaret Chon, *Intellectual Property "from Below": Copyright and Capability for Education*, 40 U.C. DAVIS L. REV. 803 (2007).

178. *Madey v. Duke Univ.*, 307 F.3d 1351, 1362 (Fed. Cir. 2002) (citing *Embrex, Inc. v. Service Engineering Corp.*, 216 F.3d 1343, 1349 (Fed. Cir. 2000)).

179. See, e.g., Gordon, *supra* note 172; O'Rourke, *supra* note 7, at 1207; Samuelson, *supra* note 4.

Amendment concerns, which generally are not salient in the patent context.¹⁸⁰ Nonetheless, similar concerns underlie arguments for a research exemption applied to “experimenting on” a patented invention to understand, design around, or improve upon it.¹⁸¹ O’Rourke also identifies refusals to permit reverse engineering to develop compatible products as similarly intended to subvert the limitations of the patent right by extending a patentee’s control to markets for complementary goods.¹⁸² Refusals to license substantial improvements as a means to hold up the improver for higher royalties also fit into a category of “anti-patent” refusals to license.

c. Holdup Due to “Anticommons”-Type Issues

As O’Rourke and many others have pointed out, patent licensing may fail because of “anticommons” issues, in which negotiations over licensing are complicated by a need to assemble large numbers of licenses to produce a particular product or implement a particular process.¹⁸³ At the time of O’Rourke’s writing, concern about the anticommons problem focused on biotechnology and gene patenting.¹⁸⁴ In the past ten years, however, it has become evident that major anticommons issues arise in the information technology arena.¹⁸⁵ While these issues can sometimes be resolved by forming patent pools (in which a number of industry players are granted cross-licenses to one another’s patented technology),¹⁸⁶ patent pools are actually rather rare.¹⁸⁷ Moreover, these problems are exacerbated where, as is often the case in the information technology sector, some patents are held by nonpracticing entities that have no interest in cross-licensing.¹⁸⁸

At least some Supreme Court justices recognized this issue when deciding the *eBay* case, discussed above.¹⁸⁹ While the factors set out in *eBay* to guide courts’ discretion in awarding injunctive relief are not tailored to innovation concerns,

180. See, e.g., Samuelson, *supra* note 4, at 2546–68.

181. See, e.g., Eisenberg, *supra* note 79; Strandburg, *supra* note 73.

182. O’Rourke, *supra* note 7 at 1227–30.

183. *Id.* at 1179–80. See also Heller & Eisenberg, *supra* note 24; Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991 (2007).

184. Heller and Eisenberg, *supra* note 24.

185. See, e.g., Lemley & Shapiro, *supra* note 183; Sapna Kumar & Arti Rai, *Synthetic Biology: The Intellectual Property Puzzle*, 85 TEX. L. REV. 1745, 1756–57 (2007).

186. See, e.g., Ed Levy et al., *Patent Pools and Genomics: Navigating a Course to Open Science?*, 16 B.U.J. SCI. & TECH. L. 75 (2010); Carl Shapiro, *Navigating the Patent Thicket: Cross-Licenses, Patent Pools, and Standard Setting*, in 1 INNOVATION POLICY AND THE ECONOMY 118, 120 (Adam Jaffe, Josh Lerner, & Scott Stern eds., 2001).

187. For a recent survey of patent pools, see David Serafino, *Survey of Patent Pools Demonstrates Variety of Purposes and Management Structures*, KNOWLEDGE, ECOLOGY, INT’L (June 4, 2007), <http://www.keionline.org/misc-docs/ds-patentpools.pdf>. See also Merges, *supra* note 18, at 1355.

188. See, e.g., Lemley & Shapiro, *supra* note 183, at 2015.

189. *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 395–97 (2006) (Kennedy, J., concurring).

courts have in fact employed them to deny injunctions and impose ongoing royalties primarily in cases involving nonpracticing entities, as discussed by Burk and Lemley.¹⁹⁰

Though *eBay v. MercExchange* has alleviated concerns about holdup from “patent trolls,” the danger that courts may not have their eyes on innovation policy and may simply turn the “injunction always” rule into a “no injunctions for nonpracticing entities” rule remains. Thus, for example, whether the infringer is a copyst or an independent inventor and the extent of the inventive contributions of patentee and infringer arguably should play a role in determining whether injunctive relief is warranted and whether a royalty should be imposed in a potential anticommons scenario. An independent inventor will be particularly subject to holdup if he or she has made a substantial investment in producing a complex product incorporating a patented invention. Such an inventor may have been unable, as a practical matter, to have negotiated a license before making the investment. Conversely, a company that knowingly copies highly innovative technology from a nonpracticing entity is probably not a victim of licensing failure. These considerations might be squeezed into the “balance of hardships” and “public interest” prongs of the *eBay* analysis,¹⁹¹ but a fair-use-type analysis would accommodate innovation-related concerns much more cleanly.

2. *Substantial Improvements*

Copyright fair use doctrine relies heavily on the extent to which a particular use is “transformative.”¹⁹² The motivation behind this reliance is the intuition that the public should not be deprived of a major advance because the initial author refuses to “play along.” The argument is similar in the patent law context and is the basis for the reverse doctrine of equivalents already discussed at length. In the patent context, the evaluation of the substantiality of the improvement should also take into account the size of the technological contribution of the initial innovator. It is longstanding patent doctrine that a “pioneer” inventor should be afforded a broad scope of equivalents in assessing infringement.¹⁹³ That doctrine, like the reverse doctrine of equivalents, had its roots in central claiming and is somewhat difficult to apply under the present peripheral claiming system.¹⁹⁴ It can be quite sensibly taken into account in a fair-use-type analysis, however, where the relative sizes of the initial invention and improvement are relevant to how the returns from the invention should be divided and indicative of whether there is likely to be a hold-up problem or licensing breakdown.

There is one major difference between patent law and copyright law that

190. BURK & LEMLEY, *supra* note 1. *See also* Streur, *supra* note 89, at 67.

191. *eBay*, 547 U.S. at 391–94.

192. *See, e.g.*, Samuelson, *supra* note 4, at 2619.

193. *See, e.g.*, Burk & Lemley, *supra* note 20, at 1746 n.13.

194. *Id.*

would seem to obviate the need for a fair-use-type exemption for improvers except in the most extreme circumstances (where one might suspect a bargaining breakdown due to holdup). Unlike authors (who are not permitted *ex ante* to obtain copyright in unauthorized transformative works),¹⁹⁵ improvers on patented technology can proceed without authorization and are specifically permitted to obtain patents on their improvements.¹⁹⁶ This “blocking patent” doctrine is assumed to result in the salutary situation in which it is in both parties’ interests to come to terms, cross license their patents, and proceed to make use of the improved technology. The expectation that this will ordinarily occur is probably behind the present, rather dusty, status of the reverse doctrine of equivalents. Unless there is some reason to think that initial and follow-on inventors cannot come to terms, why confer a fair use defense on the improver? Thus, a likelihood of “blocking patent failure” would strongly increase the force of an argument for an exemption for a substantial improver.

While O’Rourke argues that fair use analysis should consider the possibility of blocking patent failure due to difficulties of valuation, especially where there is potential for holdup due to large disparities in the values of the contributions made by initial and follow-on inventors,¹⁹⁷ recent developments provide much stronger reasons to anticipate that the blocking patent doctrine may not be sufficient to protect the substantial improver. First, the blocking patent doctrine assumes that the improver is able and willing to patent the improvement. As discussed above, this may not be the case for many of those involved in new innovation paradigms. User innovators may not have the resources to patent their improvements or may belong to communities in which free revealing rather than patenting is the norm.¹⁹⁸ Open source software developers may have nonpecuniary motivations that preclude (and would be dampened by) applying for patents.¹⁹⁹ In many cases in which a widespread group of contributors undertakes highly cumulative innovation, patent protection is simply unavailable either in principle or as a practical matter.

If patenting is inconsistent with the innovation paradigm that produces the improvement, the blocking patent doctrine breaks down. Assuming the improvement is disclosed, as it often will be under new innovation paradigms, the initial inventor can freely use the improvement, while retaining the right to sue the improver for patent infringement. In such circumstances, the initial inventor has no reason to come to terms—even if the improvement is a major advance. Fair

195. 17 U.S.C. § 103(a) (2010).

196. 35 U.S.C. § 101 (2010).

197. O’Rourke, *supra* note 7, at 1204.

198. *See sources, supra* note 114, and references therein.

199. *See, e.g.,* Karim Lakhani & Robert G. Wolf, *Why Hackers Do What They Do: Understanding Motivation and Effort in Free/Open Source Software Projects* (MIT Sloan Sch. of Mgmt., Working Paper No. 4425-03 2003), available at <http://ssrn.com/abstract=443040>.

use for the improver may be a socially desirable means to solve this breakdown.

Second, the blocking patent doctrine is less effective where the “improver” is an independent inventor and/or the initial inventor is a nonpracticing entity. Having invested heavily in marketing a product or using a process that is only later determined to infringe an earlier patent, the substantial improver may be subject to holdup issues similar to those discussed in Section IV(a)(1)(c) above. Additionally, if the initial patentee is not locked by up-front investment into using the improvement (or never intends to practice either patent), the improver again may be subject to holdup.

3. *Alternative Innovation Paradigms*

As I have argued elsewhere in the context of user innovation,²⁰⁰ the availability of non-patent-motivated innovation paradigms for a particular technology weakens the argument for patent exclusivity because it changes the cost-benefit tradeoffs. Thus, if user innovation (or some other non-patent-based paradigm) predominates either in a particular case or in the field of the invention that fact should weigh in favor of an infringement exemption. The extent to which an exemption should be favored also depends on the extent to which the alternative innovation paradigm leads to disclosure and dissemination of inventions. Open source software, for example, is non-patent-motivated, widely disclosed, and widely disseminated. The prevalence of open source approaches in a particular technological area weighs in favor of an infringement exemption. User innovation is frequently non-patent-motivated, but whether it is widely disclosed and disseminated will depend on whether the invention is self-disclosing or could be kept as a trade secret, whether it can be easily “picked up” by other users once disclosed, whether there are norms of free revealing among a particular group of users and so forth. In a fair-use-type approach, the availability and nature of alternative innovation paradigms should factor into determining whether an infringement exemption is appropriate.

B. Fair Use for Independent Inventors, Other Noncopyists, and “Innocent” Copyists

When an accused infringer is an independent inventor or other noncopyist, there are additional factors that could weigh in favor of an infringement exemption. First, as already discussed,²⁰¹ the fact of independent invention itself weighs in favor of an exemption. As noted, however, noncopyists are not all alike and neither are copyists. To avoid some of the potential for overreaching of a strict independent inventor defense (and to deal with other noncopyists and with “innocent” copyists who copy without knowledge of the patent), one should

200. Strandburg, *Users as Innovators*, *supra* note 29.

201. See discussion text accompanying notes 133–40, *supra*.

consider the circumstances of any infringement that occurs without knowledge of the patent.

Besides considering whether the infringer is an independent inventor, it is also sensible to consider to what extent the infringer's ignorance of the patent was reasonable under the circumstances. Relevant circumstances would include patent search costs (which will depend upon the technological area, as discussed above), custom within a particular industry (which may be evidence of search costs or of norms of reciprocal forbearance), the extent to which the infringer should have been able to foresee the possibility of infringing the patent at issue (which may be related to the fuzziness of claim boundaries), and the extent to which a particular infringer could reasonably be expected to have the sophistication and funds to undertake the necessary patent search (which may be related to whether the infringer is a commercial or nonprofit entity or a small entity or individual). Consideration of context is important to avoid encouraging "head in the sand" behavior by potential infringers and to determine whether an infringement exemption is appropriate for those who are neither knowing copyists nor true independent inventors.

C. Summary of Patent Fair Use 2.0 Proposal

The above analysis leads to the following proposed factors for courts to consider in determining whether to award an infringement exemption (or alternatively to refrain from awarding an injunction and impose an ongoing royalty):

1. Is there a justifiable failure to purchase or license due to:
 - a. The social value of making the invention available to a market that the patentee will not be able to serve, such as those who are unable to pay or those for whom the transaction costs of licensing are prohibitive (taking into account the potential damage to the patentee's interests by arbitrage);
 - b. An "anti-patent" license failure due to the patentee's attempt to squelch further innovation or to exert control over markets beyond the scope of the claims; or
 - c. A failure to license due to anticommons-type holdup?
2. Did the infringer make a substantial improvement over the patentee's invention and was there some reason for blocking patent failure?
3. Does the availability of alternative innovation paradigms in the technological arena provide evidence of reduced importance of patent incentives?
4. Was the infringer a knowing copyist, independent inventor, or something in between? If the infringer was not a knowing copyist, was her failure to locate the patent through search reasonable in light of patent search costs in the particular technology, custom in

the industry, the foreseeability of infringement, and the infringer's commercial, noncommercial, or small entity status?

D. Applications

To breathe some life into the proposed fair use 2.0 analysis, this section briefly discusses two possible applications: open source software and essential medicines.

1. Open Source Software

There has been considerable concern about the vulnerability of open source software to patent infringement liability, which could arise either as a result of independent invention or because one of a myriad of widely distributed contributors inserts infringing code into an open source project.²⁰² Under current law, there is no likely defense to such a claim²⁰³ and while the *eBay v. MercExchange* approach might undercut a request for injunctive relief from a nonpracticing entity, it is not at all clear that courts would refuse to enjoin an open source program if a software company marketing a competing product were to sue. On the other hand, applying the fair-use-type factors proposed here would exempt open source software in most cases, as follows:

1) *Is there a justifiable failure to purchase or license?*

This factor may not weigh strongly in favor of open source software that infringes patents held by companies marketing competing products, though the fact that open source software is available to everyone at no charge is somewhat favorable. Of course, in particular cases, this factor may have more weight.

2) *Did the infringer make a substantial improvement over the patentee's invention and was there some reason for blocking patent failure?*

The analysis of this factor will depend upon the extent to which the open source software is innovative beyond the patentee's claims. If there is a substantial improvement, this factor is strongly in favor of an exemption for the open source software since the inability of the open source community to patent its

202. See, e.g., Ronald J. Mann, *Commercializing Open Source Software: Do Property Rights Still Matter?*, 20 HARV. J.L. & TECH. 1, 37 (2006) (raising this question and discussing it in the context of litigation in which SCO Group sued IBM, contending that Linux contained some lines of proprietary code); Joe Mutschelknaus, *Spillover Effect: Investigating Patent Implications to Open-Source Software Copyright Licensing*, 19 FED. CIR. B.J. 409 (2009–10) (discussing how the GPL attempts to deal with patent issues); John Tsai, *For Better or Worse: Introducing the GNU General Public License Version 3*, 23 BERKELEY TECH. L.J. 547 (2008); Greg Vetter, *The Collaborative Integrity of Open-Source Software*, 2004 UTAH L. REV. 563, 593 (2004).

203. Though some have suggested that an infringement exemption for open source software be considered. See, e.g., Garrison, *supra* note 140.

improvements leads to a complete blocking patent failure.

3) *Does the availability of alternative innovation paradigms in the technological arena provide evidence of reduced importance of patent incentives?*

This factor will generally weigh strongly in favor of exempting the open source software unless there is evidence that open source is not playing an important role in innovation in the particular arena.

4) *Was the infringer a knowing copyist, independent inventor, or something in between? If the infringer was not a knowing copyist, was her failure to locate the patent through search reasonable?*

This factor will probably favor exemption since the open source community likely invented independently. Even if a contributor knowingly contributed patented code, it may be unreasonable to expect the core developers to police such infringement.²⁰⁴ Moreover, it would in most cases be unreasonable to expect participants in an emergent and modular innovation paradigm such as open source software to conduct patent searches and attempt patent clearance. As already discussed, the information technology arena is one in which even commercial players have found it prohibitively difficult to conduct patent searches.

The proposed fair use-type exemption thus would probably apply to most open source projects. Adopting such an exemption would therefore remove the shadow of potential infringement liability from such projects. Note, however, that the exemption would not be automatic. If an open source project blatantly and knowingly copied patented code, encouraged its contributors to ignore patents when making their contributions, and so forth, it would not be eligible for the exemption. The proposal thus has advantages over a bright line “open source” defense.²⁰⁵

2. *Essential Medicines*

The problem of access to medicine is hugely important in the international arena and has inspired a correspondingly vast literature.²⁰⁶ Here I do not attempt to engage that literature seriously. This analysis simply illustrates how the proposed factors would apply in the context of a domestic patent infringement case against a very low cost provider of essential medicines to those with very low

204. The issues here would be comparable to those that arise in considering the liability of internet service providers for infringement, an issue dealt with in the copyright context by “safe harbor” provisions. 17 U.S.C. § 512 (2010).

205. See Garrison, *supra* note 140.

206. See, for a small taste, Symposium, *Global Access to Health: Legal, Business, and Policy Obstacles*, 34 AM. J.L. & MED. 97 (2008); Cynthia M. Ho, *Unveiling Competing Patent Perspectives*, 46 HOUS. L. REV. 1047 (2009); James Love & Tim Hubbard, *Prizes for Innovation of New Medicines and Vaccines*, 18 ANNALS HEALTH L. 155 (2009).

incomes. I will assume in this discussion that the infringer is a nonprofit entity and consider whether there might be workable models for tailoring provision of essential medicines so as to qualify for a “patent fair use” exemption.

1) *Is there a justifiable failure to purchase or license?*

Where patients are in need of essential medicines and unable to afford them, there is a very strong social benefit to providing those medicines. The rub, of course, is the arbitrage problem, in which medications supplied or produced for use by low income patients might be redirected “under the table” to higher income patients. Rather than simply assume in the abstract that gray market goods are a problem, an ex post fair-use-type analysis would permit a factual investigation of whether the institutional arrangements for providing a particular infringing drug were in fact creating a sizable opportunity for arbitrage. So, for example, if generic essential medications were administered at clinics operated by nonprofit entities with reasonably strict standards for patient income, rather than provided directly to patients for use at home, or were prepared in some way to differentiate them from brand name drugs so as to discourage corrupt behavior by the provider, these facts would weigh in favor of an exemption.

2) *Did the infringer make a substantial improvement over the patentee’s invention and was there some reason for blocking patent failure?*

This factor would not favor an exemption with respect to patented essential medicines in many circumstances, since the generic would often essentially duplicate the brand name drug. One could imagine cases where this factor might come into play, however. Suppose, for example, that a new use for a brand-name drug in treating an illness endemic to low-income patients was discovered by nonprofit researchers or doctors treating low-income patients. The brand-name company would have had little incentive to develop such a new use, since there is little profit to be made from it. For the same reason, the blocking patent doctrine would be of little help in providing incentives for cross-licensing.

3) *Does the availability of alternative innovation paradigms in the technological arena provide evidence of reduced importance of patent incentives?*

This factor will generally weigh strongly against infringement exemptions in the pharmaceutical arena since pharmaceutical innovation is strongly dependent on very expensive private investment, at least under the current regulatory system. This might conceivably change in the future, since various experiments with “open source drug development” are underway.²⁰⁷ However, the costs of clinical trials for approval of new drugs are likely to constrain the potential for such open

207. See, e.g., Marden, *supra* note 111. See also BIOENDEAVOR: ENABLING OPEN INNOVATION IN THE LIFE SCIENCES, <http://www.bioendeavor.net> (last visited Sept. 28, 2011).

source approaches, at least within the United States.²⁰⁸ Once again, though, the situation might be different at some point with respect to the development of new uses of existing drugs.²⁰⁹

4) *Was the infringer a knowing copyist, independent inventor, or something in between? If the infringer was not a knowing copyist, was her failure to locate the patent through search reasonable?*

This factor will typically weigh against an exemption, since we are postulating the use of a known, patented drug. At least with respect to patents on the chemical entity, search is generally not a serious problem for pharmaceuticals.²¹⁰

The bottom line of such an analysis will probably favor the patentee most of the time. But the analysis suggests room for creativity on the part of organizations seeking to serve those who are unable to pay for essential medicines because the analysis is sensitive to the facts on the ground with respect to the issue of gray market goods. A fair-use approach thus might provide a path out of the stalemate caused by attempts to balance the value of essential medicines to those who cannot afford them against the value of as-yet-uninvented future medicines.

V. CONCLUSIONS

This Article has attempted to update the inquiry into the wisdom of “patent fair use” to account for the evolution of technology and of inventive paradigms in the years since O’Rourke’s seminal treatment of the issue in 2000. I have argued that a fair-use-type ex post approach to cabining patent exclusivity is even more attractive as a theoretical matter now than it was in 2000. I have also suggested a set of “patent fair use 2.0” factors that would be relevant to such an exemption:

208. See, e.g., Marden, *supra* note 111, at 234 (discussing the high costs of drug development). Some have also proposed shifting responsibility for clinical trials away from the private sector. See, e.g., Dean Baker, *The Benefits and Savings of Publicly-Funded Clinical Trials of Prescription Drugs* (2008), available at <http://www.cepr.net/index.php/publications/reports/the-benefits-and-savings-of-publicly-funded-clinical-trials-of-prescription-drugs> (last visited Sept. 28, 2011); Arjun Jayadev & Joseph Stiglitz, *Two Ideas to Increase Innovation and Reduce Pharmaceutical Costs and Prices*, HEALTH AFFAIRS 28, Web Exclusive (2008): w165-w168, available at <http://content.healthaffairs.org/cgi/reprint/hlthaff.28.1.w165v1.pdf> (last visited Sept. 28, 2011); Amy Kapczynski, *Innovation Policy for a New Era*, 37 J.L. MED. & ETHICS 264 (2009); Tracy R. Lewis, Jerome H. Reichman & Anthony D. So, *The Case for Public Funding and Public Oversight of Clinical Trials*, ECONOMISTS’ VOICE 4, no. 1 (2007), 1–4, available at <http://www.bepress.com/cgi/viewcontent.cgi?article=1123&context=ev> (last visited Sept. 28, 2011). Any major changes in the regulatory paradigm could affect the viability of open and collaborative innovation approaches to pharmaceutical innovation, as could major scientific or technical advances that reduced the costs.

209. See, e.g., Curtis R. Chong & David J. Sullivan, *New Uses for Old Drugs*, 448 NATURE 645 (2007) (describing the Johns Hopkins Clinical Compound Screening Initiative); Harold J. DeMonaco, Ayfer Ali, & Eric von Hippel, *The Major Role of Clinicians in the Discovery of Off-Label Drug Therapies*, 26 PHARMACOTHERAPY 323 (2006); Stephen M. Maurer, *Open Source Drug Discovery: Finding a Niche (Or Maybe Several)*, 76 UMKC L. REV. 405 (2007).

210. BESSEN & MEURER, *supra* note 18.

(1) Is there a justifiable failure to purchase or license due to the social value of serving an underserved market (taking into account the potential damage to the patentee's interests by arbitrage), "anti-patent" license failure due to the patentee's attempt to squelch further innovation or to exert control over markets beyond the scope of the patent, or failure to license due to anticommons-type holdup? (2) Did the infringer make a substantial improvement over the patentee's invention and was there some reason for blocking patent failure? (3) Does the availability of alternative innovation paradigms in the technological arena provide evidence of reduced importance of patent incentives? (4) Was the infringer a knowing copyist, independent inventor, or something in between? If the infringer was not a knowing copyist was her failure to locate the patent through search reasonable in light of patent search costs in the particular technology, custom in the industry, the foreseeability of infringement, and the infringer's commercial, noncommercial, or small entity status?

While this Article has been primarily in the nature of a thought experiment about optimal doctrine, it is obviously important to consider whether any of this is at all practical. Could the judiciary implement a fair-use-type exemption? The fair use exemption in copyright, though later codified, began in just that way,²¹¹ as did the limits on patentable subject matter in patent law,²¹² which arise from similar policy concerns. So it might be possible in principle for judges to make such a move. At this point, however, a wholesale move to a fair-use-type exemption by the judiciary seems highly unlikely. A statutory fair-use-type exemption is perhaps more likely, but only just so. Failing that, what can we hope to obtain from a discussion such as this one? First, the law regarding the award of injunctions under the *eBay* decision is only beginning to develop. The analysis here could inform how courts interpret the "balance of hardships" and "public interest" prongs of the test. Second, there will continue to be proposals for, and occasional enactment of, more limited exemptions in various contexts. While limited exemptions may not be optimal, the factors here can provide guidance both in evaluating the need for a particular limited exemption and in designing its implementation. For example, the analysis suggests how one might design an independent inventor-type exemption that might avoid some of the over- and under coverage of a bright line rule. Finally, a conversation about the analytical basis for infringement exemptions can help to illuminate commonalities among proposals for specific exemptions, as in the example of business methods and research tools discussed above.

211. See, e.g., *Harper & Row Publishers, Inc. v. Nation Enterprises*, 471 U.S. 539, 547 (1985) (articulating that 17 § U.S.C. 107 codifies the traditional "fair use" privilege).

212. See, e.g., *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980) (citing the history of the ban on patent "laws of nature, physical phenomena, and abstract ideas").