



Irreparable Harm from Patent Infringement

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The Patent Act empowers a court to issue an injunction “to prevent the violation of any right secured by patent.”¹ Whether a court will permanently enjoin an infringer depends on whether (1) the patent holder would suffer irreparable harm otherwise, (2) its legal remedies are inadequate, (3) the balance of hardships favors the patent holder, and (4) the injunction would not disserve the public interest.² Similar factors inform the grant of a preliminary injunction.³ The Federal Circuit often says that the harm from patent infringement is irreparable if it cannot be measured.⁴ I say that such harm is irreparable because it irreversibly destroys wealth.

I. IMMEASURABLE OR IRREPARABLE HARM?

The Federal Circuit has found harm irreparable due to its immeasurability when patent infringement causes the patent holder to suffer price erosion or to lose market share, customers, goodwill, or brand value.⁵ However,

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¹ 35 U.S.C. § 283.

² eBay Inc. v. MercExchange, L.L.C., 547 U.S. 388, 391 (2006). A court balances the factors. See, e.g., Bayer Pharma AG v. Watson Labs., Inc., No. 12-1726-LPS, 2016 WL 7468172, at *3 (D. Del. Dec. 28, 2016).

³ Abbott Labs. v. Sandoz, Inc., 544 F.3d 1341, 1344 (Fed. Cir. 2008).

⁴ See, e.g., Douglas Dynamics, LLC v. Buyers Prods., Co., 717 F.3d 1336, 1344 (Fed. Cir. 2013); Apple Inc. v. Samsung Elecs. Co. (*Apple III*), 809 F.3d 633, 650 (Fed. Cir. 2015) (Reyna, C.J., concurring).

⁵ Celsis in Vitro, Inc. v. CellzDirect, Inc., 664 F.3d 922, 930 (Fed. Cir. 2012); 14i Ltd. v. Microsoft Corp., 598 F.3d 831, 862 (Fed. Cir. 2010); Reebok Int’l Ltd. v. J. Baker, Inc., 32 F.3d 1552, 1558 (Fed. Cir. 1994). Related harms found to be irreparable include forgone benefits from network effects or demand complementarity. *Apple III*, 809 F.3d at 645; Apple, Inc. v. Samsung Elecs. Co. (*Apple D*), 678 F.3d 1314, 1337 (Fed. Cir. 2012). Apart from creating this line of cases emphasizing immeasurability, the Federal Circuit has found harm irreparable if the infringer cannot pay damages. Apple Inc. v. Samsung Elecs. Co. (*Apple II*), 735 F.3d 1352, 1369 (Fed. Cir. 2013); see also J. Gregory Sidak, *Is Harm Ever Irreparable?*, 2 CRITERION J. ON INNOVATION 7, 13 (2017).

former Chief Judge Randall Rader, writing for the court in *Celsis in Vitro, Inc. v. CellzDirect, Inc.* in 2012, hinted in dicta that the destruction of value—not measurability—is the essential attribute causing the irreparability of harm: “the simple fact that one could, if pressed, compute a money damages award does not always preclude a finding of irreparable harm.”⁶ Irreparability is thus not a legal conclusion compelled by insufficient estimation techniques or inadequate data; it is instead the distinguishing economic characteristic of the harm itself. “As its name implies,” wrote Chief Judge Rader, “the irreparable harm inquiry seeks to measure harms that no damages payment, however great, could address.”⁷ By comparison, the Supreme Court considers environmental injury irreparable because “by its nature” it “is often permanent or at least of long duration.”⁸

This insight—that harm that defies measurement differs in kind from harm that defies remediation—has a simple but profound counterpart in economic reasoning: patent infringement irreparably destroys consumer surplus by impairing technical progress. Were it to amplify that theme, the Federal Circuit would give economic salience to the fourth factor relevant to an injunction—whether or not the injunction’s issuance would serve the public interest, which the welfare of consumers well approximates.

II. THE PUBLIC INTEREST IN AVERTING THE IRREVERSIBLE SACRIFICE OF CONSUMER SURPLUS

In a market where dynamic competition begets rapid innovation, firms compete robustly by introducing the next generation of disruptive technology, not by making piddling reductions in the price of a mature product. Dynamic competition is a tournament to define entirely new demand curves for products that do not yet exist or to push existing demand curves dramatically outward with more efficient production processes that enable vastly

⁶ *Celsis in Vitro*, 664 F.3d at 930.

⁷ *Id.* Chief Judge Rader proceeded to rely on the Federal Circuit’s precedent that difficulty of quantification establishes irreparability of harm. He cited approvingly the district court’s statement that “[t]here is no effective way to measure the loss of sales or potential growth—to ascertain the people who do not knock on the door or to identify the specific persons who do not reorder because of the existence of the infringer.” *Id.* Chief Judge Rader then reiterated the Federal Circuit’s view that “[p]rice erosion, loss of goodwill, damage to reputation, and loss of business opportunities are all valid grounds for finding irreparable harm.” *Id.* He agreed with the district court that “damage to ongoing customer relationships” constitutes irreparable harm and that an irreparable “loss of goodwill” can occur “when an effort is later made [by the patent holder] to restore the original price” after price erosion has suppressed it. *Id.*

⁸ *Amoco Prod. Co. v. Village of Gambell, Alaska*, 480 U.S. 531, 545 (1987).

lower quality-adjusted prices.⁹ New products generate enormous gains in economic welfare, much of which consumers capture as consumer surplus.¹⁰

Patent infringement harms technical progress when it so constrains the patent holder's profit on its successful investments in patented technology as to cause the patent holder to reduce or cancel its investment in the next risky round of innovative activity. Some courts have recognized this important economic principle. The district court in New Jersey has said that a patent holder can demonstrate its irreparable harm by showing its diminished ability to invest in research and development due to the infringement.¹¹ The district court in Delaware has been more emphatic: "Without an injunction," the patent holder "would . . . suffer irreparable harm from being unable to use [its] lost . . . revenue to invest in research and development of new clinical indications . . . and development of other drugs."¹² In a subsequent case between two pharmaceutical companies, Chief Judge Leonard Stark of the Delaware court said that "the public has an interest in having what could be a somewhat earlier launch of a generic drug, which favors [the infringer], but the public also has an interest in protecting valid patents and encouraging investment in new pharmaceutical products."¹³ Despite the significance for the public interest of that tradeoff between the static and dynamic effects on economic efficiency, "[n]either side presented evidence on these points."¹⁴

Put differently, patent infringement reduces dynamic efficiency when it retards or prevents the commercialization of a new technology that an inventive firm would offer absent the infringement. By curtailing or aborting its investments in the new technology, the patent holder would forgo expected producer surplus from sales of the new product practicing that technology. Simultaneously, consumers would lose the surplus that they would have received from consuming that product had it been available in the market. That forgone surplus is a deadweight loss of dynamic efficiency, which typically exceeds by several orders of magnitude the more familiar static deadweight loss of allocative efficiency, depicted by the Harberger triangle,¹⁵ that

⁹ See J. Gregory Sidak & David J. Teece, *Dynamic Competition in Antitrust Law*, 5 J. COMPETITION L. & ECON. 581, 603–04 (2009); Howard A. Shelanski & J. Gregory Sidak, *Antitrust Divestiture in Network Industries*, 68 U. CHI. L. REV. 1, 10–11 (2001).

¹⁰ See Amil Petrin, *Quantifying the Benefits of New Products: The Case of the Minivan*, 110 J. POL. ECON. 705 (2002); Jerry A. Hausman, *Valuation of New Goods Under Perfect and Imperfect Competition*, in THE ECONOMICS OF NEW GOODS 209 (Timothy F. Bresnahan & Robert J. Gordon eds., Univ. of Chicago Press 1996).

¹¹ *Janssen Prods., L.P. v. Lupin Ltd.*, 109 F. Supp. 3d 650, 696 (D.N.J. 2014) (stating that 22 percent of revenues from sales of the patent holder's product "are reinvested into new research and development").

¹² *Vanda Pharms. Inc. v. Roxane Labs., Inc.*, No. 13-cv-01973, 2016 WL 4490701, at *16 (D. Del. Aug. 25, 2016), *appeal docketed*, No. 16-2707 (Fed. Cir. Sept. 9, 2016).

¹³ *Bayer Pharma AG v. Watson Labs., Inc.*, No. 12-1726-LPS, 2016 WL 7468172, at *3 (D. Del. Dec. 28, 2016).

¹⁴ *Id.*

¹⁵ Arnold C. Harberger, *Monopoly and Resource Allocation*, 44 AM. ECON. ASS'N PAPERS & PROC. 77 (1954).

arises when a monopolist marginally increases price along the demand curve for a mature product.

To comprehend the possible magnitude of harm from this deadweight loss of dynamic efficiency, suppose that an act of patent infringement caused the patent holder to postpone its launch of a new cancer drug from 2017 until 2021. The total harm from the four-year delay of the new cancer treatment is not only the destruction of the patent holder's forgone expected profit from selling the drug, but also the destruction of the consumer surplus experienced by cancer patients who would have bought the new drug during that period. Society's total irreversible loss of dynamic efficiency would be the sum of the patent holder's forgone expected profits and consumers' forgone surplus from using the new treatment during the four-year delay.¹⁶

Economic theory supplies a method for quantifying that irreversible loss by estimating the "virtual price" for the new product whose introduction into the market the act of patent infringement delays or aborts. Nobel laureate Sir John Hicks introduced the concept of the virtual price in 1940,¹⁷ and Jerry Hausman has refined its practical application in a series of influential articles since the mid-1990s.¹⁸ The intuition underlying the theoretical insights of Hicks and Hausman is that, until the new product actually enters the market, consumers cannot purchase it at any price, no matter how great their demand. The new product's price might as well be infinite. Hausman's empirical refinement estimated the virtual price that causes demand for the new product to be zero in equilibrium. Given estimates for the demand function and the supply function for the new product, the court could determine that product's virtual demand curve and assess the gains in surplus to the patent holder and to consumers from the product's introduction into the market.

However, it bears emphasis that, even though Hicks and Hausman have given courts a theoretically and empirically rigorous methodology to quantify the loss in consumer surplus from delaying or aborting the new product's introduction, the court still cannot reverse that permanent loss to consumers by awarding the patent holder (or anyone else, for that matter) a monetary

¹⁶ This kind of massive deadweight loss of consumer surplus is not unique to pharmaceuticals. For example, it would arise if a major contributor to a mobile communications standard responded to widespread infringement of its current portfolio of standard-essential patents by reducing or ending its investment in the next generation of the standard. See J. Gregory Sidak, *The Antitrust Division's Devaluation of Standard-Essential Patents*, 104 GEO. L.J. ONLINE 48 (2015); J. Gregory Sidak, *Evading Portfolio Royalties for Standard-Essential Patents Through Validity Challenges*, 39 WORLD COMPETITION 191 (2016); J. Gregory Sidak, *Testing for Bias to Suppress Royalties for Standard-Essential Patents*, 1 CRITERION J. ON INNOVATION 301 (2016).

¹⁷ John R. Hicks, *The Valuation of the Social Income*, 7 ECONOMICA 105 (1940).

¹⁸ See Hausman, *Valuation of New Goods Under Perfect and Imperfect Competition*, *supra* note 10; Jerry A. Hausman, *Valuing the Effect of Regulation on New Services in Telecommunications*, 1997 BROOKINGS PAPERS ON ECON. ACTIVITY: MICROECON. 1, 2; Jerry A. Hausman & J. Gregory Sidak, *A Consumer-Welfare Approach to the Mandatory Unbundling of Telecommunications Networks*, 109 YALE L.J. 417, 417-18 (1999); Jerry A. Hausman, *Sources of Bias and Solutions to Bias in the Consumer Price Index*, 17 J. ECON. PERSP., Winter 2003, at 23; Jerry A. Hausman & J. Gregory Sidak, *Google and the Proper Antitrust Scrutiny of Orphan Books*, 5 J. COMPETITION L. & ECON. 411, 414-16 (2009).

remedy. If, by constraining the patent holder's cash flow, an act of patent infringement delays the patent holder's introduction of a new cancer drug from 2017 to 2021, the forgone surplus to consumers from using the drug in 2017 never can be retrieved. Consuming more of the drug in 2021 does not reverse the hardship of having been denied the surplus that one would have derived from willingly buying and consuming the drug in 2017. And of course if patent infringement dissuades the patent holder from ever bringing the drug to market, then none of the consumer surplus under the virtual demand curve for that new drug ever materializes for cancer patients. That this sacrifice of consumer surplus is permanent and irreparable and enormous cannot be stressed enough.

III. THE SIREN SONG OF STATIC EFFICIENCY

It is fashionable if not orthodox within America's legal professoriate to consider the infringement of a valid patent socially beneficial in the belief that it increases static efficiency. Depending on the degree to which the market for the infringing product is imperfectly competitive, and assuming linear demand for simplicity, consumers can buy the infringing product at a price that excludes between half and all of the compensation that would flow to the patent holder under a per-unit royalty arising from a voluntarily negotiated license agreement for the patent in suit. At the market price, which would have eroded due to the presence of infringing substitutes, the demand for and output of the product practicing the patent in suit increase. So, as any Econ 1 student can tell us, consumer surplus increases as well.

Or does it? In Anchorage, Alaska stands Chilkoot Charlie's, a saloon that proclaims on its rooftop billboard: "We cheat *the other guy* and pass the savings on to you."¹⁹ A firm could just as easily invoke the static-efficiency apologia for patent infringement to justify its theft of all its productive inputs in the name of passing on the savings to consumers. Fortunately, the Federal Circuit has shown that it knows static-efficiency sophistry when it sees it. For example, in 2014 Judge Richard Taranto wrote for the court in *Aqua Shield v. Inter Pool Cover Team*: "An especially inefficient infringer—*e.g.*, one operating with needlessly high costs, wasteful practices, or poor management—is not entitled to an especially low royalty rate simply because that is all it can afford to pay without forfeiting or unduly limiting its profit if it uses the patented technology rather than alternatives."²⁰

¹⁹ See, *e.g.*, KTVA CBS 11 News, *Anchorage Police: 2 Shootings in Chilkoot Charlie's Parking Lot in 24 Hours*, Feb. 21, 2015, <http://www.ktva.com/anchorage-police-shooting-in-chilkoot-charlies-parking-lot-leaves-1-critically-injured-621/> (emphasis in original in photograph). Tom Hazlett introduced me to this story, which he regales in THOMAS W. HAZLETT, *THE POLITICAL SPECTRUM: THE TUMULTUOUS LIBERATION OF WIRELESS TECHNOLOGY, FROM HERBERT HOOVER TO THE SMARTPHONE* (Yale Univ. Press 2017).

²⁰ 774 F.3d 766, 772 (Fed. Cir. 2014).

By ignoring the temporal dimension of economic efficiency, the static-efficiency apologists for patent infringement implicitly assume a utopian state of technological omniscience in which, to borrow a quaint prediction from more than a century ago, “Everything that can be invented has been invented.”²¹ By that account, all investment in innovation that will ever be needed has by assumption already been sunk, such that no marginal disincentive for new investment in innovation will arise from the infringer’s appropriation of the current returns to patent holders. Nonsense. Never will everything that can be invented be invented. Never will the last sunk investment be made. To believe otherwise is to posit the end of history.

CONCLUSION

Patent infringement irreversibly obliterates wealth when it impedes society’s technical progress. Patent infringement does more than transfer wealth involuntarily from the patent holder to the infringer; it also harms third parties by devastating the surplus that consumers would derive from using the product practicing the new technology. Damages are impotent to cure that harm to the public interest. A court’s order of damages can no more recreate the wealth that has been or will be destroyed by an act of patent infringement than it can restore an ancient redwood after the axeman has felled it.

²¹ *The Coming Century*, PUNCH’S ALMANACK FOR 1899, vols. 116–17 (1899), <http://patentlyo.com/patent/2011/01/tracing-the-quote-everything-that-can-be-invented-has-been-invented.html>.