



School of Law

THE RECIPROCITY OF SEARCH

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When discussing search in patent law, everyone considers the problem in terms of producers looking for patentees. But search is reciprocal. In designing a patent system, we can have producers look for patentees, or patentees look for producers. Either will result in the ex ante negotiation that is the goal of a property system. The legal rule that produces the most efficient social outcome depends on identifying the party with the lower search cost.

The corollary is that patentees should have the duty of search when they are the lower cost searcher. For example, if there are thousands of patents covering a product, but only one producer in the industry, then it is likely to be more efficient to have patentees find the well-known producer to initiate licensing negotiations, rather than have the producer search for each of thousands of unknown patentees.

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INTRODUCTION

When discussing search in patent law, the discussion always focuses on one particular model of search: producers of commercial products are supposed to identify the patents that their product might infringe, and then negotiate a license from the owners of those patents. This one-sided view of search responsibility is most evident in doctrine. As a doctrinal matter, patent law imposes an absolute duty on the producer of a commercial product to find all relevant patents and obtain licenses from each of the owners before commencing manufacture. Failure to meet this duty is punished by liability for infringement, where ignorance of the patent is no excuse.¹

The one-sided view of search, however, is treated as far more than simply a matter of doctrine (which legislatures or courts might change). Numerous prominent commentators have sharply criticized the current doctrine.² In what has become known as the “patent thicket” literature, these critics argue that producers face excessively high search costs, because a commercial product is often covered by

¹ *In re Seagate Tech., LLC*, 497 F.3d 1360, 1368 (Fed. Cir. 2007) (en banc) (infringement is strict liability offense).

² *See, e.g.*, JAMES BESSEN & MICHAEL J. MEURER, *PATENT FAILURE: HOW JUDGES, BUREAUCRATS, AND LAWYERS PUT INNOVATORS AT RISK* (2008); MICHAEL A. HELLER, *THE GRIDLOCK ECONOMY* 53 (2008); Mark A. Lemley & Philip J. Weiser, *Should Property or Liability Rules Govern Information?*, 85 *Tex. L. Rev* 783, 797 (2007); Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting*, in 1 *INNOVATION POLICY AND THE ECONOMY* 119 (Adam B. Jaffe, Josh Lerner & Scott Stern eds., 2001) *see also* FEDERAL TRADE COMMISSION, *TO PROMOTE INNOVATION: THE PROPER BALANCE OF COMPETITION AND PATENT LAW POLICY* 6 (2003).

thousands of overlapping patents, and finding every last patent is impossible. The irony of this critique is that these critics still adopt a one-sided view of search, in that they only ever examine the costs and difficulties of *producers finding patentees*. Once the critics conclude that this one particular type of search is too expensive, they immediately conclude that all searching is impossible.³

The point of this Article is that search is reciprocal. In designing a patent system, we can require producers to look for patentees, or patentees to look for producers. Either will achieve the goal of an ex ante licensing negotiation that patent search is designed to facilitate. There is no intrinsic reason that patent law must prefer to place the search obligation on one side or the other. The choice is a matter of system design.

Once we appreciate this reciprocity point, it becomes clear that the existing patent search literature has missed half of the equation. There is an extensive literature on whether it is feasible, sensible, and efficient to require producers to look for patentees. There is almost no literature on whether it is feasible, sensible, or efficient to make patentees look for producers.⁴ But unless one considers patentee search costs as well as producer search costs, it is altogether premature to conclude that *all* search is hopeless, as the current literature is wont to do.⁵ The first contribution of this Article is the point that, at a minimum, a discussion of patent search must consider both sides of the equation.

A close analogy to this point is Ronald Coase's famous insight in tort law.⁶ Prior to Coase, the intuitive belief was that causation was one-sided.⁷ That is, when a driver crashes into a pedestrian, people

³ As a consequence, they argue for a liability rule regime that does not require search. See, e.g., Peter Lee, *The Accession Insight and Patent Infringement Remedies*, 110 Mich. L. Rev. (forthcoming 2011) (arguing for judicially imposed compulsory licenses in cases where a producer could not have reasonably found the patentee); Lemley & Weiser, *supra* note 2, at 799–800.

⁴ Jonathan Masur comes close with his recent article, Jonathan Masur, *Patent Liability Rules as Search Rules*, 78 U. Chi. L. Rev. 187 (2011). The difference is that Masur focuses his discussion on patentees searching for infringers after infringement has already occurred, while my focus is on ex ante searches for producers before they begin infringing. As I discuss in Part III.A., this ex ante/ex post difference is crucial, because it is often too late to negotiate a license after infringement has already occurred.

⁵ See *supra* text accompanying note 3.

⁶ R.H. Coase, *The Problem of Social Cost*, 3 J.L. Econ. 1 (1960).

⁷ See Guido Calabresi, *Neologisms Revisited*, 64 Md. L. Rev. 736, 738 (2006) (recounting how the reciprocity point was so counter-intuitive at the

intuitively blame the driver for causing the accident, and therefore focuses on measures to adjust the driver's behavior (*e.g.* by imposing penalties for bad driving). In *The Problem of Social Cost*, Coase made the point that causation is reciprocal: both drivers and pedestrians can take measures to avoid accidents.⁸ Drivers can drive more slowly, and pedestrians can walk more carefully. There was no intrinsic reason for the law to consider *only* measures that would affect driver behavior.

The corollary to the reciprocity insight is that law should place the duty on the party with the lower cost. In tort law, this was Guido Calabresi's famous follow-up to Coase.⁹ Once we appreciate that both drivers and pedestrians can take measures to avoid accidents, Calabresi argued that the duty to take precautions should be allocated on the *least cost avoider*.¹⁰ At a doctrinal level, tort law had already implemented this insight through the doctrine of contributory negligence, which imposes a duty on victims to take precautions when they can do so at the lower cost.¹¹ Calabresi provided the theoretical foundation for explaining the economic function of this doctrine.

In similar vein, the second novel contribution of this Article is the argument that we should allocate the duty of search to the lower cost searcher, and patentees will at least sometimes—indeed, likely very often—be the lower cost searcher. As the existing literature has shown, producers often face extraordinary difficulties finding patentees, because there are often thousands of relevant patents covering a single product, and these thousands of patents are hidden in a thicket of two million issued and unexpired patents.¹² At a first approximation, if there are a small number of well-known producers (*e.g.* a few large companies dominate an industry), while there are thousands of small and unknown patentees, then it would be more efficient to have patentees look for producers, rather than have producers look for patentees.

time that a professor told him it was wrong and made him remove the argument from an article); *see also* Todd S. Aagaard, *Environmental Harms, Use Conflicts, and Neutral Baselines in Environmental Law*, 60 Duke L.J. 1505, 1558 (2011) (“Coase's observation of the reciprocity of causation in land-use conflicts is simple, but it differs dramatically from the traditional and intuitive conceptualization of such conflicts.”).

⁸ Coase, *supra* note 6, at 13 (making the point in the context of a rancher's cattle trampling a farmer's crops).

⁹ GUIDO CALABRESI, *THE COSTS OF ACCIDENTS: A LEGAL AND ECONOMIC ANALYSIS* 135–40 (1970).

¹⁰ *Id.* (creating the concept of the “cheapest cost avoider”).

¹¹ *See* RESTATEMENT OF TORTS § 467 (1939).

¹² Mark A. Lemley & Ragesh K. Tangri, *Ending Patent Law's Willfulness Game*, 18 Berkeley Tech. L.J. 1085, 1117 & n.99 (2003)

If we followed the script of the tort analogy, the doctrinal response would then be to impose a “contributory search” defense. I outline how such a defense would work in Part III. However, a contributory search defense lacks statutory support. Thus, in Part IV I also provide a more practical, though less theoretically perfect, mechanism for reallocating the search burden through 35 U.S.C. § 287. The point is that § 287 on its face requires patentees to give notice to producers,¹³ but courts have interpreted this provision narrowly because it lies in tension with the dominant assumption that producers must find patentees. Giving § 287 a more robust application would thus partially reallocate the search duty from producers to patentees, though not with the same theoretical perfection as a contributory search defense.

This Article proceeds in five Parts. In Part I, I explain how the existing literature and case law reflect a one-sided view of search. In Part II, I point out that search is in fact reciprocal, with the corollary that we should allocate the search duty to the lower cost searcher. In Part III, I describe how this can be implemented through a contributory search defense, akin to how the contributory negligence defense achieves this function in tort law. Because the contributory search defense lacks statutory support, however, Part IV provides an alternative doctrinal mechanism to implement the reciprocity insight, through the existing provisions of 35 U.S.C. § 287. In Part V, I consider how the reciprocity insight might have application outside of patent law, most importantly in the analogous domain of copyrights. A brief conclusion follows.

I. THE ONE-SIDED VIEW OF SEARCH

A. *The Role of Search*

In order to see why the fallacy of one-sided producer search matters, it is helpful to see first why search matters. It is usually taken for granted that having low patent search costs is important and desirable. It is rarely elaborated as to why. The reason goes to the fundamental nature of patents as property rights. A brief discussion of the dichotomy of property rules versus liability rules is therefore required.

As Guido Calabresi and Douglas Melamed explained, property rules and liability rules are alternative ways for the legal system to determine the value of social resources such as land or inventions.¹⁴ A

¹³ See *SEB S.A. v. Montgomery Ward & Co., Inc.*, 594 F.3d 1360, 1378 (Fed. Cir. 2010) (“Under § 287(a) a patentee that sells its patented product within the United States must provide actual or constructive notice of the patent to the accused infringer to qualify for damages.”).

¹⁴ Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules and Inalienability: One View of the Cathedral*, 85 Harv. L. Rev. 1089 (1972).

property rule determines the value of a social resource by forcing the parties to negotiate.¹⁵ In practical terms this is usually achieved by a right to injunctive relief.¹⁶ By giving the owner of Blackacre an absolute right to Blackacre (backed by an injunction against unconsented takings), the law forces anyone who wishes to use Blackacre to negotiate with the owner and pay a mutually agreed price. The market mechanism therefore determines the value of Blackacre.

Search plays an essential role in a property rule regime because, in order for the parties to negotiate, it is obviously necessary that they find each other first.¹⁷ And it is important to note in this respect that property rules require the negotiation to occur *before* the buyer takes the property: if I want to use Blackacre, the expectation is that I would purchase it first, before moving in.¹⁸ This *ex ante* point applies equally to patent law. What patent law seeks to achieve is not a negotiation that occurs *after* the producer has independently developed a product and started infringing—that result is wasteful and inefficient. Rather, the point of patent law is to incentivize a negotiation beforehand, so that an inventor who has a brilliant idea but no capital can team together with a producer who has a comparative advantage in manufacturing and marketing, in order to bring the idea to market and allow both the inventor and the producer to share the profit.¹⁹ Thus, when I speak of “search” in this Article, I mean *ex ante* searches.

Another way to understand the importance of *ex ante* negotiation in a property rule system is to consider what happens if the negotiation occurs *ex post*, after the property rule has already been violated. If I build a house on Blackacre without purchasing it beforehand, and *then*

¹⁵ *Id.* at 1092.

¹⁶ *Id.* at 1127 (noting that property rules are usually supported by injunctions and/or criminal penalties for violation).

¹⁷ *See Id.* (pointing out that we use liability rules for car accidents because drivers and pedestrians cannot find each other ahead of time to negotiate); *see also* Carol M. Rose, *The Shadow of the Cathedral*, 106 *Yale L.J.* 2175, 2184 (1997) (calling this difficulty of “having to find and assemble numerous or indistinctly defined interested parties” a “Type I” transaction cost).

¹⁸ *See* Calabresi & Melamed, *supra* note 14, at 1108 (noting that a property entitlement against accidental injuries would require purchase of the right to injure *before* the accident occurred).

¹⁹ *See* Kenneth J. Arrow, *Economic Welfare and the Allocation of Resources for Invention*, in NAT'L BUREAU OF ECON. RESEARCH, *THE RATE AND DIRECTION OF INVENTIVE ACTIVITY: ECONOMIC AND SOCIAL FACTORS* 609, 614-16 (1962) (noting the “disclosure paradox” that would occur without patent protection, where a manufacturer would not agree to license an idea without knowing what it was buying, but once the idea is disclosed there is no incentive to pay for it).

approach the owner to negotiate, a phenomenon known as “holdup” occurs. Stated simply, holdup is the increased leverage that comes from the fact that the property has been improved and that this improvement cannot be undone.²⁰ *After* I have already built the house, the price that the owner will demand for Blackacre increases, because the land now has a brand new house on it, and the house cannot be moved.²¹ This *ex post* value exceeds the *ex ante* “true” value of Blackacre (*i.e.* of the land and not the house) that a property rule is designed to measure. Similarly, once a producer has made fixed investments in an invention, such as building a factory to commercialize it, the *ex post* value of a license will reflect the value of the factory, and not of the inventive idea by itself.²²

Holdup is usually considered deeply unfair.²³ A more economically oriented way of expressing this unfairness is that it deters productive improvement of property.²⁴ If I must effectively pay for the house (factory) twice—once to build it, and a second time to buy it back from the owner of Blackacre (the patentee)—I am less likely to build the house (commercialize the invention), which is a productive use of Blackacre (the inventive idea).²⁵ Of course, the easy answer is that I should buy Blackacre *before* building a house on it. But it is important to see that this answer requires that the owner and I can find each other ahead of time to negotiate.²⁶ The smooth functioning of a property rule is thus extremely dependant on this type of *ex ante* search being feasible or, in economic terms, cheap.

An alternative way of determining the value of property is not to negotiate for it, but simply have a judge order the transfer at a

²⁰ Benjamin Klein, *Transaction Cost Determinants of “Unfair” Contractual Arrangements*, 70 *Am. Econ. Rev.* 356, 356–57 (1980) (emphasizing the requirement of “highly firm-specific investments”).

²¹ This is not because of the “sunk cost fallacy,” but because the land has been improved.

²² Shapiro, *supra* note 2, at 125 (describing the holdup problem).

²³ See *eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 396 (2006) (Kennedy, J., concurring) (arguing that holdup gives patentees “undue leverage in negotiations” that allow them to “charge exorbitant fees”).

²⁴ Klein, *supra* note 20, at 357 (“For example, one would not build a house on land rented for a short time. After the rental agreement expires, the landowner could raise the rental price to reflect the costs of moving the house to another lot.”).

²⁵ *Id.*

²⁶ See Calabresi & Melamed, *supra* note 14, at 1127 (noting transaction costs, and in particular search costs, as the determinant between property rules and liability rules).

judicially-determined price.²⁷ This alternative is counterintuitive precisely because it turns the notion of “property” on its head, but it is what happens in an eminent domain proceeding.²⁸ The government first unilaterally takes the land and puts a government building on it, and *then* has a judge determine the “just compensation” that must be paid to the original owners.²⁹ This is what Calabresi and Melamed define as a “liability rule” regime.³⁰

A liability rule does not require search because it does not require ex ante negotiation. A judge can determine the true value—*i.e.* the value of Blackacre without the building—in an ex post setting. In this way, liability rules are more efficient in situations where ex ante search costs are very high.³¹ But liability rules also have a downside, which is that they require judges to determine the value of property.³² Courts are not institutionally well-equipped to perform this task, so a judge trying to determine the value of Blackacre, or the value of an invention, will often get it wrong.³³ Indeed, the entire premise of having a patent system is that judges cannot accurately measure the value of inventions: if they could, it would be more efficient to abolish patents completely and award taxpayer-funded cash prizes instead.³⁴ For this

²⁷ *Id.* at 1092 (defining liability rules).

²⁸ *Id.* at 1106–07 (giving eminent domain as an example of a liability rule).

²⁹ See U.S. Const. Amend. V (requiring just compensation).

³⁰ *Id.*

³¹ *Id.* at 1127; see also Richard R.W. Brooks, *The Relative Burden of Determining Property Rules and Liability Rules: Broken Elevators in the Cathedral*, 97 Nw. U. L. Rev. 267, 274 (2002) (arguing that although transaction costs are often stated to be the determinant, this requires an implicit assumption about judicial assessment costs).

³² James E. Krier & Stewart J. Schwab, *Property Rules and Liability Rules: The Cathedral in Another Light*, 70 N.Y.U. L. Rev. 440, 453–55 (1995) (discussing judicial “assessment costs”).

³³ Richard A. Epstein, *A Clear View of the Cathedral: The Dominance of Property Rules*, 106 Yale L.J. 2091, 2092–94 (1998) (arguing that “liability rules . . . require requires some level of state intervention in each and every transaction to set the appropriate value for the parties” and the “risk of undercompensation in such situations is pervasive”); see also THOMAS J. MICELI, *THE ECONOMIC APPROACH TO LAW* 177 (2004) (costs of liability rules include “litigation costs and the possibility of court error in setting damages”).

³⁴ Louis Kaplow, *The Patent-Antitrust Intersection: A Reappraisal*, 97 Harv. L. Rev. 1813, 1844 (1984) (“In theory, direct reward systems are preferable A central reason for reliance on a patent system is that it is thought to be too difficult to determine the appropriate level of reward fairly and accurately on a case-by-case basis.”); see Michael Kremer, *Patent Buyouts: A Mechanism for Encouraging Innovation*, 113 Q.J. Econ. 1137, 1140 (1998) (“financing research with monopoly profits . . . is generally less efficient than financing research with tax revenue”).

reason, patent law has always used a property rule system (backed by a strong right to injunctions) that forces the parties to engage in ex ante negotiations to determine the value.³⁵ Search, in the sense of having the parties find each other ahead of time, therefore matters to patent law because it is essential to the smooth functioning of any property rule system.

B. *The Conventional One-Sided View*

In Calabresi and Melamed's original formulation of a property rule, they did not specify which party had to conduct a search. According to Calabresi and Melamed:

If we were to give victims a property entitlement not to be injured we would have to require all who engage in activities that may injure them *to negotiate* with them before an accident.³⁶

The defendant is thus required to negotiate with the plaintiff ex ante. But Calabresi and Melamed did not explicitly say that defendants must find the plaintiff to initiate that negotiation.

Subsequent authors, however, have always reflexively assumed that, because the defendant must negotiate with a plaintiff in a property rule, the defendant also bears the burden of search. Thomas Miceli's textbook on law and economics provides a standard example:

Suppose, for example, that people have the right to be free from accidents caused by trains, and that this right is protected by a property rule. Railroad companies would then have *to identify* and negotiate with all potential accident victims.³⁷

As this example demonstrates, the reflexive assumption is that a property rule places the duty to "identify" the counter-party on the potential user. This one-sided view of search pervades all of property law, including patents. It is plainly reflected in doctrine, which imposes an absolute duty on producers to find patentees before commencing manufacturing activity, and subjects producers to strict infringement liability for that failure.³⁸ It is also plain enough when

³⁵ See *In re Mahurkar Double Lumen Hemodialysis Catheter Patent Litig.*, 831 F. Supp. 1354, 1397 (N.D. Ill. 1993) (Easterbrook, J.) ("The injunction creates a property right and leads to negotiations between the parties. A private outcome of these negotiations . . . is much preferable to a judicial guesstimate about what a royalty should be.").

³⁶ Calabresi & Melamed, *supra* note 14, at 1108 (emphasis added).

³⁷ Miceli, *supra* note 33, at 177 (emphasis added).

³⁸ *In re Seagate Tech., LLC*, 497 F.3d 1360, 1368 (Fed. Cir. 2007) (en banc).

the literature tries to polish and improve the doctrine by making producer search easier in some way. There are numerous proposals to create better patent databases, to publish patent applications faster, and to have better-defined patent boundaries.³⁹ All of these proposals aim to make it easier for producers to find patents and their owners.

But the deeply ingrained nature of this one-sided view of search is most ironically revealed when we consider existing doctrine's fiercest critics. Numerous authors including Mark Lemley, Carl Shapiro, Michael Heller, and James Besson and Michael Meurer,⁴⁰ have all criticized the patent law's search doctrine. These critics argue that producers face almost insuperable difficulties in finding all the relevant patentees, because there are too many patents for producers to wade through.⁴¹ This "patent thicket" literature argues that patent law imposes too onerous a burden on producers. With this conclusion I fully agree.

The reason this literature still reflects the one-sided view of search is in their solution: once this literature finishes arguing that *producer* search is too onerous, it immediately concludes that *all* search is too onerous, without further analysis. The critics argue that high producer search costs means that the only solution is to move to a liability rule regime, where judges simply impose compulsory licenses *ex post*, and so nobody needs to search at all.⁴²

In this way, even the fiercest critics of existing doctrine share an underlying assumption with it. The assumption is that the only type of search is producer search. If producer search is too onerous, then the only alternative imaginable is no search. Stated another way, nobody can imagine requiring patentees to look for producers.

1. The doctrine that *requires* producers to search.

The standard doctrine imposes a duty on producers to search for patentees. This comes from the fact that patent infringement is a strict liability offense.⁴³ That is, anyone who makes, uses, or sells something that is covered by a patent will infringe, *even if they were unaware of the patent*.⁴⁴ Because patent law punishes producers who fail to find

³⁹ See *infra* text accompanying notes 69–71.

⁴⁰ See *supra* note 2 for citations.

⁴¹ See *infra* text accompanying notes 75–78.

⁴² See *infra* text accompanying note 81.

⁴³ *In re Seagate Tech., LLC*, 497 F.3d 1360, 1368 (Fed. Cir. 2007) (en banc) (infringement is strict liability offense).

⁴⁴ See *Boyden v. Burke*, 55 U.S. 575, 582 (1852) ("Patents are public records. All persons are bound to take notice of their contents.").

the patentee (and then obtain a license) with infringement liability, it effectively imposes the duty of search on producers.⁴⁵

On the other side, patent law imposes no duty of search on patentees. Indeed, patentees are free to not do anything at all, without jeopardizing their legal rights.⁴⁶ Of course, some patentees will *voluntarily* search for and approach potential producers to offer them licenses.⁴⁷ But there is no law that requires it. The vision of search is therefore one-sided: the law requires producers to search, but it does not require patentees to do so.

This one-sided view of search is further reinforced by the fact that the law *does* require patentees to help producers find them. That is, the law requires patentees to make the patent document clear and understandable,⁴⁸ and to record their contact information,⁴⁹ so that the owner of a patent can be easily found. But this still reflects a one-sided view of search. Producers are required to actively look for patentees, akin to the tradition of men asking women to dance, while patentees are shy wallflowers who passively wait to be asked (and have to dress in a way as to get noticed). Nothing requires patentees to search in an active way—judges do not even imagine the possibility—just as no Victorian could imagine women asking men to dance.

Patent law maintains this configuration of duties (producers to search, patentees to do nothing) even when it is far easier for patentees to find producers and initiate negotiations than vice versa. The most extreme example is *Rambus Inc. v. Infineon Techs. AG*.⁵⁰ In *Rambus*, the patentee (Rambus Inc.) had a patent application covering a type of

⁴⁵ See Masur, *supra* note 4, at 187 (noting that patent law’s substantive liability rules also function as search rules, in that they allocate search duties and costs).

⁴⁶ *Continental Paper Bag Co. v. E. Paper Bag. Co.*, 210 U.S. 405, 424 (1908) (“The inventor is one who has discovered something of value. *It is his absolute property*. He may withhold the knowledge of it from the public, and he may insist upon all the advantages and benefits which the statute promises to him.” (quoting *United States v. Am. Bell Tel. Co.*, 167 U.S. 224, 249 (1897)) (emphasis added)).

⁴⁷ F. Scott Kieff, *Coordination, Property, and Intellectual Property: An Unconventional Approach to Anticompetitive Effects and Downstream Access*, 56 *Emory L.J.* 327, 396 (2006) (pointing out that “patents are wasting assets” and therefore patentees have some economic incentive to find potential licensees).

⁴⁸ *Merrill v. Yeomans*, 94 U.S. 568 (1876) (“no excuse for ambiguous language or vague descriptions [in patents]”).

⁴⁹ 37 C.F.R. § 1.63(c)(1) (2011) (requiring a patent applicant to record his address).

⁵⁰ 318 F.3d 1081 (Fed. Cir. 2003) (“*Rambus I*”).

memory technology called SDRAM.⁵¹ At the same time, the computer industry had a joint committee, known as JEDEC, that was developing standards for memory technology.⁵² Rambus was a member of this committee, but it did not tell anyone that it had a patent related to this area.⁵³ The committee eventually settled on SDRAM as the standard, and thus everyone in the industry started making irreversible fixed investments (e.g. building factories) on a technology that infringed Rambus's patent.⁵⁴

Once the investments were made, Rambus then sued everyone for infringement and obtained hefty royalties.⁵⁵ This is a classic holdup strategy: *after* an unknowing producer has made irreversible fixed investments in the property (here the patented technology), the patent owner can obtain more in royalties than he could in an *ex ante* negotiation.⁵⁶ The Court of Appeals for the Federal Circuit ruled for Rambus.⁵⁷ Later, in a separate proceeding brought by the Federal Trade Commission, the D.C. Circuit also ruled for Rambus.⁵⁸

Rambus illustrates how far the law insists on its configuration of duties, where producers have a duty to search and patentees have none, even when the relative burdens of compliance are mismatched. For producers like Infineon and other participants in the computer industry, it was literally impossible to find Rambus's patent application, because an *unissued* patent application (which Rambus had) is confidential by law.⁵⁹ But once the computer industry made irreversible fixed investments, Rambus then allowed its patent to issue,⁶⁰ and at this point the industry was made to pay for its

⁵¹ *Id.* at 1084–85.

⁵² *Id.* at 1085.

⁵³ *Id.* (“Rambus did not disclose any patent applications to JEDEC.”).

⁵⁴ *See* Hynix Semiconductor Inc. v. Rambus Inc., 609 F.Supp.2d 951 (N.D. Cal. 2009) (finding infringement).

⁵⁵ *See* Tony Smith, *Rambus' “Very High” DDR Royalty Revealed*, The Register (May 3, 2001) (Rambus charged a royalty of 3.5% for patents covering the standard, and charged only 0.75% for other patents), available at http://www.theregister.co.uk/2001/05/03/rambus_very_high_ddr_royalty/ (visited July 12, 2011).

⁵⁶ *Id.* *See also supra* text accompanying notes 20–24.

⁵⁷ *Rambus I*, 318 F.3d at 1106–07 (ruling for Rambus on infringement and fraud issues).

⁵⁸ *Rambus Inc. v. Fed. Trade Comm’n*, 522 F.3d 456 (D.C. Cir. 2008).

⁵⁹ 35 U.S.C. § 122 (2006). The statute does require the publication of an unissued application after eighteen months, but only if the patent applicant files the application internationally. *Id.*

⁶⁰ Through a variety of procedural mechanisms, most particularly the “continuation” application, patentees have tremendous control over the timing of when their patent will issue. *See generally* Mark A. Lemley &

ignorance. Conversely, for the patentee Rambus, finding the producers and initiating negotiations would have cost almost nothing at all, since Rambus was already a member of the committee. All it would have had to do is tell the committee about its pending patent application (the statute bars the patent office from disclosing a pending application, but not Rambus). Rambus did not do so, however, because it was not legally required to do so;⁶¹ and because it was economically more profitable for Rambus to wait until the industry had made irreversible fixed investments.

Similar, if less extreme, examples of well-known producers being held up by previously unknown patentees abound.⁶² The most famous is probably *NTP, Inc. v. Research in Motion, Ltd.*,⁶³ where the maker of the Blackberry device was sued by a previously unknown entity named NTP, Inc.⁶⁴ Because Research in Motion (RIM) had made irreversible investments in the Blackberry while in ignorance of the NTP patent,⁶⁵ NTP could threaten to shutdown the entire Blackberry business with an injunction.⁶⁶ RIM was forced to pay \$612.5 million to avoid a shutdown of its business.⁶⁷ Once again, the doctrine effectively requires producers to find every patentee ahead of time, even if producer search is impossibly difficult (there are over six thousand known patents covering different components in 3G smartphones,⁶⁸ in addition to potentially more unknown patents) and patentee search is likely to be much easier. It effectively imposes this duty because it levies draconian sanctions (\$612.5 million) for failure to comply.

Kimberly A. Moore, *Ending Abuse of Patent Continuations*, 84 B.U. L. Rev. 63 (2004).

⁶¹ *Rambus I*, 318 F.3d at 1100–02 (finding Rambus had no duty to disclose its claims).

⁶² Although industry participants knew of Rambus’s existence, they did not know that Rambus had a patent. In this sense Rambus was an unknown *patentee*. More often, even the person’s existence is unknown.

⁶³ 418 F.3d 1282, 1292 (Fed. Cir. 2005).

⁶⁴ *NTP, Inc. v. Res. in Motion, Ltd.*, 270 F. Supp. 2d 751, 755 (E.D. Va. 2003) (noting that RIM invented its technology independently, before it knew of NTP or its patent).

⁶⁵ *Id.*

⁶⁶ Oskar Liivak, *Rethinking the Concept of Exclusion in Patent Law*, 98 Geo. L.J. 1643, 1653 (2010).

⁶⁷ *Id.*

⁶⁸ Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 Tex. L. Rev. 1991, 2026 (2007).

2. The literature that proposes *helping* producers to search.

If the law imposes a duty on producers to search (and not only to search, but to *successfully* find), but compliance is very difficult or impossible, what are we to do? One solution that is often contemplated in the literature is to make producer search easier by improving the surrounding infrastructure. Proposals to publish patent applications earlier,⁶⁹ to have patent boundaries marked more clearly,⁷⁰ and to have better patent databases,⁷¹ are all routine in the literature.⁷²

The important point for purposes of my discussion is that these proposals all embody a one-sided view of search. The focus is always on measures that allow producers to find patentees. Nobody ever discusses making patentees look for producers. There are no proposals, for example, to compile databases of commercial products and their producers so that patentees can find them—only for databases of patents and their owners that producers can search.

The corollary is that these one-sided proposals are often very inefficient and ineffective, if our goal is to achieve *ex ante* negotiation of patent licenses. For example, publishing patent applications early would have made it *easier* for the memory-chip producers in *Rambus* to find Rambus’s patent application ahead of time. That does not mean it would have been easy. The change is instead from *literally* impossible (the application is made secret by law) to merely *almost* impossible (the application is buried in a pile along with 1.1 million other pending applications,⁷³ plus over 2 million issued and unexpired patents). Compare this to how easy it would have been for Rambus to find the

⁶⁹ See, e.g., Paul M. Schoenhard, *Reconceptualizing Inventive Conception: Strengthening, Not Abandoning, the First-to-Invent System*, 17 Fed. Cir. B.J. 567, 598–99 (2008) (arguing to publish patent applications immediately upon filing).

⁷⁰ See, e.g., Michael J. Meurer & Craig Allen Nard, *Invention, Refinement and Patent Claim Scope: A New Perspective on the Doctrine of Equivalents*, 93 Geo. L.J. 1947, 1975–78 (2005) (arguing for more “refinement” of patent claims).

⁷¹ See, e.g., Jeanne C. Fromner, *Patent Disclosure*, 94 Iowa L. Rev. 539, 585–86 (2009) (proposing to improve patent databases with better indexing).

⁷² See also Bessen & Meurer, *supra* note 2, at 235–48 (providing numerous suggestions to make it easier for producers to find and analyze patents).

⁷³ U.S. PATENT & TRADEMARK OFFICE, PERFORMANCE AND ACCOUNTABILITY REPORT FISCAL YEAR 2010, at 127 (2010).

very memory-chip producers that it was sitting on the same standard-setting committee with.⁷⁴

3. The literature that argues producers *cannot* search.

In contrast to proposals to make producer search easier, there is a second strand of literature arguing that, at least in most industries, producer search will always be incredibly onerous no matter how much we tinker with the infrastructure. As Mark Lemley and Phillip Weiser note, there are “literally thousands” of patents that cover 3G telephone systems,⁷⁵ and these patents in turn are hidden in a thicket of over two million issued and unexpired patents.⁷⁶ For a producer like RIM to find all these patents ahead of time would be almost impossible.⁷⁷ Of course, it might have been possible for RIM to find a few of those patents, and thus it might have found NTP’s in particular. But as long as it cannot find *every* such patent, another plaintiff would have come along and sued. From RIM’s perspective, whether the plaintiff is named “NTP” or “Company X” is obviously irrelevant. The point is that unless a producer can find every patent ahead of time, it faces the possibility that it will be held up by some unknown plaintiff.

The 3G smartphone market is not alone in facing this problem of “patent thickets,” where hundreds or thousands of relevant patents are required to produce a single product, and these patents are impossible to find because they are hidden in the greater body of two million issued patents.⁷⁸ The same problem afflicts virtually every modern device (*e.g.* a computer, a car, or a television). Virtually every device contains thousands of individual components, and every single component may be covered by one or more patents. To produce the finished commercial product, a license to every one of those hundreds or thousands of patents is necessary. If the producer misses even a

⁷⁴ Cf. Doug Lichtman, *Patent Holdouts in the Standard-Setting Process*, Acad. Adv. Council Bull. 1.3, at 9 (May 2006) (arguing that courts should consider “the ease with which the patent holder could have announced its patent before firms invested in the standard”), available at <http://www.pff.org/issues-pubs/ip/bulletins/bulletin1.3patent.pdf>. Although Lichtman seems to thereby consider the possibility of patentee search, the rest of his paper focuses on producer search concerns.

⁷⁵ Lemley & Weiser, *supra* note 2, at 797.

⁷⁶ Lemley & Tangri, *supra* note 12, at 1117 & n.99.

⁷⁷ Bessen & Meurer, *supra* note 2, at 68–71 (discussing the “patent flood”).

⁷⁸ Lemley & Shapiro, *supra* note 68, at 2025–29 (describing the large numbers of overlapping patents covering products such as 3G smartphones, Wi-Fi devices, and DVD players).

single patent and does not procure a license ahead of time, then he faces the possibility of being held up later.⁷⁹

Limited proposals such as improving patent databases and publishing patents earlier are unlikely to overcome this basic problem of scale. To take a simple example, a producer like RIM in the smartphone industry may begin by searching all the patents that are classified under the category of “telephones,” or “wireless technology,” to see if their product infringes. But in order to make a smartphone, one also needs an LCD screen, a plastic cover, and screws. Each of those components might also be patented. So RIM would have to search through patents on displays, on chemistry, and on fasteners. Additionally, a smartphone needs a processor and software, so RIM has to search all computer hardware and software patents. The end of the road is that to create a smartphone, RIM pretty much has to search through all or nearly all of the two million issued and unexpired patents.⁸⁰ The same logic applies to virtually every modern device, such as a computer, television, and car (the GPS in the car, alone, would be rather akin to a smartphone).

The patent thicket literature thus makes a fully justified point that producer search is impossibly onerous in many cases, in that producers cannot find every single patent that covers their products. This literature is entirely correct that the doctrine requiring producers to find every single patent—on pain of draconian penalties such as a \$612.5 million settlement extracted under the threat of a corporate death penalty—is demanding the impossible. But this literature still shares the one-sided view of search because it cannot imagine any other form of search. Once the critics conclude that it is impossible for producers to find patentees, they immediately argue that the only way to avoid holdup is for courts to deny injunctions and impose compulsory licenses that reflect the “fair” value of a patent.⁸¹ That is,

⁷⁹ Martin Campbell-Kelly & Patrick Valduriez, *A Technical Critique of Fifty Software Patents*, 9 Marq. Intell. Prop. L. Rev. 249, 270 (2005) (noting a single patent can hold up the industry).

⁸⁰ See Bessen & Meurer, *supra* note 2, at 69–70 (noting that firms are frequently sued by patents covering different technology classes and in unrelated industries).

⁸¹ See, e.g., Lee *supra* note 3; Lemley & Weiser, *supra* note 2, at 799–800; see also Bessen & Meurer, *supra* note 2, at 251–52 (arguing for “calibrating” remedies, though expressing reservations about denying injunctions completely); see generally Adam Mossoff, *The Rise and Fall of the First American Patent Thicket: The Sewing Machine War of the 1850s*, 53 Ariz. L. Rev. 165, 169–70 (2011) (“Many scholars concerned about patent thickets hail the U.S. Supreme Court’s recent decision in *eBay Inc. v. MercExchange, L.L.C.*, because the Court made it more difficult for patentees to become hold-

the patent thicket literature argues for converting the patent system from a property rule that relies on ex ante search and negotiation, to a liability rule that requires neither search nor negotiation (since a judge will just impose the license terms ex post by judicial fiat). The only alternative to the doctrine that requires search by *producers*, in the conventional imagination, is *no* search at all.

This narrow-minded focus has real costs, because it creates a false dilemma between two unpalatable options. The only options being considered are producer search (very costly), and judges imposing compulsory licenses, which is also very costly from a social perspective because judges will often get the value wrong.⁸² The one-sided view of search thus leaves us with choosing between demanding the impossible of producers (*i.e.* that they find all the patentees to negotiate), or demanding the impossible of judges (*i.e.* that they value inventions accurately). What nobody considers is a third option, which may well be cheaper from a social cost perspective. Namely, that patentees should find producers to initiate negotiations, and then the parties can negotiate a license reflecting the ex ante value of the invention.

A numerical example will illustrate. The conventional literature compares only (1) the costs of producer search and (2) the costs of judicial error under a liability rule. If it costs producers \$110 to find patentees, while the cost of judicial error is \$100, the two solutions that are proposed are to make it easier for producers to find patentees (reducing the cost to, say, \$90), or to convert to a liability rule (so that we pay the \$100 cost instead of \$110). But if it costs patentees only \$50 to find producers, then we should neither create better patent databases while retaining producer search (costing \$90), nor should we switch to a liability rule where judges determine value by judicial fiat (costing \$100). Instead, we should require patentees to do the search and pay only \$50.

outs through threatening or obtaining injunctions.”). Denying injunctions and awarding compulsory licenses usually go hand-in-hand, since if the patentee does not receive an injunction, he must be given alternative compensation, or else the patentee would be left with nothing.

⁸² As mentioned above, the entire *premise* of the patent system is that judges are unable to value inventions. *See supra* text accompanying note 34. While the advocates of liability rules usually acknowledge the difficulty of valuation in the abstract, they rarely grapple with the fact that their proposal calls into question the foundational premise of the patent system. *See Lemley & Weiser, supra* note 2, at 788.

II. THE RECIPROCAL NATURE OF SEARCH

My point in this Part—and indeed this Article—is that contrary to the universal assumption, search is in fact a reciprocal task. This insight produces a very different view of the patent thicket problem. Before directly applying this insight to patent law it is useful to consider an analogous context where the literature had previously treated a reciprocal problem as one-sided. Exposing the fallacy of the one-sided view was the major contribution of Ronald Coase to tort law.

A. *Coase and the Reciprocity of Tort Causation*

Suppose that a driver crashes into a pedestrian, causing injury. As an intuitive matter, people are prone to blame the driver.⁸³ What this means is that they analyze the problem from the perspective of regulating driver behavior and imposing duties on drivers. If there is a spate of driver-pedestrian accidents, there would be many calls for lower speed limits and increased fines for drunk driving. A functionally similar solution would be to impose a tax (known as a Pigovian tax) on gasoline, which would reduce the amount of driving.⁸⁴ What we are unlikely to see, however, is any proposals to tax or penalize pedestrians. In his famous article on *The Problem of Social Cost*, Ronald Coase showed that this intuitive one-sided view of tort responsibility was misguided.

Coase's fundamental insight was that causation is reciprocal: *both* the driver and pedestrian cause the accident.⁸⁵ The driver could avoid the accident by driving more carefully; but the pedestrian could also avoid the accident by walking more carefully (or, in the extreme, not walking at all and staying home). In other words, society could levy the Pigovian tax or impose tort liability on either party. If we imposed it on drivers, they would drive less; and if we imposed it on pedestrians, they would walk less. Either method would reduce the number of driver-pedestrian accidents. This reciprocity insight is today fundamental to the law and economics analysis of tort law.⁸⁶

⁸³ See John C. P. Goldberg, *Twentieth-Century Tort Theory*, 91 Geo. L.J. 513, 548 (2003) (noting that “notions of responsibility are deeply embedded in ordinary English language” and “[i]n ordinary usage, it would be perfectly appropriate to say that car drivers ‘caused’ car-bicyclist accidents”).

⁸⁴ See ARTHUR C. PIGOU, *THE ECONOMICS OF WELFARE* 192–93 (4th ed. Transaction Publishers 2002) (describing tax on gasoline to reduce driving and alcohol to reduce drinking).

⁸⁵ Coase, *supra* note 6, at 2.

⁸⁶ See J.M. Balkin, *The Rhetoric of Responsibility*, 76 Va. L. Rev. 197, 210 n.39 (1990) (“the reciprocity of causation and harm first noted by Coase and Calabresi . . . is central to the modern law and economics movement”); Mark F. Grady, *Common Law Control of Strategic Behavior: Railroad Sparks and*

The reciprocity of causation leads to an important corollary: Given that there are *two* parties who can avoid an accident, who should take the precaution? In more lawyerly terms, on which party should the law impose the duty to take the precaution? As Guido Calabresi later established, the economically efficient tort rule is to allocate the duty to the *least cost avoider*.⁸⁷ The point is that although causation is *reciprocal*, the cost of avoidance is not *equal* in a particular case. Sometimes it is easier for a driver to avoid an accident; and other times it is easier for a pedestrian to do so. The optimal allocation of liability depends on a *comparison* between the costs of the two sides, and the resulting solution will vary with each individual case.

Coase and Calabresi each marked a revolution in the tort literature. But one irony is that their insights did very little to change doctrine. Although the literature always considered tort responsibility in a one-sided manner, the doctrine was already reciprocal in practice. The contributory negligence doctrine *already* considered the (pedestrian) victim's conduct, and it already imposed a duty on pedestrians to take precautions when they were the lower cost avoider.⁸⁸ In similar vein, patentees sometimes do already conduct voluntary searches in real life (though less often than optimal, because of the lack of legal duties and incentives), but this observation does not defeat my point that the patent literature has taken a one-sided view of search.

B. *The Reciprocity of Patent Search*

Applying the analogy of tort causation to patent searches is straightforward. As seen in Part I, the universal focus of the patent search literature is on one side of the equation: producers. In fact, however, the search problem is reciprocal. In order to initiate ex ante negotiation for a license to a patent, we can have producers find patentees, or patentees find producers. Thus, just as Coase criticized Pigou and many others for their one-sided focus, the first point here is that we must consider both sides of the search equation.

the Farmer, 17 J. Legal Stud. 16–17 (1988); *but see* Richard A. Epstein, *A Theory of Strict Liability*, 2 J. Legal Stud. 151, 165 (1973) (rejecting Coasean reciprocity); Thomas W. Merrill & Henry E. Smith, *Making Coasean Property More Coasean*, J.L. Econ (forthcoming) (noting that “[l]awyers have always had trouble accepting [Coasean reciprocity]”), available at http://extranet.isnie.org/uploads/isnie2010/merrill_smith.pdf.

⁸⁷ Calabresi, *supra* note 9, at 135–40.

⁸⁸ See RESTATEMENT OF TORTS § 467 (1939); *see generally* WILLIAM M. LANDES & RICHARD A. POSNER, *THE ECONOMICS STRUCTURE OF TORT LAW* 88–95 (1987) (describing how the common law contributory negligence doctrine allocates responsibility to the least cost avoider).

The immediate corollary to the reciprocity insight is that, like the least cost avoider analysis in tort, the optimal allocation of the search responsibility will depend on a comparison of the two sides. Sometimes it will be cheap for producers to search for patentees but expensive for patentees to search for producers. At other times it will be cheaper for patentees to search for producers.⁸⁹ The economically efficient allocation will vary from case to case.

The tort analogy can be seen another way. In negligence law, what the law is trying to do is to avoid a social loss—the accident that causes an injury. The reciprocity of tort causation tells us that there are two parties who each can take precautions to avoid this loss: the driver can drive more carefully, or the pedestrian can walk more carefully. The efficient choice depends on a comparison between the costs of these two precautions. The least cost avoider is the person who has the lower cost of precaution, and the doctrinal insight is to allocate the burden of taking precautions to this least cost avoider.

In patent search, what the law is trying to avoid is also a social loss—the inefficiency of inadvertent infringement and holdup. The reciprocity of search tells us that there are two parties who each can take precautions to avoid this loss: the patentee by finding the producer *ex ante*, before fixed investments are made; or the producer by finding the patentee *ex ante*, before fixed investments are made. As long as the parties find each other before the producer makes the irreversible fixed investment, there will be no inadvertent infringement and no holdup. The efficient choice, once again, depends on a comparison between the costs of these two precautions.

III. THE IMPLICATIONS OF RECIPROCITY

The immediate implication of recognizing the reciprocity of search, as I have described above, is that scholars need to consider both patentee and producer search costs, because the optimal search rule is to allocate the duty to the lower cost searcher. This insight is important regardless of whether, after empirical study, one ultimately finds patentees to be the lower or higher cost searcher.⁹⁰ The difference is between coming to a conclusion after considering the question, and ignoring the issue altogether as the literature has done to date.

⁸⁹ See Herbert Hovenkamp, *Notice and Patent Remedies*, 88 TEX. L. REV. SEE ALSO 221, 225 (2011) (“Giving notice of one’s own property rights is often far cheaper than searching for the possible but uncertain rights of others.”).

⁹⁰ One can expect such empirical disagreement since there is disagreement about the search costs of producers. Compare *supra* text accompanying notes 75–76 (arguing that producer search costs are high) with Kieff, *supra* note 47, at 395–96 (arguing that producer search costs are low).

My argument in this Part goes further. My argument is that patentees are the lower cost searcher at least some of the time, and likely a majority of the time. This is, ultimately, an empirical question; and the irony is that this conclusion is necessarily tentative since (per the point above) nobody has studied patentee search costs. But if producer search costs are prohibitively high, as the patent thicket literature has demonstrated, then there is at least a good possibility that patentee search costs might be lower in some cases.

If one grants my premise that patentees are sometimes the lower cost searcher, then the implication is that the law should allocate the duty to search onto patentees in those particular cases. A reader does not need to fully agree with me that patentees are the lower cost searcher in the majority of cases—it is enough that patentees are the lower cost searcher in a non-negligible percentage of cases. Such an individualized, case-by-case, allocation of the duty to search would function similarly to the doctrine of contributory negligence.

A. *Defining Ex Ante Search*

Before proceeding, it is important emphasize one point about my analysis: it pertains to *ex ante* searches. A common reaction to my proposal to make patentees search is that it would usually be impossible for patentees to find producers, because producers will hide their infringing activities. This objection relies on a misunderstanding of what it means to conduct an *ex ante* search.

Consider Coase's famous example of a cattle rancher and a farmer, where the rancher's cattle trample a farmer's crops. *After* the rancher's cattle trample the farmer's crops, it goes without saying that the rancher would have an incentive to hide from the farmer. But Coase never considers this problem in his analysis. The famous Coase Theorem simply says that, if transaction costs are low enough, the rancher and the farmer will negotiate with each other to arrive at the optimal outcome. What gives?

The obvious reason that Coase never considers the possibility that the rancher might hide from the farmer is because it is not relevant *at the point of time* that he is considering the problem. The point that Coase was trying to make was that, *before* the cattle trample the crops, the rancher and the farmer could negotiate to achieve the optimal solution. The purpose of the legal system at this point in time is simply to facilitate the efficient negotiation by reducing transaction costs. At the *ex ante* point in time, the rancher would have no incentive to hide from the farmer, and thus there is no need to consider this possibility.

Patent law works the same way. The purpose of patent law is to facilitate a transfer between a genius inventor with a brilliant idea but no capital, and a manufacturer with lots of capital but no ideas, so that

both can share the profit that arises from commercializing the invention.⁹¹ It is *not* to have an inventor come up with an idea, a manufacturer to then independently develop the same idea, and then have the inventor sue the manufacturer for infringement—such a result is wasteful and is exactly what *ex ante* searching is supposed to *prevent*.⁹² In other words, the purpose of patent search is to facilitate an efficient *ex ante* negotiation between the two parties, occurring *before* the producer independently develops the same invention and invests resources in infringement. At this *ex ante* point in time, there is no need to consider the possibility that a producer would hide from the patentee, because the producer has no incentive to hide and no infringing activities to hide.⁹³ In this way, a patentee would not be looking for infringing activity in order to determine whom to contact; but rather looking for potential cooperative producers. For example, if I hold a microprocessor patent, the point of an *ex ante* search is not to investigate whether Intel and AMD are on the verge of commencing infringement, but to contact those producers because they are large chip manufacturers who have the resources and expertise to commercialize the invention. This understanding of *ex ante* search answers the objection that patentees would be unable to search for producers *ex ante* because they would lack adequate information. The information that patentees would need—namely, whether a producer is a company with expertise and resources in the general technological area of the invention—is usually public and well known.

In theory, the cut-off point between “*ex ante*” and “*ex post*” search is the investment of substantial fixed costs towards infringing activity. Once a producer invests substantial fixed costs (*e.g.* builds a factory tailored to the particular invention), he has an incentive to hide from the patentee even if the actual infringement by making and selling products has not yet commenced. Moreover, once substantial fixed costs have been invested, a negotiation between the patentee and the producer will no longer reach the efficient outcome because the patentee will be able to engage in holdup. For both these reasons, the investment of substantial fixed costs marks the true theoretical boundary between “*ex ante*” and “*ex post*” negotiation. However, because in practice it will be difficult to pinpoint when “substantial”

⁹¹ See Arrow, *supra* note 19, at 614–16 (noting that patents solve the “disclosure paradox” that would otherwise frustrate this transaction).

⁹² See Edmund Kitch, *The Nature and Function of the Patent System*, 20 J. L. Econ. 265 (1977) (arguing that the function of the patent system is to prevent wasteful duplication).

⁹³ A further point to consider, outlined in Part III.C.2, is that the current misallocation of search duty creates a perverse result where *patentees* do have an incentive to hide, even at the *ex ante* point in time.

fixed costs have been invested, in the remainder of this Article I will generally define an *ex ante* search as one occurring before the commencement of infringement.

B. Comparing Search Rules

Because search is reciprocal, it follows that the law can impose the duty of search on either producers or patentees. From a social efficiency perspective, we should choose the legal rule that will result in lower social cost. In comparing the social costs of the two alternative legal rules, however, it should first be noted that they have somewhat different structures.

On the producer side, the current legal rule requiring producers to search, backed by the penalty of injunction threats and associated holdup costs if he fails,⁹⁴ creates a binary choice structure for producers. That is, a rational producer operating under this search duty can choose either to conduct an exhaustive search that finds every patentee, or to conduct no search at all. A rational producer is very unlikely to choose to conduct a *partial* search that finds *some* patentees.

This is because finding only *some* patents does a producer very little good. To a producer, missing a thousand patents will result in holdup, and missing just one patent will still result in essentially the *same* holdup. Having a thousand people threatening to shut down the factory is not very different from having just one, since the producer is only willing to pay one ransom no matter how many threats there are.⁹⁵ For example, suppose the holdup value of a factory is \$100, representing the value of continuing to use the factory. Unless the producer can find *all* the patentees ahead of time for less than \$100, his rational strategy is to spend nothing at all on search and simply pay the \$100 holdup ransom, letting the patentees fight among themselves over how to divide it.⁹⁶ Thus, when assessing the social cost

⁹⁴ It should be noted in this context that holdup, despite its pejorative name, is not always bad. In cases where the producer is the lower cost searcher, the threat of holdup provides an incentive for producers to search ahead of time. Paul J. Heald, *Optimal Remedies for Patent Infringement: A Transactional Model*, 45 Hous. L. Rev. 1165, 1191 (2008).

⁹⁵ See Vincenzo Denicolò *et al.*, *Revisiting Injunctive Relief: Interpreting Ebay in High-Tech Industries with Non-Practicing Patent Holders*, 4 J. Competition L. & Econ. 571, 595 (2008) (presenting mathematical model illustrating how more patent holders means that each patentee receives a smaller share of the holdup rent); *contra* Lemley & Shapiro, *supra* note 68, at 2011 (arguing that “the magnitude of the problem is multiplied by the number of patents that read on the product”).

⁹⁶ This is a simplification, in that I am assuming that the holdup threats all come at the same time. If the threats come sequentially, then the producer

of a rule of producer search, the relevant calculation is the cost for a producer to find every last patent. Unless the producer finds every patent, he will be subject to holdup for the entire continuing value of his investment.⁹⁷

The picture is rather different for patentee searches. If a patentee is faced with a duty to find producers, backed up by the threat of losing his infringement remedy against any producer who he does not approach ahead of time, the patentee will not need to find every producer in order to maintain a good income. For example, if I hold a patent on microprocessors, and the law imposed a new duty on me to search for producers, there are two entities that I would immediately find and approach: Intel and AMD. These two well-known producers together hold over 90% of the market in microprocessors.⁹⁸ A patentee who found these two entities and did not search for any others would thus preserve at least 90% of his remedy. Unlike with producers, patentee search is not an on-off proposition.

Stated another way, a rational patentee would not find every producer even under a rule of patentee search, and it is socially efficient that he does not.⁹⁹ A numerical example will demonstrate this point. Suppose there are ten producers who would be interested in using the invention. The first is a very large producer, who would be willing to pay \$100 for a license (in an ex ante negotiation) because he will use the invention extensively. The second is a slightly smaller producer, who is willing to pay \$90, and so on. Suppose also that the marginal cost of search increased. That is, it is very easy to find the first producer because it is a large well-known company (\$10), but it

will pay \$100 in year 1, and pay another \$100 in year 2, and so on. But since litigation often takes many years, the multiple claims tend to overlap temporally. See S. Jay Plager, *Challenges for Intellectual Property Law in the Twenty-First Century: Indeterminacy and Other Problems*, 2001 U. Ill. L. Rev. 69, 75 (estimating five years). And given the presumption of laches that arises after six years from first infringement, see *A.C. Aukerman Co. v. R.L. Chaides Const. Co.*, 960 F.2d 1020, 1028 (Fed. Cir. 1992) (en banc), the likelihood of sequential non-overlapping threats is much reduced.

⁹⁷ Alternatively, the social cost can also be considered the cost of holdup, if that is the lower cost and producers will rationally choose to be held up. See Mark A. Lemley, *Ignoring Patents*, 2008 Mich. St. L. Rev. 19, 22 (arguing that producers do, in fact, rationally ignore patents).

⁹⁸ Dylan McGrath, *Intel Sets Sights on New Markets*, ELECTRONIC ENGINEERING TIMES p. 14 (Dec. 14, 2009) (“Intel owns more than 80 percent of the microprocessor market. AMD holds about 10 percent, sometimes slightly more.”).

⁹⁹ Cf. RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW § 6.5 (7th ed. 2007) (noting that even a strictly liable defendant will not take non-cost-benefit justified precautions).

becomes progressively more difficult and thus expensive to find smaller and lesser-known producers, so finding the second producer costs \$20, and so on. If we required patentees to search on pain of forfeiting any recovery from producers who are not found, then a rational patentee would spend a total of \$150 (\$10+\$20+\$30+\$40+\$50) to find the five largest and highest-paying producers, and ignore the remaining five, since the sixth-highest-paying producer will pay only \$50, but it would cost \$60 to find that sixth producer.¹⁰⁰

Of course, there is still a social loss from the patentee not finding every producer and thus forfeiting part of his remedy. The social loss is the loss of incentives for innovation that providing a greater patentee remedy would have produced. By definition, the *ex ante* incentive effect of a patent reward is less than the reward itself, since a patentee making investments in research must discount for the risk of failure.¹⁰¹ But as a conservative first approximation I will use the full royalty payment as a proxy for this incentive loss. The social cost of a rule of patentee search is thus the actual search costs expended by a rational patentee to find the relatively larger and better-known producers (which preserves the incentive effect for those producers that a patentee finds), *plus* the incentive loss arising from the forfeited remedy against smaller and unknown producers. In our hypothetical with ten producers, the social cost of a rule of patentee search is thus only \$300, representing the search cost of finding the largest five producers, and the forfeited incentive from the smaller five producers.

Now compare this result with a rule of producer search. Assume for convenience that producer face the exact same amount of search difficulty as producers. Thus, it costs a producer \$10 to find the first patentee, \$20 to find the second patentee, \$30 to find the third patentee, etc. What is the social cost of the rule? Because a rule of producer search requires the producer to find every *last* patentee, the total search cost expended will be \$550. This is an application of the

¹⁰⁰ Note the public and private cost is aligned here. As a society, we would not *want* the patentee to spend \$60 to find a producer who is only willing to pay \$50 in royalties, since the social benefit of the increase in research incentives from the royalty (which cannot be more than \$50) is outweighed by the social expenditure of \$60 in search costs.

¹⁰¹ See Tun-Jen Chiang, *Fixing Patent Boundaries*, 108 Mich. L. Rev. 523, 546 (2010) (a \$100 reward in ten years time will only produce a \$38.56 incentive today at a 10% discount rate). It follows that the opposite is also true: depriving a patentee of \$100 in royalties in ten years will only hurt *ex ante* incentives to the tune of \$38.56. See also Shyamkrishna Balganesh, *Foreseeability and Copyright Incentives*, 122 Harv. L. Rev. 1569, 1603 (2009) (arguing that copyright law should not protect against uses that are unforeseen at the time of creation).

economic law of increasing marginal cost that finding the *last* patentee/producer will be extremely difficult and expensive.¹⁰² Because a rule of producer search requires finding the last patentee but a rule of patentee search does not require finding the last producer, all else being equal a rule of patentee search would be more efficient.

My hypothetical is rather artificial, but in a conservative way. In real life the difference in difficulty between finding the first patent or producer (really easy) and finding the last patent or producer (really hard) is not going to be only ten times, but millions of times. The difference in efficiency between the two search rules is thus likely to be magnified by orders of magnitude.

Moreover, in calculating the social cost under a rule of patentee search, I have assumed thus far that the lost incentive (when patentees choose to forfeit a producer because search is too expensive) is the full amount of the royalty that a producer would have paid. In reality, the forfeiture of a difficult-to-find producer is likely to have only a very minor effect on incentives. This is because a difficult-to-find producer is also likely to be an unforeseen producer at the time of initial research. Stated differently, producers that were known at the time of initial research are (1) easy to find afterwards, and (2) more important to the patentee's incentives. Conversely, a producer that is very hard to find is also likely to be unforeseen at the time of initial research and, therefore, less important to the patentee's incentives.¹⁰³ To illustrate with an example, if I am researching microprocessors, then I will attach tremendous importance to being able to have a remedy against Intel and AMD, both because those two companies are the entities most likely to make extensive use of my invention, and because *I know this ahead of time* when I am conducting my research. Conversely, I will attach less importance to other potential producers of microprocessors, both because they are unlikely to use my invention as extensively, and also because it is cognitively more difficult to attach much importance to an entity I do not even know about and cannot concretely imagine.¹⁰⁴ This is not to say that I will attach *no* importance to having a remedy against future startups who might start building microprocessors, but they are less important than Intel and AMD. Limiting my future rights against such unknown producers is much less likely to diminish my incentives than placing the same limits on my rights against Intel and AMD.

¹⁰² See SAMPAT MUKHERJEE, MODERN ECONOMIC THEORY 88 (4th ed. 2002) (illustrating the law of increasing marginal cost).

¹⁰³ Chiang, *supra* note 101, at 546.

¹⁰⁴ Balganes, *supra* note 101, at 1603.

In sum, although we have very little empirical data on the costs of patentee searching, three points suggest that imposing the duty of search on patentees is more efficient in many cases, and probably the majority of cases. First, there is an extensive literature on the high costs of producer searching. While it is theoretically possible for patentee searching to be even more expensive, at least as a first guess this is unlikely. Second, the social costs of the two search rules are structured differently. There is no need for patentees to find every producer to preserve incentives, whereas producers must find every last patentee to avoid holdup; and this difference is significant once we consider the effect of increasing marginal cost. Third, the social loss from a rule requiring patentees to search is inherently mitigated by the fact that hard-to-find producers are also likely to contribute less to a patentee's original research incentives.¹⁰⁵ This inherent mitigation mechanism applies only to patentee search and not to producer search, because failure to find a hard-to-find patentee under a rule of producer search results not in lost incentives (which is mitigated), but in holdup (which is not). The cumulative effect of these three points means that a rule of producer search is likely to be efficient in the majority of cases, or at least in a non-negligible portion.

C. *Consequences of Misallocating Search Duty*

The previous section provides a rather abstract account of how patentees are likely to be the lower cost searcher. This section describes some real-life symptoms of when search duty is misallocated onto the higher cost searcher. The fact that current patent law displays these symptoms again illustrates the probable misallocation of search duty in at least some cases.

To once again take the analogy of tort law, two things happen when we allocate the duty to take precautions onto the higher cost avoider. The first is that, when the cost of compliance becomes too high, people simply breach their duty rather than comply. Second, when the wrong party is given the duty, it creates the so-called "moral hazard" problem on the part of putative victims. Both phenomena have been observed in patent law, as I shall explain.

1. Breach of duty as a cost of doing business.

A common situation where the duty of taking precautions is placed on the higher-cost party is strict liability. For example, we could hold product manufacturers absolutely liable for any harm caused by their

¹⁰⁵ See Balganes, *supra* note 101, at 546 (arguing that copyright should not protect against unforeseen uses).

products,¹⁰⁶ with no contributory negligence defense,¹⁰⁷ and this effectively translates into a legal duty on manufacturers to make their products absolutely safe. But, of course, the manufacturer is not always the least cost avoider of harm arising from their products; for example the consumer would be the lower cost avoider of harm if he recklessly drives a car and crashes into a tree. At its extreme, an absolute liability regime would *still* allocate the duty to make the product safe to the manufacturer, *i.e.* the manufacturer would have to make the car safe even for reckless drivers, or be liable for any resulting injuries. In reality, while some early product liability cases suggested such an extreme duty, courts quickly backed off once they realized the pernicious consequences.¹⁰⁸

The reason is that although the law *could* theoretically impose such an absolute duty, the result is not that car manufacturers would make their product safe for even a reckless driver. Instead, what will happen is that car manufacturers will ignore this legal duty. Since compliance is impossible, manufacturers will simply breach the duty and treat the consequent legal penalties as a cost of doing business.¹⁰⁹ In such situations, strict liability does not induce more precaution-taking, and therefore does not reduce social cost. In short, just because the law can impose a misallocated duty to make products absolutely safe does not mean that manufacturers can, or will, magically comply with such an impossibly-onerous directive.

The same phenomenon occurs in patent law. The current law imposes an absolute duty on producers to find every patentee before commencing manufacture of a product, on pain of fairly draconian sanctions (holdup through an injunction). But just because the law can impose an impossibly-onerous duty does not mean that producers can or will magically comply with it. Rather, economic theory predicts that they will simply breach the duty and treat the consequent legal penalties as a cost of doing business. As Mark Lemley has described, this is precisely what happens:

[C]ompanies in component industries simply ignore patents. Virtually everyone does it. They do it at all

¹⁰⁶ See *Escola v. Coca Cola Bottling Co. of Fresno*, 150 P.2d 436, 461 (Cal. 1944) (Traynor, J., concurring) (proposing strict product liability).

¹⁰⁷ See, e.g., *McCown v. Int'l Harvester Co.*, 342 A.2d 381, 382 (Pa. 1975) (rejecting contributory negligence defense for strict product liability).

¹⁰⁸ See, e.g., *Henderson v. Ford Motor Co.*, 519 S.W.2d 87, 89–90 (Tex. 1974) (rejecting contributory negligence defense), *overruled by*, *Duncan v. Cessna Aircraft Co.*, 665 S.W.2d 414 (Tex. 1984) (adopting comparative fault).

¹⁰⁹ See Posner, *supra* note 99, at § 6.5 (noting that “the expected cost of liability . . . is less than the cost of avoidance, and so avoidance doesn’t pay”).

stages of endeavor. Companies and lawyers tell engineers not to read patents in starting their research . . . Nor do they conduct a search before launching their own product. Rather, they wait and see if any patent owner claims that the new product infringes their patent.¹¹⁰

The fact that producers prefer to pay the penalty rather than comply with the law by searching often elicits strong condemnation.¹¹¹ The same is true of manufacturers who prefer to pay the penalty rather than make their products absolutely safe, most famously when Ford decided to pay legal damages rather than redesign the Pinto after concluding that the cost of redesign would exceed the expected legal liability.¹¹² This is a classic divide between normal people and law and economics scholars. Normal people think that Ford's conduct (and producers' ignoring patents) is the very definition of evil.¹¹³ Economists think that it is a rational response to legal incentives.¹¹⁴ But regardless of whether one thinks that deliberately breaching an impossibly onerous legal duty is evil, or rational, or both evil and rational, my point is that a legal duty that demands the impossibly onerous from its target is probably a misallocated duty in the first place. And the evidence suggests that this is precisely what has happened in patent law, given that producers have demonstrated that they will pay draconian sanctions rather than comply with the absolute duty to search.

2. Moral hazard and patent trolls.

The second problem with misallocating the duty from the lower cost party to the higher cost party is that it induces so-called "moral

¹¹⁰ Lemley, *supra* note 97, at 21–22.

¹¹¹ See, e.g., Jennifer Kahalelio Gregory, Comment, *The Troll Next Door*, 6 J. Marshall Rev. Intell. Prop. L. 292, 306 n.144 (2007) ("Witnesses for high-tech companies freely admit that they do not perform any patent clearance studies before releasing their products. The current 'head in the sand' approach that is the current standard operating procedure should not be viewed as acceptable to anyone." (internal quotations and alterations omitted)).

¹¹² *Grimshaw v. Ford Motor Co.*, 174 Cal. Rptr. 348, 384 (Cal. App. 4th Dist. 1981) ("Ford . . . decided to defer correction of the shortcomings by engaging in a cost-benefit analysis balancing human lives and limbs against corporate profits.").

¹¹³ See *id.*; Gregory, *supra* note 111, at 306 n.144.

¹¹⁴ Gary T. Schwartz, *The Myth of the Ford Pinto Case*, 43 Rutgers L. Rev. 1013, 1036–38 (1991) (noting that standard law and economics, starting from the *Carroll-Towing* formula down, would call for precisely such cost-benefit balancing); see also Lemley, *supra* note 97, at 25–29 (arguing that producers should ignore patents due to high search costs).

hazard” on the part of the putative victim. For example, if we imposed an absolute duty on drivers to avoid pedestrians, so that drivers are liable for all resulting injuries even when a pedestrian is crossing against the red light, then not surprisingly more pedestrians will jaywalk more frequently, since they no longer bear the consequences.¹¹⁵ This is socially costly since more accidents mean more social loss.

Now imagine something further, which is that instead of being only fully compensated, the pedestrian is given a *super*-compensatory award, so they are in fact made *better* off if they are involved in accident. This moral hazard problem is obviously increased, in that pedestrians now have an incentive to affirmatively *try* and get themselves run over. In such a world, pedestrians would hide in bushes and jump in front of cars at the last minute. Of course, no such world could exist, since it is so obviously absurd.

Except that this is precisely what happens in the patent world. The result of placing absolute liability on producers to search and also giving a super-compensatory remedy (the holdup effect gives a patentee like NTP *more* than what it could have received in an ex ante negotiation) is that patentees affirmatively try and get their patent infringed. Akin to hiding in bushes and jumping in front of cars, patentees like Rambus try to hide their patents from the relevant industry, only springing up after the industry has sunk irreversible fixed investments into an infringing project.¹¹⁶ The phenomenon is so common, and the profits so large, that it has occurred throughout the history of patent law under various names. In the 19th century, this was known as the “patent shark” phenomenon,¹¹⁷ where patentees ambushed farmers who had made irreversible investments into their inadvertently-infringing farm equipment.¹¹⁸ In the 20th century, this was known as the “submarine patent” phenomenon, where patentees would stay hidden (“submerged”) in the patent office until an industry had made irreversible investments, and then the patent would “surface” to hold the industry to ransom.¹¹⁹ Today, the problem is

¹¹⁵ Posner, *supra* note 99, at § 6.4 (in the absence of contributory negligence “the plaintiff would have no incentive to take preventative measures because he will be fully compensated for his injury, and the efficient solution will not be obtained”).

¹¹⁶ See *supra* text accompanying notes 50–61.

¹¹⁷ Gerard N. Magliocca, *Blackberries and Barnyards: Patent Trolls and the Perils of Innovation*, 82 Notre Dame L. Rev. 1809, 1811 (2007).

¹¹⁸ *Id.* at 1822–24.

¹¹⁹ Donald S. Chisum, *Introduction*, 26 J. Marshall L. Rev. 437, 445 (1993) (describing submarine patents as those that “hide unseen beneath the PTO

known as the “patent troll” phenomenon, after the mythical troll that hides under the bridge before emerging to demand a ransom.¹²⁰ In all these cases the patentee’s strategy is the same. And in all these cases, the underlying theme is that patentees benefit from, and thus affirmatively seek, to have their patent infringed and obtain an ex post holdup remedy, rather than to avoid such infringement through ex ante negotiations.

Numerous scholars have discussed the patent troll phenomenon.¹²¹ But the usual explanation focuses on how hard it is for producers to find patents and thus considers only how to make producer search easier.¹²² The contribution of this Article is to show that producers’ inability to search is only half the story. Looking at the problem through the law and economics lens of moral hazard tells us that the more fundamental problem lies on the other side of the equation: *patentees* have inefficiently low incentives to search because they actually benefit from inadvertent infringement and the opportunity to engage in holdup. Making holdup pay privately, even as it is inefficient socially, means more holdup occurs.

D. *Imposing a Duty of Search on Patentees*

My proposal is to impose the search duty on patentees when they are the lower cost searcher. The duty includes not only finding the producer, but also contacting the producer with the patent to initiate negotiations.¹²³ At the same time, it is important to emphasize that a patentee would only need to *initiate* the negotiation—there is no requirement that the negotiation *succeed*. The essence of a property rule, after all, is that the property owner has the option of refusal,¹²⁴ as

‘patent pending’ ocean and, after an industry sets sail unaware of proprietary rights claims, surface with torpedoes ready to fire”).

¹²⁰ Donald S. Chisum, *Reforming Patent Law Reform*, 4 J. Marshall Rev. Intell. Prop. L. 336, 340 (2005) (“[A] troll hides under bridges, metaphorically speaking, waiting for companies to produce and market products.”).

¹²¹ See, e.g., Mark A. Lemley, *Are Universities Patent Trolls?*, 18 Fordham Intell. Prop. Media & Ent. L.J. 611, 615-19 (2008); John M. Golden, Commentary, *“Patent Trolls” and Patent Remedies*, 85 Tex. L. Rev. 2111, 2113 (2007); Michael J. Meurer, *Controlling Opportunistic and Anti-Competitive Intellectual Property Litigation*, 44 B.C. L. Rev. 509, 512-525 (2003).

¹²² See, e.g., Magliocca, *supra* note 117, at 1815 (stating that the troll problem occurs because “the existence of a patent is easy to overlook” and “patent law holds a defendant liable for infringement even if it does not know that an item is patented”).

¹²³ This second prong is necessary to prevent gaming by patentees such as Rambus, who found the relevant producers but then hid the relevant patent.

¹²⁴ Calabresi & Melamed, *supra* note 14, at 1092.

otherwise we fall into a compulsory transfer regime. My point in this Article is that we can preserve a property rule for patents, so that parties freely negotiate the value of inventions, even while reallocating the duty of search; in contradistinction to conventional proposals for a liability rule that relies on compulsory licenses imposed by judicial fiat.¹²⁵

A patentee duty to search would need to be backed up by sanctions for non-compliance, and so patentees who fail to search when required would lose their remedy against a later inadvertent infringer whose infringement could have been prevented by an *ex ante* patentee search. The determination thus requires a court to determine whether a patentee has *breached* the duty to search, and whether the breach *caused* the resulting infringement. The parallel with the duty-breach-causation analysis of contributory negligence is obvious.

Two points about of this standard should be emphasized. The first is that a duty to search arises only if the patentee is the lower cost searcher, and this means the standard is a comparative one. If the producer is the lower cost searcher, then the patentee keeps his remedy whether or not he performs a search. In this sense, I am not asking patentees to perform unreasonable searches, since they would be required to search only when they are able to perform the task at the lowest cost.¹²⁶

The second corollary is that a willful pirate—*i.e.* an infringer who copies the patent—will always be the lower cost searcher. A pirate copying the patent would necessarily know of its existence, and once the patent has been located it is essentially costless to locate the patentee, since the patentee's address can then easily be found through patent office records.¹²⁷ Thus, the contributory search analysis would only apply in cases of inadvertent infringement, not of deliberate piracy.

The three pronged test of duty, breach, and causation of my contributory search defense is designed to mimic the contributory negligence defense of tort law to strict product liability, and the beneficial reciprocal incentives that this legal structure provides.¹²⁸

¹²⁵ See *supra* text accompanying note 81.

¹²⁶ Cf. *Davis v. Consol. Rail Corp.*, 788 F.2d 1260, 1265–66 (7th Cir. 1986) (Posner, J.) (noting that, in general, assessments of reasonableness assume that the other side takes due care).

¹²⁷ 37 C.F.R. § 1.63(c)(1) (2011) (requiring a patent applicant to record his address).

¹²⁸ DOUGLAS G. BAIRD, ROBERT H. GERTNER & RANDAL C. PICKER, *GAME THEORY AND THE LAW* 18 (1994) (demonstrating how both sides have optimal

The law and economics literature has already demonstrated that, somewhat counter-intuitively, manufacturers continue to have optimal incentives to take precautions with their products even when a contributory negligence defense is added to strict product liability.¹²⁹ Applying the same logic, producers faced with strict infringement liability will continue to have optimal incentives to search even when that liability is interspersed with a contributory search defense. The result of placing a contributory duty on patentees is not to diminish producer incentives to search, but only to add incentives for patentees to conduct searches as well.¹³⁰

An objection that may arise at this point is that no patentee would be able to determine ahead of time whether they were the lower cost searcher, and so how could they know whether to conduct the search? The answer to this objection lies, once again, in the analogy to tort law. Nobody knows ahead of time whether a driver or a pedestrian is the lower cost avoider of the accident. The point, however, is that by imposing the duty to take precautions on the lower cost avoider and imposing tort liability on the errant party—determined by a judge and jury *ex post*—*both* drivers and pedestrians will have the right incentive to take reasonable cost-justified precautions ahead of time, even though it is uncertain *ex ante* whether the driver or the pedestrian will be made to bear the loss. By the same token, by imposing a duty on patentees to search when they are the lower cost searcher (and leaving the duty on the producer by default in all other cases), I create the incentive for *both* patentees and producers to conduct reasonable cost-justified searches ahead of time, precisely because neither has full confidence *ex ante* that they would not eventually be found to be the lower cost searcher.

A contributory search defense does face the problem that it requires a case-by-case comparison of patentee search costs against producer search costs, which is difficult and costly for courts to do even *ex post*. In other words, such individualized analysis achieves great precision at a theoretical level but in practice creates high administrative costs. This conflict between ease of administration and theoretical perfection reflects the well-worn rules-versus-standards debate, and I need not

incentives under a rule of strict liability combined with contributory negligence).

¹²⁹ *Id.* See also Landes & Posner, *supra* note 88, at 88 (demonstrating that, although at first blush one might think a contributory negligence defense leads to excessive care by the victim and too little care by the tortfeasor, it in fact leads to optimal care by both).

¹³⁰ See Baird, Gertner & Picker, *supra* note 129, at 14-16 (demonstrating how a pure strict liability regime with no contributory negligence defense produces sub-optimal incentives for victims).

take sides here.¹³¹ In Part IV, I will present a more rule-bound proposal that is more easily administrable, but which comes at the price of compromising theoretical precision.

E. Addressing Objections

1. Requiring property owners to search is unprecedented.

The most important objection to a duty of patentee search is that it seems completely contrary to standard principles of property law. The one-sided view of search is deeply ingrained and is usually regarded as intrinsic to a property right.¹³² In one sense, the very point of this Article is that this objection, and the one-sided view of search that it embodies, is misguided.

An additional, and slightly different, answer is that requiring property owners to search for trespassers is actually neither unprecedented nor unknown to property law. As Jonathan Masur discusses,¹³³ patent law in fact imposes search duties on patentees *after* infringement occurs: unless the patentee finds and sues an infringer within six years from when a reasonable search would have discovered the infringement, the defense of laches deprives the patentee of his remedy against that infringer permanently.¹³⁴ In real property law, the doctrine of adverse possession does the same thing, and goes even further by depriving the property owner of his entire property right.¹³⁵

There are important conceptual and operational differences between patentees performing an ex post search for infringers and an ex ante search for cooperative producers, as I discussed in Part III.A. At the same time, my proposal to impose a duty to perform on patentees to perform an ex ante search is not very radical if one regards it as a logical extension of laches and adverse possession doctrine. Perhaps the greatest irony of the situation is that judges and lawyers find a duty of ex ante patentee/property owner search to be unimaginable,

¹³¹ See generally Richard A. Posner, *Employment Discrimination: Age Discrimination and Sexual Harassment*, 19 Int'l Rev. L. & Econ. 421 (1999) (“Rules have higher error costs but lower administrative costs; standards have lower error costs but higher administrative costs. The relative size of the two types of cost will determine the efficient choice.”).

¹³² See, e.g., Miceli, *supra* note 33, at 177 (reflexively assuming that a property right against injury means that injurers must perform the search).

¹³³ Masur, *supra* note 4, at 187 (noting that patent law’s liability rules “allocate search responsibilities”).

¹³⁴ *A.C. Aukerman Co. v. R.L. Chaides Const. Co.*, 960 F.2d 1020, 1028 (Fed. Cir. 1992) (en banc) (creating a presumption of laches after six years).

¹³⁵ See generally 3 AM. JUR. 2D ADVERSE POSSESSION § 1.

when a duty of ex post patentee/property owner search is so well established.

2. Patentees cannot foresee all uses of their invention.

A likely intuitive objection to a requirement that patentees search for producers is that patentees cannot foresee all possible producers and all possible uses of their invention.¹³⁶ I have already dealt with the argument that patentees cannot foresee all possible producers in Section A, the short version being that it is unnecessary for patentees to find *all* possible producers,¹³⁷ when finding the largest and most well-known producers will preserve over 90% of a patentee's original remedy and corresponding incentives to invent. Perhaps equally important, royalties from producers that a patentee *cannot foresee* are the least likely to contribute to the original incentive to invent, since by definition they were unforeseeable at the time of invention.

A similar response applies to the objection that patentee cannot foresee all future uses. As an initial matter, this objection's factual premise is true enough, in that patentees often discover new markets and new uses for an invention after it has been developed. A good example of such a serendipitous new use is Play-Doh,¹³⁸ which was originally formulated as a non-toxic wallpaper cleaner by Kutol Products.¹³⁹ It was only after Kutol discovered that children were using the substance to mold figures that it was sold as a toy.¹⁴⁰ It would obviously have been difficult for Kutol to have foreseen a toymaker as a potential licensee for its wallpaper cleaner and search for producers in the toy industry.

To this objection there are two responses. First, the determination of the least cost searcher is a comparative one. If a toy maker such as Mattel has the idea to use Kutol wallpaper cleaner as a toy, it would need to find out the chemical formula for that wallpaper cleaner by reading the patent, and in doing so would necessarily know that the substance is patented and who the owner is.¹⁴¹ At this point—which is

¹³⁶ *Cf.* *Grant v. Raymond*, 31 U.S. (6 Pet.) 218, 243 (1832) (arguing for broad patentee rights to amend due to concern about unforeseen uses).

¹³⁷ *See supra* text accompanying notes 98–101.

¹³⁸ *See* U.S. Patent No. 3,167,440 (filed May 17, 1960) (patent for Play-Doh).

¹³⁹ TIM WALSH, *TIMELESS TOYS: CLASSIC TOYS AND THE PLAYMAKERS WHO CREATED THEM* 115–17 (2005).

¹⁴⁰ *Id.*

¹⁴¹ Of course, there are other methods of derivation that do not require reading the patent directly. For example, Mattel might purchase some Kutol wallpaper cleaner and have its chemists reverse engineer the formula. But, as shall be seen in Part IV, that is why 35 U.S.C. § 287 is so important. If

ex ante because it occurs before infringement and before the substantial investment of fixed costs—there would be no conceivable argument that it is more expensive for Mattel to find the patentee than for the patentee to find Mattel. Thus, at least in cases where the unforeseen use occurs by derivation from the patent, the producer would always be the least cost searcher.

Second, the very unforeseeability of the alternative use brings into play the same inherent mitigation mechanism as described in Section A. That is, to the extent that the later use is completely unforeseeable at the time of the patentee’s original conception, the unforeseen use is also unlikely to form a significant part of the patentee’s original research incentive.¹⁴² The serendipitous and unexpected discovery of a new use is, in this sense, a windfall. Removing the windfall would cause relatively little by way of a social loss. And the determination of the least cost searcher is a comparison of social, not private, losses.

3. Patentees will spam producers.

An objection on the other side is that patentees would game any requirement that they initiate contact with producers by spamming every conceivable producer with an email attaching their patent.¹⁴³ If this sufficed to meet a duty of search and preserved the patentee’s infringement remedies, then every patentee will immediately follow this strategy, and the result would be that every producer will receive all two million issued patents (and every future issued patent) in their inbox. The producers would then have to sift through all these patents or risk being held up afterwards, landing us right back at square one.

Essentially, the problem is how to define the “search” that satisfies a patentee duty to search. How *complete* must a search be? If a search is completed by any contact with a producer—no matter how minimal and how indiscriminately such contact is made—then spam would count. But even a slightly more demanding requirement would solve the spam problem.

Somewhat ironically, the well-known way to deal with a spam problem is to slightly—but only slightly—increase the cost on the

Kutol marks its wallpaper cleaner with the patent number, then Mattel will know that the formula is patented.

¹⁴² Chiang, *supra* note 101, at 546, Balganesch, *supra* note 101, at 1603.

¹⁴³ Cf. Kevin J. Kelly, *Placing the Burden Back Where It Belongs: A Proposal to Eliminate the Affirmative Duty From Willfulness Analysis*, 4 J. Marshall Rev. Intell. Prop. L. 509, 526–27 (2005) (noting that patentees adopted a similar strategy in order to obtain enhanced damages from infringers).

spammer, usually through an intermediary who can levy the charge.¹⁴⁴ The point here is that a patentee who indiscriminately emails the patent to every potential recipient on the planet Earth is not truly doing a “search” in any meaningful sense, but is instead de facto placing the burden of sifting through massive amounts of email on the recipient.¹⁴⁵ But even a fairly small cost placed on the sender will require prioritization and dramatically reduce the number of recipients. Proposals to reduce unwanted email often suggest a penny would be enough to prevent most spam,¹⁴⁶ though given the prevalence of junk mail in the postal system, something more costly than a first-class stamp is likely required to reduce the volume of irrelevant mail to a manageable level.¹⁴⁷

A fairly simple way to prevent patentees from spamming producers is to define a reasonable patentee “search” as requiring contact (which then leads to licensing negotiations) to be initiated through an attorney, and not by the patentee *pro se*. This makes the attorney an “intermediary” who can increase the transaction cost and thereby indirectly filter out spam through patentee self-selection.¹⁴⁸ More directly, a manifestly frivolous initiation of contact—one involving a patent that has no relationship whatsoever with the producer’s usual business—can then be punished with disciplinary sanctions on the attorney, providing a direct measure of quality control.¹⁴⁹ Of course, the standard for imposing sanctions should be very high: the point of a patentee-search regime is for patentees to approach *potential* licensees

¹⁴⁴ See Ian Ayres & Matthew Funk, *Marketing Privacy*, 20 Yale J. on Reg. 77, 110–13 (2003) (proposing an “authorized intermediary” regime where an intermediary would charge senders and pay recipients).

¹⁴⁵ See *Id.* at 83 (noting the basic problem of spam is that it externalizes costs to the recipient).

¹⁴⁶ See Jeffrey D. Sullivan & Michael B. De Leeuw, *Spam After Can-Spam: how Inconsistent Thinking Has Made a Hash Out of Unsolicited Commercial E-Mail Policy*, 20 Santa Clara Computer & High Tech. L.J. 887, 924 & n.140 (2004).

¹⁴⁷ Also, as noted above, patentees have already demonstrated that the mere cost of a first-class postage stamp is inadequate to deter them, since many patentees adopted a spamming strategy back when a single letter was enough to open an infringer to enhanced damages. Kelly, *supra* note 143, at 526–27; see also *In re Seagate Tech., LLC*, 497 F.3d 1360, 1371 (Fed. Cir. 2007) (en banc) (raising the burden for obtaining enhanced damages).

¹⁴⁸ Cf. Jonathan S. Masur, *Costly Screens and Patent Examination*, 2 J. Legal Analysis 687 (2010) (arguing that the PTO serves as a “costly screen” to filter out worthless patents).

¹⁴⁹ Cf. Fed. R. Civ. P. 11(b)(3) (requiring that factual allegations in complaints have evidentiary support, or potentially have evidentiary support after further discovery).

before they sink irreversible investments in designing a product, and so a concrete allegation of infringement against a specific product should not be required. The goal is only to require that patentees give a reasonable amount of individualized consideration to each producer in the process fulfilling their duty to search, rather than indiscriminately make contact with all possible producers in the manner of a spammer. The combination of attorney fees and potential sanctions should be more than enough to prevent the spam problem from occurring.

It should be noted that the optimal balance between the competing imperatives of making transaction costs high enough to deter spamming, but not too high so as to deter legitimate patentee contact with producers, is an empirical question. It may emerge that requiring a lawyer to make the contact is too onerous for patentees because attorney fees are too high, and some cheaper mechanism, such as requiring patentees to initiate contact through another intermediary such as the patent office (which could charge a smaller fee), would work just as well.¹⁵⁰ The main point is that the concern with patentees gaming the search rule through spam can be easily addressed by fairly simple mechanisms.

4. Producers will seek declaratory judgment.

Besides the profits from holdup, another reason that patentees often hesitate to contact producers is to maintain their first strike advantage. That is, patentees can choose when and where to file the lawsuit,¹⁵¹ and this forum-shopping ability is highly valuable in a world where judges and juries in different locales have well-known predispositions in favor of certain parties. The Eastern District of Texas, for example, is notoriously pro-patentee, and patentees therefore try very hard to place their cases in this district.¹⁵²

Patentees can only forum-shop, however, if they are the only ones that can file suit. The Declaratory Judgment Act allows a producer to file suit against the patentee, seeking a declaration that the producer's

¹⁵⁰ Obviously this works in the reverse as well, in that if lawyer fees prove too *low* to deter spam, then perhaps this administrative mechanism is needed to charge higher fees.

¹⁵¹ Masur, *supra* note 4, at 187 (noting this as an important reason for patentees to look for infringers (but not to contact them)).

¹⁵² See Yan Leychkis, *Of Fire Ants and Claim Construction: An Empirical Study of the Meteoric Rise of the Eastern District of Texas as a Preeminent Forum for Patent Litigation*, 9 Yale J.L. & Tech. 193, 195, 204 (2007) (“[W]ith an average win rate of just 22%, the Eastern District of Texas is about the worst place in the country to be a defendant in a patent infringement lawsuit.”).

planned activities do not infringe the patent, or that the patent is invalid.¹⁵³ If the producer can file suit first, then the patentee would lose his first strike advantage.¹⁵⁴

Two important limits exist on producers seeking declaratory judgment and making the first strike. First, it is obviously impossible for a producer to file a declaratory judgment suit if the producer is unaware of the patent's existence. Second, under prevailing Federal Circuit doctrine, even if the producer discovers the patent through his own independent search, in the absence of a *patentee-initiated* contact, there is no standing to maintain the declaratory judgment suit.¹⁵⁵ Therefore, a patentee can prevent a producer from filing for declaratory judgment simply by not initiating any communication with the producer.¹⁵⁶

The imposition of a duty on patentees to initiate contact—which is a component of my duty to search—would therefore deprive patentees of an important strategic advantage. But this is a *benefit* of my proposal, not a downside. The point of ex ante negotiation is to have the parties delineate their rights ahead of time, and if the parties cannot agree on what the property right consists of, ultimately both sides must ask a judge to adjudicate the boundary.¹⁵⁷ This is not converting the system to a liability rule: a producer seeking declaratory judgment that the patent is invalid or not infringed is not asking the judge to *value* the invention, but to say what the invention *consists of*. To take an analogy, if your neighbor argues that your house is trespassing on his land, it is a perfectly good response to say that it does not; and ultimately if the two of you disagree on where the boundary of the land lies, then a judge will have to resolve the dispute. Such adjudication of land

¹⁵³ 28 U.S.C. § 2201 (2006) (allowing declaratory judgments).

¹⁵⁴ Once suit is filed, usually both the producer and the patentee seek to transfer the suit to a locale that is in their interest. *See* 28 U.S.C. § 1404(a) (2006) (allowing transfers). Under the so-called “first to file” rule, the forum in which the suit is first filed (including by a producer seeking declaratory judgment) is the preferred forum in this analysis. *Micron Tech., Inc. v. MosaId. Techs., Inc.*, 518 F.3d 897, 904 (Fed. Cir. 2008).

¹⁵⁵ *Prasco, LLC v. Medicis Pharmaceutical Corp.*, 537 F.3d 1329, 1339 (Fed. Cir. 2008) (requiring that the threat of future liability be “caused by” the patentee).

¹⁵⁶ Even if the producer initiates contact with the patentee, this will not create standing for declaratory judgment. *Id.* (noting that patentee refusal to give covenant not to sue in response to producer demand is not enough).

¹⁵⁷ *See* Russell B. Hill & Jesse D. Mulholland, *Effective Use of the Declaratory Judgment Remedy in the Patent Context*, 13 *Tex. Intell. Prop. L.J.* 43, 44 (2004) (noting that declaratory judgment actions “remove the patentee's Sword of Damocles”).

boundaries does not convert the real property system to a liability rule, but is instead a desirable adjudication of property rights so that everyone knows where they stand. Given the general preference is to have property rights delineated clearly ahead of time,¹⁵⁸ allowing earlier recourse to declaratory judgment will help achieve this.

5. The unfairness of enforcing contributory search.

A more amorphous—but not necessarily unimportant—objection to my proposal is based on fairness. There is a common feeling that contributory negligence is a harsh doctrine, in depriving a contributorily negligent victim of his entire remedy. This has led the overwhelming majority of states to convert to a comparative fault regime for tort law.¹⁵⁹ In similar vein, one could argue my contributory search defense is equally harsh. And the objection is quite true.

An initial point needs to be made, however, that harshness is reciprocal. If *depriving* patentees of a massive payday is “harsh” because the penalty is so large, then *imposing* this massive liability on a producer is equally harsh. One cannot say that a large figure is harsh for one side but justified for the other, when both sides bear responsibility for the resulting infringement due to the reciprocity of search. If one were to argue for a comparative-fault approach where patentees kept some portion of their remedy even in cases where the patentee is the lower cost searcher, one would also need to argue for the same comparative-fault regime where producers had some portion of their liability remitted even in cases where the producer is the lower cost searcher.

Another way of saying this is that the harshness of the remedy is proportional to its incentive effect. Imposing draconian sanctions on producers, like a \$612.5 million holdup ransom, creates strong incentives for producers to search. In cases where producers are the lower cost searcher, harsh penalties like holdup actually promote

¹⁵⁸ See Samuel L Bray, *Preventative Adjudication*, 77 U. Chi. L. Rev. 1275 (2010) (arguing that “patent infringement . . . [is] especially amenable to preventive adjudication”). One other consideration is that making declaratory judgment easier might mean more litigation. But making declaratory judgment hard might mean that the adjudication of rights is only delayed until a later date, when the stakes are higher (with accrued damages and fixed investments on the line) and the parties correspondingly litigate harder and spend even more in litigation costs. There is little evidence on which effect predominates. See *Id.* at 1301 (noting that “a highly reticulated, case-by-case cost-benefit analysis . . . would not be judicially manageable”).

¹⁵⁹ DavId. Horton, Comment, *Rethinking Assumption of Risk and Sports Spectators*, 51 UCLA L. Rev. 339, 350 n.67 (2003) (collecting citations for the forty-six states that have adopted comparative fault).

socially efficient outcomes, since the producer will then be more likely to perform the search.¹⁶⁰ In cases where the producers are the higher cost searcher, such harsh penalties are wasteful, since they either produce a sub-optimal outcome (producers search when they are the inefficient party) or exact a socially costly punishment for no purpose. The exact same analysis applies to patentees: depriving patentees of a lucrative remedy creates a strong incentive, but whether the incentive is good or bad depends on whether the legal duty is properly allocated. While contributory negligence may be very harsh in one sense, it is also balanced and efficient.¹⁶¹

With all that said, however, it remains true that there is intuitive discomfort at the idea of patentees forfeiting their entire remedy due to failure to search, much as there is discomfort at the idea of tort plaintiffs forfeiting their entire recovery due to contributory negligence. A comparative fault regime would lessen this discomfort by reducing the recovery in proportion to the amount of “fault” that is attributable to the patentee (in failing to search) or plaintiff (in failing to take precautions).¹⁶² Somewhat surprisingly, there is no great difference in the economic effects of contributory and comparative negligence:¹⁶³ comparative negligence reduces the penalty and thus reduces the incentive, but when the plaintiff is less at “fault” there was presumably less *need* for a strong incentive to induce the correct behavior. The main economic difference is that comparative negligence has higher administrative costs, since it requires judges or juries to allocate “fault” on a case-by-case basis.¹⁶⁴ In this sense the choice between contributory and comparative negligence is yet another iteration of the efficiency-fairness tradeoff that is ubiquitous across law.¹⁶⁵

I do not mean to disparage fairness considerations, and there is no fundamental reason that one cannot implement my proposal through a comparative fault regime instead of a contributory search defense, if

¹⁶⁰ Heald, *supra* note 94, at 1191 (noting that holdup “has the benefit of increasing incentives to search where searching is the efficient strategy”).

¹⁶¹ Posner, *supra* note 99, at § 6.4 (explaining the efficiency of contributory negligence).

¹⁶² RESTATEMENT (THIRD) OF TORTS, APPORTIONMENT OF LIABILITY § 7 (2000).

¹⁶³ Posner, *supra* note 99, at § 6.4 (“Surprisingly, comparative negligence has—at least as a first approximating [sic], and setting administrative costs to one side—the same effects on safety as contributory negligence.”).

¹⁶⁴ *Id.*

¹⁶⁵ See Thomas D. Rowe, Jr., *American Law Institute Study on Paths to a “Better Way”: Litigation Alternatives, and Accommodation*, 1989 Duke L.J. 824, 847-48 (discussing the tradeoff between fairness and efficiency in civil procedure).

one were prepared to accept the higher administrative costs.¹⁶⁶ The only point I would emphasize is that a comparative fault regime must still acknowledge that every inadvertent infringement is “caused” by *both* sides’ failure to search—without this acknowledgement, which will surely be highly counter-intuitive to judges and juries, a comparative fault regime will surreptitiously revert back into an absolute duty on producers to search, since producers will be disproportionately allocated 100% of the fault. In all other respects the conversion of a contributory search defense to a comparative fault allocation is so simple as to require little elaboration.

Another, more complicated, fairness concern relates to distributive impact of my proposal among producers. Stated quickly, the objection is that my contributory search defense will disproportionately benefit the larger producers while doing little to benefit smaller producers. This arises because, for any particular patentee, it is usually easier to find large producers than small producers. Thus, a patentee may be the lower cost searcher vis-à-vis some larger producers, but the higher cost searcher vis-à-vis the smaller producers. The result is that the smaller producers will be strictly liable (the default rule), while larger producers will gain the benefit of my new contributory search defense. This creates a distributive fairness concern.

The objection is true enough, though there are several responses. The first is that the contributory search defense, even for the large producers, will arise only in cases where patentees fail to conduct a cost-justified search, which will presumably be rare. The second is that small producers are not made any worse off than under current law—under current law, they are strictly liable anyway—and in this sense my proposal is Pareto-efficient. The concern is only distributive, and distributive concerns are generally disregarded in law and economics analysis.¹⁶⁷ The third and final response is that, if we really wished to remove this distributive fairness concern, it is possible to do so, but only by more radical changes in doctrine. For example, if we imposed a mirror regime where patentees received no remedy unless the producer is the lower cost searcher and failed to conduct a search, then the fairness problem disappears, while still retaining all the right incentives for both parties.¹⁶⁸ But although this mirror regime will be

¹⁶⁶ One obvious objection, of course, is that comparative fault requires judges to divide value in a way that is reminiscent of the problem of liability rules. *See supra* text accompanying note 34.

¹⁶⁷ LOUIS KAPLOW & STEVEN SHAVELL, *FAIRNESS VERSUS WELFARE* 5 (2002) (stating the conventional approach).

¹⁶⁸ In tort parlance, this shifts from a strict-liability-with-contributory-negligence rule to a no-liability-except-with-negligence rule. For proof that

equally efficient and remove the fairness concern, it requires a very radical departure from existing doctrine and will disadvantage patentees very strongly, since patentees will now presumptively get no remedy unless they prove the producer is negligent. Such radical change seems unjustified given the weight of the concern.

IV. REVERSING SEARCH: SECTION 287'S NOTICE REQUIREMENT

Although a contributory search defense, with a case-by-case comparison of patentee and producer search costs, provides the most theoretically perfect mechanism to determine the lower cost searcher, it faces two problems. First, it has no support in the statute. Second, it requires a highly individualized determination that creates high administrative costs for courts. In this Part, I suggest a more administrable alternative with statutory support.

The proposal is based on 35 U.S.C. § 287. As I describe in Section A, the plain text of this statutory provision imposes a duty on all patentees to give prior notice of their patent to potential infringers, which would normally require search. As I describe in Section B, however, courts have ignored the plain language and eviscerated the provision, because it conflicts with the deeply ingrained one-sided view that says producers should always be the ones doing the searching and patentees have a right to be passive. Repudiating this erroneous one-sided view of search duty thus allows a § 287 to be reinvigorated and helps reallocate the search duty to patentees in an efficient way.

A. *Section 287 as a Search Rule*

Section 287(a) of the patent statute states:

Patentees, and persons making, offering for sale, or selling within the United States any patented article for or under them, or importing any patented article into the United States, may give notice to the public that the same is patented, either by fixing thereon the word "patent" or the abbreviation "pat.", together with the number of the patent, or when, from the character of the article, this cannot be done, by fixing to it, or to the package wherein one or more of them is contained, a label containing a like notice. In the event of failure so to mark, no damages shall be recovered by the patentee in any action for infringement, except on proof that the infringer was notified of the infringement and continued to infringe thereafter, in which event damages may be recovered only

these two regimes produce essentially the same incentives, *see* Baird, Gertner & Picker, *supra* note 128, at 18.

for infringement occurring after such notice. Filing of an action for infringement shall constitute such notice.¹⁶⁹

To parse this rather long statutory section, it first helps to consider the penalty for non-compliance: “In the event of failure so to mark, no damages shall be recovered by the patentee . . . except on proof that the infringer was notified of the infringement.” Thus, § 287 imposes a duty on patentees either to mark a product, or to provide actual notice, *before* infringement occurs, on pain of forfeiting damages. The phrasing of the statute is rather awkward in the sense that it delineates the option of constructive notice (*i.e.* marking) before it delineates the option of actual notice—whereas most notice statutes provide for actual notice before discussing constructive notice—but it is clear enough that the statute provides these two alternatives.

My main argument in this Section is that § 287 is best read as a *notice* statute, that emphasizes actual notice as the gold standard and constructive notice (through marking) as a subsidiary alternative; in contradistinction to the conventional view of § 287 as a *marking* statute,¹⁷⁰ that emphasizes marking as the gold standard and actual notice as a subsidiary alternative. The distinction matters because, as will be detailed in Section B, courts have eviscerated § 287 through two moves: (1) courts have held there is no duty to give notice *unless* there is a duty to mark,¹⁷¹ and (2) courts have construed the duty to mark extraordinarily narrowly.¹⁷² My argument is that the plain language of the statute contradicts both of these moves.

My first argument is that the duty to give notice does not require an obligation to mark. The statute says “[i]n the event of failure so to mark, no damages shall be recovered by the patentee . . . except on proof that the infringer was notified of the infringement.” It does not say “in the event of failure to mark *when there is a duty to mark*,” actual notice is required.

A reader may object that the statute does say that actual notice is required only if there is a failure to “so mark,” and concededly the “so” may be plausibly read as referring to an earlier provision of the statute

¹⁶⁹ 35 U.S.C. § 287(a) (2006). A recent amendment allows the replacement of the patent number in a mark with an internet address (which must link to a web page containing the patent number). Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 16 (2011). This amendment does not affect my argument here.

¹⁷⁰ See *Nike, Inc. v. Wal-Mart Stores, Inc.*, 138 F.3d 1437, 1443–46 (Fed. Cir. 1998) (referring to § 287 and its predecessors as “marking” statutes).

¹⁷¹ *Wine Ry. Appliance Co. v. Enter. Ry. Equip. Co.*, 297 U.S. 387, 398 (1936).

¹⁷² *Id.* (duty to mark arises only if patentee makes a product).

imposing a duty to mark. But the “so” can equally be taken to refer to the *manner* of marking prescribed by the statute—*i.e.* the requirement that marking, if any, be done by placing the word “patent” and the patent number—and not any duty. On this reading, there is a duty to give actual notice whenever there is a failure to mark in the manner prescribed, whether that failure occurs because there is no product to mark, no marking, or a non-conforming mark. As a grammatical matter, both interpretations are equally plausible.

As a textual matter, however, I would argue that my interpretation is superior. According to the conventional interpretation, when the statute says that patentees “*may* give notice” through marking, it really means “*must* give notice,” so that the language imposes a duty to mark. To denote the creation of a duty to mark by the use of the word “*may*”—a word usually associated with voluntary conduct and not legal duty—is at least somewhat strange.¹⁷³

Under my interpretation, there is no such thing as a duty to mark. Rather, § 287 imposes a duty to *give notice* by the provision that “no damages shall be recovered by the patentee in any action for infringement, except on proof that the infringer was notified of the infringement.” Specifying a penalty for failure to undertake certain conduct is the classic language of imposing of a legal duty. On this view, marking is simply one *option* for compliance with the more general duty to give notice: by marking a product, the patentee “*may* give notice” of his patent, and the infringer is accordingly “notified of the infringement” at the time of such marking. But while a patentee *may* comply with the duty of giving notice through marking in the manner prescribed, the gold standard for compliance would still be providing actual notice. This reading, where actual notice is the gold standard and marking is an alternative, is more consistent with the textual meaning of “*may*.” My interpretation also gives every word in the statute meaning, including the “so” part, rendering it consistent with standard legal canons of textual interpretation.¹⁷⁴

Even if I am wrong, however, § 287 would still be a rule that imposes the duty to give notice on patentees. Assuming for argument’s sake that the word “*may*” really means “*must*,” and the “so” refers to the duty to mark, the question becomes how far that duty to mark extends. In *Wine Railway Appliance Co. v. Enterprise Railway Equipment Co.*,¹⁷⁵ the Supreme Court held that this duty to mark

¹⁷³ *Cf.* *Ebay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 392 (2006) (noting that a mandatory rule is inconsistent with the patent statute’s use of “*may*”).

¹⁷⁴ *See* *Murphy v. Utter*, 186 U.S. 95, 111 (1902) (every word in statute presumed to have meaning).

¹⁷⁵ 297 U.S. 387 (1936).

extends only to patentees who make products.¹⁷⁶ As a matter of plain text, this narrow interpretation of the duty to mark is wrong.

On its face, the statute distinguishes between two separate classes of people who must mark: (1) “Patentees” and (2) “persons making, offering for sale, or selling within the United States any patented article for or under them, or importing any patented article into the United States.” The reference to “[p]atentees” is unqualified by any requirement that patentees make an article capable of being marked. The phrase “making . . . any patented article for or under them” clearly modifies only the “person” and not the “patentee,” since there is no comma after “person”; and in any case a sentence such as, “Patentees . . . making . . . any patented article for or under them,” would be nonsensical.¹⁷⁷ Because *all* patentees have a duty to mark, it follows that all patentees must give notice in the absence of marking—even patentees who make no products—and once again § 287 becomes a statute that requires patentees to give either actual or constructive notice before infringement occurs.

In sum, the current moribund state of § 287 requires two judicial moves. First, it requires reading a duty to give notice as contingent on a duty to mark, as without this move the duty to give notice would apply to all patentees. Second, it requires reading a duty to mark extraordinarily narrowly, since otherwise the duty to mark (and its contingent duty to give notice) would once again apply to all patentees. Both of these moves, which courts have made, are implausible as a matter of textual interpretation. The next section details the motivation for courts to twist statutory text as they have: courts have quite candidly admitted that the motivation is the deeply ingrained one-sided view that producers should always bear the obligation of search.

B. Judicial Evisceration of Section 287

Courts have narrowed § 287 in numerous ways, but they all trace back to the Supreme Court’s decision in *Wine Railway*, which held that § 287 does not apply when the patentee makes no products.¹⁷⁸ In response to the argument regarding the plain text of the statute (upon which the court of appeals being reversed had relied), the Court stated:

Obviously, but not [§ 287], a patentee might recover for all damages suffered through infringement without giving

¹⁷⁶ *Id.* at 398.

¹⁷⁷ *Contra id.* at 395 (adopting this nonsensical reading in order to narrow § 287).

¹⁷⁸ *Id.* at 398. Technically, the case interpreted the predecessor statute to § 287, which had for all practical purposes the same wording.

prior actual notice to the infringer. That section subtracts something and creates an exception.

If respondent's position is correct, process patents and patents under which nothing has been manufactured may be secretly infringed with impunity, notwithstanding injury to owners guilty of no neglect.¹⁷⁹

The motivation of the Court in construing § 287 narrowly is made very clear by this passage. It regards § 287 as a narrow "exception" to a patentee's otherwise-absolute right to damages, which is to be narrowed further because a broad interpretation would penalize patent holders who were "guilty of no neglect." But this is begging the question. The Court *assumes* that patentees who fail to provide notice of their patent to inadvertent infringers are nonetheless blameless by definition. This clearly reflects the one-sided assumption that producers bear the exclusive duty of search, and patentees bear none.

Faithfully following the path blazed by the Supreme Court, the Federal Circuit has grafted even more exceptions onto § 287. First, the Federal Circuit held that a patentee who claims only a method as his invention—as opposed to a product—need not provide notice, since it is impossible to affix a physical mark on a method.¹⁸⁰ Even more recently, the Federal Circuit has made clear that even when a patentee claims¹⁸¹ both a method and a product, and makes a patented product, there is no need to mark that product (and thus no penalty for failure) if he only asserts the method claim during litigation.¹⁸² This most recent holding basically eviscerates § 287, because virtually every patent contains method claims, and the method claims usually provide equivalent coverage to the product claim.¹⁸³

This may seem strange to those who are unfamiliar with patent drafting practice. But a skilled patent drafter can describe almost any invention as either a product or a method at will. For example, suppose

¹⁷⁹ *Id.* at 395.

¹⁸⁰ *Bandag, Inc. v. Gerrard Tire Co., Inc.*, 704 F.2d 1578, 1581 (Fed. Cir. 1983).

¹⁸¹ A patent "claim" is a one-sentence description of what the invention is, appearing at the end of the patent and delineating the legal right. See 35 U.S.C. § 112 (requiring patentee to list his claims to the invention).

¹⁸² *Crown Packaging Tech., Inc. v. Rexam Beverage Can Co.*, 559 F.3d 1308, 1316–17 (Fed. Cir. 2009).

¹⁸³ See *Quanta Computer, Inc. v. LG Electronics, Inc.*, 553 U.S. 617, 629–30 (2008) ("Apparatus and method claims 'may approach each other so nearly that it will be difficult to distinguish the process from the function of the apparatus.'" (quoting *United States ex rel. Steinmetz v. Allen*, 192 U.S. 543, 559 (1904))).

the invention is a wheeled cart (back in the Stone Age). The most intuitive way of describing this invention is as a product: “a transportation device comprising a platform supported by wheels.” But I can also describe the same invention as a method: “a process of transporting things comprising *moving* a platform supported by wheels.” For all practical purposes, the first and second claims are the same, in that both cover every likely use of a wheeled cart, and most patents include both types of claims. But under the Federal Circuit’s holding, a patentee who asserts the method claim will be exempt from § 287. Since virtually any invention can be described as a method, this holding eviscerates the statute.¹⁸⁴

Beyond the legalistic problem created by an interpretation that eviscerates the statute, which contradicts standard canons of interpretation,¹⁸⁵ the policy problem created by *Wine Railway* and its progeny is that it creates an incentive for a patentee to not produce any products and therefore to not practice the invention. The patentee not only has the incentive to refrain from producing any products himself, he also has the incentive to prevent any licensee from doing so, since licensees are also required to mark to the extent they produce products.¹⁸⁶ The sum is that two bad things happen: (1) the invention will not be legitimately used, since neither the patentee nor any legitimate licensee will produce a product, and (2) the only people who practice the invention are inadvertent infringers, who receive no notice because patentees are not required to give any, and who are then held up by the patentee after making irreversible fixed investments.

This is the problem of patent trolls, which has been described above, and on which there is an extensive literature.¹⁸⁷ The phenomenon of patent holders making no products, and providing no notice of their patent, only to later ambush producers who independently recreate the same invention, is well known.¹⁸⁸ The policy problem is easy to state: in a case such as this, the patent does nothing except act as a tax on subsequent development—it does not incentivize the creation, disclosure, or commercialization of anything useful, since the producer being ambushed is by definition unaware of the patent and gained no

¹⁸⁴ See *id.* (rejecting argument to limit exhaustion doctrine to apparatus claims because doing so would eviscerate the exhaustion doctrine).

¹⁸⁵ *United States v. Menasche*, 348 U.S. 528, 539 (1955) (courts should not “emasculate an entire section”).

¹⁸⁶ *Maxwell v. J. Baker, Inc.*, 86 F.3d 1098, 1111–12 (Fed. Cir. 1996).

¹⁸⁷ See *supra* Part III.C.2.

¹⁸⁸ See, e.g., Ben Klemens, *The Rise of the Information Processing Patent*, 14 B.U. J. Sci. & Tech. L. 1, 28 (2008) (“a patent troll is one who unfairly takes advantage of informational asymmetries by suing independent inventors who are ignorant of the field of patents in which the troll works”).

technical knowledge from it (if the producer *had* been aware of the patent, he would not have walked into the holdup trap).¹⁸⁹ A patent system that facilitates patent trolls is thus contradictory to the basic purpose of patents in promoting progress.¹⁹⁰ While the patent troll problem is well known, my point here is that this problem should be blamed on the misallocation of search responsibility created by such cases as *Wine Railway*, a point that the literature has not considered.

C. *Reinvigorating Section 287*

A textual application of § 287 would impose a duty on all patentees to give notice to infringers before infringement. If a patentee fails to give notice, he forfeits damages until notice is given. The required notice can be given actually or constructively through marking. But to the extent that patentees choose to give actual notice, it will obviously require the patentee to find the producer first.

This regime differs in several respects from the contributory search regime I have suggested earlier. First, unlike a contributory search regime where patentees need only search when they are the lower cost party, the plain language of § 287 imposes a duty of giving notice on all patentees, regardless of their cost of search. This has the potential to create a misallocation of search duty in the opposite extreme. That is, patentees may now be required to search even when patentee search costs are very high, and when the producer might be the lower cost searcher.

The potential onerousness of an absolute duty on patentees is mitigated, however, by the second difference, which is that the penalty for non-compliance is much less harsh. A patentee forfeits only damages, not a right to injunctive relief, and moreover damages are only forfeited to the point in time when notice is given, either through actual notice or the commencement of marking. A patentee can thus preserve most of his remedy by giving notice even after infringement has commenced, and the statute in fact provides that filing a suit for infringement “shall constitute such notice.”¹⁹¹

The fact that patentees retain their right to injunctive relief raises the opposite concern, which is that the forfeiture of damages may not be sufficient to deter opportunistic holdup. In cases where the holdup strategy is sufficiently lucrative, some patentees may still choose to engage in patent troll tactics of hiding their patent and giving no notice, choosing to forfeit damages in pursuit of the greater profit from

¹⁸⁹ See Christopher A. Cotropia, *The Individual Inventor Motif in the Age of the Patent Troll*, 12 Yale J.L. & Tech. 52, 62 (2009).

¹⁹⁰ U.S. Const. Art. I, § 8, cl. 8.

¹⁹¹ 35 U.S.C. § 287(a).

using injunctions for holdup. For example, in *NTP v. RIM*, the assessed damages of \$53.7 million¹⁹² pale in comparison to the eventual \$612.5 million settlement.

Both the possibility of too much deterrence in some cases (where the producer is the lower cost searcher) and insufficient deterrence in others (where the patentee is the lower cost searcher and engages in troll tactics) are valid concerns. The bottom line is that the § 287 route is less theoretically perfect than a contributory search defense, where the least cost searcher can be identified and the remedy properly tailored on a case-by-case basis.¹⁹³ The counter-point is that the § 287 route has the advantage of lower cost of administration and the more solid statutory support, making it a more practical route for courts to implement.¹⁹⁴ Overall, because patentees are likely to be the lower cost searcher quite often,¹⁹⁵ creating a robust duty to search through § 287 is likely to be better than the status quo where § 287 is effectively dead and no other statutory provision requires patentee search.

V. RECIPROCITY OF SEARCH IN OTHER PROPERTY CONTEXTS

As a matter of theory, the same one-sided view of search pervades every area of property law. Real property law expects someone who wants to use Blackacre to find the owner and purchase the property before using it. Copyright law expects someone who wishes to use a copyrighted work to find the owner and negotiate a license before copying it. And in theory, the assumption is false in all of these contexts. There is no intrinsic reason that a real property owner cannot

¹⁹² *NTP, Inc. v. Res. in Motion, Ltd.*, 418 F.3d 1282, 1292 (Fed. Cir. 2005).

¹⁹³ See Roger D. Blair & Thomas F. Cotter, *Strict Liability and Its Alternatives in Patent Law*, 17 Berkeley Tech. L.J. 799, 833 (2002) (arguing that the costs and benefits under different search and liability regimes cannot be precisely quantified).

¹⁹⁴ There is, of course, the problem that *Wine Railway* is a Supreme Court case, and lower courts such as the Federal Circuit cannot directly overrule it. But a motivated lower court can dodge a disfavored decision in numerous ways. The simplest is to hold that, because *Wine Railway* interpreted the predecessor statute to § 287, it does not apply to § 287 itself, which has slightly different language. This is admittedly disingenuous because the language differences are immaterial. But the Federal Circuit pulled precisely this trick in *Forest Group, Inc. v. Bon Tool Co.*, 590 F.3d 1295 (Fed. Cir. 2009), where it distinguished the prior interpretation of the prohibition on false marking (now codified at 35 U.S.C. § 292) because the older cases arose under the predecessor statute. *Id.* at 1302. This disingenuous reliance on immaterial linguistic changes was clearly motivated by the policy concern that the prior interpretation had rendered § 292 toothless. *Id.* at 1304. Equally, *Wine Railway* has rendered § 287 toothless.

¹⁹⁵ See *supra* text accompanying notes 104–105.

be made to find potential trespassers; and there is no intrinsic reason that copyright owners cannot be made to find potential users.

But the practical consequences of subscribing to the one-sided view of search matters far less if the user/producer is the lower cost searcher in the overwhelming number of cases. The reason the reciprocity insight has practical relevance in tort law and patent law is that producers are not always the least cost searcher, just as manufacturers are not always the least cost avoider. Placing the duty of avoidance on the wrong party in those cases then leads to inferior social outcomes. This Part takes a brief look at whether the reciprocity insight has any potential practical application to other areas of property law.

A. *The Non-Problem in Real Property*

A simple observation is that real property law has long adhered to the one-sided view of search, but we have observed very few problems in real property as a result of the absolute allocation of search duty to users. As Herbert Hovenkamp has observed: “The real-property system has no equivalent of the . . . ‘patent troll.’ People do not often surreptitiously acquire land, leave it vacant, and then make a surprise announcement of ownership only after someone else has developed it.”¹⁹⁶ The reason is simple: in real property, the lower cost searcher is almost always the potential trespasser and not the property owner.

The reasons for this are manifold, but two are most important. Hovenkamp and others usually focus on the first: in real property, the system of notice is better, and better notice means lower producer search costs.¹⁹⁷ Everyone knows that Blackacre is owned, and the owner is easy to find by looking up “Blackacre” in the local property records office. The size and scope of the property right is also easy to demarcate with precision because land is tangible, and can be enclosed with a literal fence. In contrast, a commercial product may not be patented at all, and in any case one will not find the owner of a patent covering the Blackberry by looking up “Blackberry” in the patent office database.¹⁹⁸ And patent “fences” that exist only on paper are notoriously vague and much less effective in providing notice to potential infringers.¹⁹⁹ These differences in the infrastructure of notice makes user-search harder in patent law, and easier in real property.

¹⁹⁶ Hovenkamp, *supra* note 89, at 228.

¹⁹⁷ *Id.*; see also Bessen & Meurer, *supra* note 2, at 8–11 (arguing that the problem comes from lack of notice).

¹⁹⁸ See *supra* text accompanying note 80.

¹⁹⁹ See, e.g., Joseph Scott Miller, *Enhancing Patent Disclosure for Faithful Claim Construction*, 9 Lewis & Clark L. Rev. 177, 206 (2005); Dan L. Burk & Mark A. Lemley, *Quantum Patent Mechanics*, 9 Lewis & Clark L. Rev. 29, 50–

But a more important reason is the owner-to-user ratio and the corresponding scale of a search. A piece of land usually only has one owner but an almost unlimited number of potential users. This is quite unlike the situation in patent law, where a single commercial product may have zero, one, or thousands of patentees who have a claim over it.²⁰⁰ And unlike the situation where a patentee can keep most of his income just by finding a few of the most well-known producers and letting the small-fry go, the rivalrousness of land use means that if any single trespasser is given the right to continue using the land (the equivalent of my contributory search defense), the owner is necessarily deprived of that land. What this means is that an equivalent to my contributory search defense in real property law would now require an owner to find every potential trespasser ahead of time, with the same increasing-marginal-cost problem that finding the last trespasser is exponentially harder than finding the first. Thus, quite apart from the higher quality of notice infrastructure in real property—a problem that we may be able to partially address in patent law with better databases and clearer patent boundaries—the insurmountable difference in scale is responsible for the fact that users are almost always the lower cost searcher in real property. And that means that, as a practical matter, a flat rule that users have the absolute duty to search is efficient in the real property context.

B. *The Potential Misallocation in Copyright*

The potential usefulness of the reciprocity insight in copyright law is less clear. On the one hand, copyright shares some of the characteristics as the patent system: copyright rights exist as intangible rights, have vague boundaries,²⁰¹ are non-rivalrous, and there are many potential copyright claimants for any commercial work.²⁰² On the other hand, the potential for inadvertent infringement

52 (2005); Gretchen Ann Bender, *Uncertainty and Unpredictability in Patent Litigation: The Time is Ripe for a Consistent Claim Construction Methodology*, 8 J. Intell. Prop. L. 175, 209–10 (2001).

²⁰⁰ Cf. Dan L. Burk & Mark A. Lemley, *Policy Levers in Patent Law*, 89 Va. L. Rev. 1575, 1590 (2003) (arguing that much of the patent system is built on the assumption of a “one-to-one correspondence” between the patent and a commercial product, but that this assumption is untrue).

²⁰¹ Justin Hughes, *Copyright and Incomplete Historiographies: Of Piracy, Propertization, and Thomas Jefferson*, 79 S. Cal. L. Rev. 993, 997 (2005) (“copyright has long had fuzzy boundaries”).

²⁰² See Mark A. Lemley, *Dealing with Overlapping Copyrights on the Internet*, 22 U. Dayton L. Rev. 547, 571 (1997). For example, posting a clip of a Harry Potter movie on the internet may violate the studio’s copyright in the movie, the screenplay writer’s copyright in the screenplay, a composer’s

is much lower in copyright law than in patent law, because copyright requires actual copying as a condition of infringement liability.²⁰³ As pointed out previously, a willful copier of a patent is highly likely to be the lower cost searcher, since he would by definition already know of the patent's existence. By the same logic, the copyright violator might be expected to have been the lower cost searcher in almost all cases.

But although it is less common than in patent law, we do see cases of inadvertent copyright infringement, and we do see so-called “copyright trolls” that adopt the exact same holdup strategy based on misallocation of search cost. A good example is the case of Blake Field, who wrote an article on his own website, deliberately ensured that it would be included in Google’s “cache” feature, and then sued Google for copyright infringement.²⁰⁴ Google thereby “inadvertently copied” the article, in what would otherwise seem an oxymoron. Because the prima facie case of copyright infringement is quite plausible,²⁰⁵ the troll strategy can be used to extract profitable nuisance settlements.²⁰⁶

Beyond cases of automated copyright infringement—where the inadvertent infringement occurs because it is done by a computer—another source of inadvertent copyright infringement is the fact that copyright extends far further than most people realize, and this can trip up even sophisticated commercial entities.²⁰⁷ For example, if one were to shoot a movie in a museum, every piece of artwork in the museum would be separately copyrighted by the original artist—the museum’s ownership of the physical artwork and permission to film

copyright in any music, and the J.K Rowling’s copyright in the underlying novel upon which the movie is based.

²⁰³ *Arnstein v. Porter*, 154 F.2d 464, 468 (2d Cir. 1946).

²⁰⁴ *Field v. Google Inc.*, 412 F.Supp.2d 1106, 1123 (D. Nev. 2006) (“Field took a variety of affirmative steps to get his works included in Google’s search results . . . and he deliberately ignored the protocols that would have instructed Google not to present ‘Cached’ links.”).

²⁰⁵ The court in *Field* ultimately held for Google on a fair use defense. *See id.* But fair use is notoriously indeterminate and thus most defendants would pay a nuisance settlement.

²⁰⁶ *See* Christopher M. Swartout, Comment, *Toward a Regulatory Model of Internet Intermediary Liability: File-Sharing and Copyright Enforcement*, 31 *Nw. J. Int’l L. & Bus.* 499, 512 (2011) (noting the activities of Righthaven, which obtains nuisance settlements from small websites).

²⁰⁷ *See* Coree Thompson, *Orphan Works, U.S. Copyright Law, and International Treaties: Reconciling Differences to Create a Brighter Future for Orphans Everywhere*, 23 *Ariz. J. Int’l & Comp. L.* 787, 825 (2006) (“Many authors or subsequent creators have no idea what they can and cannot do to facilitate the use of works and avoid liability. Even sophisticated institutions, well-versed in the safe-harbor provisions of the Copyright Act, proceed cautiously when applying existing law to their actions.”).

would be insufficient.²⁰⁸ Including images of the artwork in the movie would thus potentially violate the copyright. Similarly, including snippets of text from a novel that a character is reading, brief interludes of background music playing on the street, or even a corporate logo displayed on a street sign, would all be potential infringements of copyright.²⁰⁹ In fact, it is almost impossible to point a camera on a street and *not* capture numerous things that are copyrighted.

Even if a movie-maker is aware of the existence of these individual copyrights, another source of difficulty is that it may not be easy to find each of the numerous copyright owners. This is because, unlike in patent law, there is no need to register a copyright for it to be legally valid.²¹⁰ Thus, a sophisticated movie studio may be aware that each museum artwork is copyrighted, and that every piece of music and snippet of text is copyrighted, but it will still have tremendous difficulty finding every artist, composer, and author to negotiate licenses because there is no central depository with their names and addresses in easily searchable format.²¹¹ The bottom line is that search costs for producers can still be very high in copyright law, notwithstanding the requirement of actual copying.

The existing literature often discusses this problem from the viewpoint of the so-called “orphan works” problem.²¹² An orphan work is one where the copyright owner cannot be easily found.²¹³ An example would be a novel whose author is dead, and whose heirs cannot be located. A producer seeking to distribute the work in some form—for example a studio seeking to make a movie based on it, or Google seeking to include the novel in Google Books—thus faces high search costs. This problem recently doomed the Google Books

²⁰⁸ 17 U.S.C. § 202 (2006) (ownership of copyright is distinct from ownership of physical object).

²⁰⁹ There is, as always, a potential fair use defense. 17 U.S.C. § 107 (2006). But fair use is too unreliable a defense to provide much comfort. *See supra* text accompanying note 206.

²¹⁰ 17 U.S.C. § 408(a) (2006) (registration is permissive).

²¹¹ Katharina de la Durantaye, *Finding a Home for Orphans: Google Book Search and Orphan Works Law in the United States and Europe*, 21 Fordham Intell. Prop. Media & Ent. L.J. 229, 234–35 (2011) (noting the difficulty of locating authors).

²¹² *See* REGISTER OF COPYRIGHTS, REPORT ON ORPHAN WORKS (2006) (hereinafter Register’s Report), available at <http://www.copyright.gov/orphan/orphan-report-full.pdf>.

²¹³ *Id.* at 1.

settlement and has called into question the viability of the whole project.²¹⁴

It is important to understand that the orphan works problem is another iteration of the more general problem of holdup threats.²¹⁵ If the heirs *never* show up, there would be no problem for the studio to make the movie or Google to include the novel in Google Books. The concern is that once the movie is made and the database is created, the heirs will *then* emerge and hold up the studio and Google for ransom.²¹⁶ Thus, the problem is the same, even if the particular symptoms are not. In the patent troll context, producers make the investment and are held up for it. In the orphan works context, producers fear being held up and refrain from making the socially productive investment in the first place. Either way, the result is inefficient.

Although the literature has not previously considered the orphan works and patent troll problems together, scholars in both areas have converged on extremely similar suggestions. Just like the patent thicket literature,²¹⁷ the main proposal in the copyright arena is to convert to a liability rule regime where compulsory licenses would be issued whenever producer search costs are too high.²¹⁸ No consideration is given to the possibility of making copyright holders search for producers instead.²¹⁹

The easy implication of reciprocity for the copyright literature is that one should at least *consider* the search costs of copyright holders, and the possibility of requiring copyright holders to search. A more difficult question is whether, after empirical study, one is likely to find that copyright holders are the lower cost searcher. Unlike in the patent

²¹⁴ *Authors Guild v. Google, Inc.*, 770 F. Supp. 2d 666, 677–78 (S.D.N.Y. 2011) (holding that the orphan works problem is a matter for Congress and thus rejecting the mechanism contained in the Google Books Settlement to address it).

²¹⁵ See generally Klein, *supra* note 20, at 356–57.

²¹⁶ See Steven Hetcher, *Orphan Works and Google's Global Library Project*, 8 Wake Forest Intell. Prop. L.J. 1, 21 (2007) (noting “fear that the owner of the orphan work may later surface and hold up the release of the transformative work”).

²¹⁷ See *supra* Part I.B.3.

²¹⁸ See, e.g., Register's Report, *supra* note 212, at 8–13 (proposing to allow users to be able to pay only a “reasonable” royalty if they cannot find the copyright owner after a reasonable search).

²¹⁹ Cf. *Authors Guild*, 770 F. Supp. 2d at 670 n.3 (criticizing the fact that “Google reversed the default copyright arrangement by shifting the burden to rightsholders to assert their rights” (quoting Alessandra Glorioso, *Google Books: An Orphan Works Solution*, 38 Hofstra L. Rev. 971, 992 (2010))).

context, where there is often only a small number of producers who can realistically commercialize an invention, the potential derivative uses of a copyrighted work are very numerous, and the number of potential users even more so. A novel may be subject to sequels written by an almost-infinite number of potential authors, for example, and it can also be converted into other formats such as movies and plays, or translated into numerous languages.²²⁰ The comparison of search costs in the copyright context thus presents a more complicated question than in the patent context, and I cannot form even a tentative conclusion given the absence of empirical data on the question.

CONCLUSION

This Article makes two contributions to the literature on search and intellectual property law. The first point is that search is a reciprocal problem. Thus, at a minimum, those studying the problem of search cost should at least *consider* both the search costs of property owners as well as the search costs of potential infringers. The second contribution is that, in the context of patent law, placing the search obligation on patent holders is likely to be efficient in many cases, because patentees are often the lower cost searcher.

The first point is probably more important. Contrary to the conventional assumption, there is no inherent reason that search must be done by the producer. Property owners should not be magically relieved of responsibility for search. What property rights require to solve the holdup problem is *ex ante* negotiation, and negotiation can occur as long as the parties find each other. Whether one side or the other should have the obligation of search depends on which side can fulfill this function more cheaply, effectively, and efficiently. Even if one were to conclude after conducting an analysis that producers often have lower search costs, and that the current regime is therefore correct, the point is still that the search costs of patent owners cannot be taken for granted but must be considered.

My second argument, however, is that there will at least be some circumstances where patent owners are the lower cost searcher and should be given the obligation to search, enforced by some penalty for failure to comply. Given the difficulties faced by producers in finding every patent and its owner—problems that have been described by the existing patent thicket literature in detail—there is much reason to believe patentees will often have lower search costs. The difference between my proposal is that I would reallocate the duty of search to patentees, whereas the existing literature automatically assumes that

²²⁰ See 17 U.S.C. § 106(2) (2006) (exclusive right to create derivative works).

search is impossible for all parties. Somewhat ironically, my solution of reallocating search is less radical in the sense that it preserves the property-rule nature of the patent system and relies on private negotiations to determine the value of inventions—the difference is only that patentees now have the onus to find producers and initiate those negotiations. In contrast, the existing literature often calls for shifting patent law to a liability rule regime that abolishes search, but which has the corresponding downside that it requires courts then directly measure the value of inventions, a task that courts are institutionally ill-equipped to perform. My proposal offers a more efficient option in cases where patentee search costs are lower than the costs of judicial error. Given that the entire premise of having a patent system is that the cost of judicial error in direct measurement of the value of inventions is too high (since otherwise we should simply award cash prizes), this efficiency gain will likely be quite frequent.