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Patents and Antitrust: Application to Adjacent Markets

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* The Networks, Electronic Commerce, and Telecommunications (“NET”) Institute, <http://www.NETinst.org>, is a non-profit institution devoted to research on network industries, electronic commerce, telecommunications, the Internet, “virtual networks” comprised of computers that share the same technical standard or operating system, and on network issues in general.

Patents and Antitrust: Application to Adjacent Markets

Nicholas Economides* and William N. Hebert **

August 2007

Abstract

We examine the intersection of patents and antitrust where a patent holder uses the monopoly power it possesses in the market for a patented product to exclude competitors in an adjacent market and attempt to monopolize or monopolize the adjacent market. The present scheme for awarding patents cannot judge when the issuance of a patent will lead to the appropriate balance between innovation and efficiency. Where a patent holder's invention uses an interface with adjacent products, the patent holder may be tempted to extend its patent monopoly into adjacent markets that depend upon the interface with the patented invention. Economic theory suggests that it is inappropriate to immunize a patent holder from antitrust liability when it attempts to extend its patent monopoly into adjacent markets, because it could decrease consumer surplus. Courts have expressed their reluctance to scrutinize a patent holder's innovations and design changes, because of the potential benefits of the innovations and their reluctance to second-guess the marketplace. However, applying traditional antitrust principles, courts have found that monopolists could be liable for unlawfully extending their monopoly positions into adjacent markets in the areas of computer peripherals and software applications; aftermarket for replacement parts, service and maintenance of durable goods; design changes to medical devices; and changes in drug formulas. While the patent laws provide a spur to innovation by granting limited monopoly rights, the antitrust laws curb the excessive reach of these monopoly rights by acting as a check on excessive expansion of the scope of the patent grant.

Key words: patents, antitrust, adjacent markets, complementarity, innovation, efficiency, aftermarket

JEL Classifications: K21, Q31, Q34, L42, L40, L12

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Patents and Antitrust: Application to Adjacent Markets

1. Introduction

Patents are a key aspect of intellectual property protection created to ensure sufficient incentives for innovative activity. A patent grant allows a patentee the right for a limited time to exclude others from using his invention. This right is offered as a reward to inventive activity, in exchange for the requirement of enabling disclosure.¹ In contrast, antitrust law attempts to protect consumers by deeming illegal certain types of business conduct that involve abuse of market and monopoly power, including various exclusionary actions, as well as conspiracies to limit competition, among others. Thus, at a first glance, there appears to be a significant conflict between patents and antitrust.

In this paper we assume that the goal of the present regulatory environment in the United States is to promote productive, allocative and dynamic efficiency.² Productive efficiency means costs are minimized. Allocative efficiency means that market prices are close to incremental production costs. Dynamic efficiency means that the appropriate amount of innovation, both in creating new products and in reducing costs of existing ones, is done. Competition in a market economy is the means to create, preserve, and enhance all three types of efficiency. Antitrust law safeguards the business environment so that competition can flourish.

¹ The patent law's disclosure requirement benefits society in two ways. First, the inventor's know-how becomes part of the public domain upon expiration of the patent. Second, others who know about the patent will innovate by designing around the patent, thus creating new products, or by designing improvements upon the patented invention during the term of the patent grant. The patent system should be contrasted with trade secret laws, although the stated policy of each legal regime is the encouragement of inventions. See *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 481 (1974). Under trade secret law, we permit a party to keep its competitive advantage and right to exclude others, so long as its proprietary information is found to have certain characteristics, *i.e.*, it has been kept confidential and it is subject to reasonable efforts to maintain its confidentiality. The trade secret owner can lose its protection only through proper means, such as lawful or accidental disclosure, independent invention by another, or discovery through reverse engineering. Unlike patents, trade secrets are protected indefinitely. The most famous example is the formula for Coca-Cola, which has been kept secret and provided significant commercial benefits to its owner, for over a century.

² Economists disagree on whether the aim of antitrust law is to protect consumers' surplus (net satisfaction of consumers from the operation of a market) or consumers' surplus plus profits of firms participating in the market. See Dennis W. Carlton and Randal C. Picker (2006), "Antitrust and Regulation," mimeo., Joseph Farrell & Michael Katz, "Welfare Standards in Competition Policy", *Competition Policy International* 2(2) (2006), Richard Gilbert, "Holding Innovation to an Antitrust Standard," *Competition Policy International* 3(1) (2007), and Louis Kaplow and Carl Shapiro, "Antitrust," forthcoming in *Handbook of Law and Economics*, A. Mitchell Polinsky & Steven Shavell, eds., Elsevier, 2007.

In some cases, public policy departs from relying on competition as the means of achieving efficiency.³ Patent grants establish legal monopolies with limited time duration. Competition in a market of a patented product is given up in the hope that monopoly profits guaranteed by patent protection in the short run will provide the appropriate incentive to engage in innovative activity. Departure from competition implies a loss of allocative and possibly productive efficiency.⁴ At least in theory, the grant of a patent trades a reduction in allocative and possibly productive static efficiency for an increase in innovative activity. Under the assumption that innovative activity is underprovided without patents, some increase in innovative activity will increase dynamic efficiency. Without a specific calculation that will depend of the particulars of the market(s) involved it is impossible to judge if the present patent law will lead to an under-provision, over-provision or the right intensity of innovative activity. The broad legal patent framework which does not calibrate patent duration and breadth by market is likely to often miss guiding to the right intensity of innovative activity, and therefore miss guiding the economy to maximum dynamic efficiency. There are substantial issues in the design and implementation of patent law that may prevent the market from achieving the appropriate amount of innovative activity that would precipitate dynamic efficiency.⁵

³ For example, the United States and many other countries depart from competition by imposing extensive safety and minimum quality standards regulations. Additionally, in specific industries, such as telecommunications, regulatory bodies have imposed pricing regulations, including maximum price regulation of various services, cost-based regulation on pricing of interconnection between competitors, and below cost pricing of basic telephone service with the aim to maximize subscription (to achieve “universal service”).

⁴ Economists measure alternative market organizations in terms of societal satisfaction or total surplus (“TS”), which is the sum of consumers’ satisfaction, that is, consumers’ surplus (“CS”), and producers’ profits or producers’ surplus (“PS”). With constant returns to scale technology of production, where unit cost remains constant for any level of production, competition among producers leads the market to maximization of total surplus. A monopolist in the same market would restrict output and result in lower total surplus. A monopolist would raise prices above marginal cost, thereby reducing allocative efficiency and may also reduce productive efficiency by not strictly minimizing costs, since it faces no pressure by competition. We should note that the theorem of total surplus maximization as a result of competition also holds as long as for sufficiently large levels of production unit costs decrease. However, when unit costs are decreasing for any level of production, competition does not necessarily result in total surplus maximization. The same is true in the presence of network effects (increasing returns to scale in consumption). For example, Nicholas Economides and Fredrick Flyer (1998), “Compatibility and Market Structure for Network Goods,” Discussion Paper EC-98-02, Stern School of Business, N.Y.U., <http://www.stern.nyu.edu/networks/98-02.pdf>, show that, with strong network effects, competition maximizes consumers’ surplus but monopoly maximizes total surplus.

⁵ From a public policy point of view, the question is not just whether a particular invention is given monopoly of a sufficient duration to guarantee sufficient incentives for this innovation. There is an additional question of whether later innovators also have sufficient incentives to innovate despite the rights conferred to an early innovator. Thus, the extent of monopoly conferred by a patent has to be limited skillfully so as not to interfere with the incentive to innovate of subsequent innovators. See also Richard J. Gilbert and Michael L. Katz (2003), “Should Good Patents Come In Small Packages? A Welfare Analysis of Intellectual Property Bundling” mimeo.

In this paper we will discuss issues that arise in the intersection of patents and antitrust. We focus on antitrust issues that arise when a patent holder uses the monopoly power it possesses in the market for the patented product to exclude competitors in adjacent markets, which is sometimes broadly called “monopoly leveraging.” The courts have identified several categories of conduct by patent holders that might give rise to claims of monopoly leveraging. Where the patent holder’s product uses an interface or interconnection with adjacent products, a patent holder can attempt to leverage its monopoly into adjacent markets by manipulating the interface. In these circumstances a patent holder is tempted to obtain revenues from adjacent markets by excluding others from selling products or offering services that require its interface. In these situations, the courts have considered and sometimes condemned monopolists’ efforts to control these markets through design changes and product changes which, in effect, extend in time or expand in scope the claims of the original monopoly granted by a patent or other intellectual property.

2. Patents

Valid and enforceable patents are assets. They give the owner a legal right to exclude others from using the invention claimed by the patent for a limited duration.⁶ The examiners who work at the United States Patent and Trademark Office (“USPTO”) examine patent applications to determine whether an invention is patentable. The patent examiners apply five principal criteria to determine patentability: (1) is the claimed invention patentable subject matter?⁷ (2) is the claimed invention novel?⁸ (3) is the claimed invention useful?⁹ (4) is the claimed invention non-obvious?¹⁰ and (5) has the inventor described the invention with enough particularity such that those skilled in the art will be able to make, use and understand the invention that the inventor made?¹¹ If the patent applicant meets the statutory criteria, the examiners have no discretion: they must issue the patent.¹² Issuance of a patent does not necessarily mean that the claimed invention is innovative; the patent will issue if the claimed invention is simply sufficiently different from what came before.¹³

⁶ Robert L. Harmon, *Patents and the Federal Circuit*. BNA Books, 8th ed. (2007) at 4-5.

⁷ 35 U.S.C. §101.

⁸ 35 U.S.C. §102.

⁹ 35 U.S.C. §101.

¹⁰ 35 U.S.C. §103.

¹¹ 35 U.S.C. §112.

¹² Robert L. Harmon, *Patents and the Federal Circuit*. BNA Books, 8th ed. (2007) at 4-5.

¹³ See Herbert Hovenkamp, Mark D. Janis and Mark A. Lemley (2007) “Innovation and Product Changes,” Chapter 12 in *IP and Antitrust*. Aspen Law & Business. at 12-26.

Once issued, the patent is presumed valid.¹⁴ Patent validity is tested in the crucible of litigation. Challengers to patent rights must overcome the presumption of validity. Decisionmakers, such as judges and juries, use this presumption as a procedural tool in resolving disputes. “The decisionmaker is required to begin by accepting the proposition that the patent is valid and then looking to the challenger for proof to the contrary.”¹⁵ The challenger bears the burden throughout any administrative proceeding or trial to prove that the patent is invalid; the burden never shifts to the patent holder to prove that the patent is valid.¹⁶

Examiners at the USPTO do not conduct any examination of the costs and benefits of conferring upon the inventor the right to exclude others from using the claimed invention. Patent examiners typically possess degrees as scientists, engineers or lawyers. They are not experienced policy makers, they do not see themselves as policy makers, and they have no authority to make policy. The examiners do not analyze the markets where the methods or products claimed by the patents will be sold. They do not inquire whether the patentee will practice the patent, by producing a product or using the claimed invention, or whether instead the patentee will sit on its patent rights and simply use the threat of enforcement to keep others from using its invention. They do not inquire whether the patentee will license others to use the invention and if so, at what rates. In sum, when the applicant is prosecuting his patent application, the examiner does not perform any cost/benefit analysis specific to the invention, the firms, the potential markets affected by the patent, or the impact of the patent in these markets.

The issuance of any patent in its nascent state suffers from additional defects. Patents give property rights with considerable uncertainty as to their validity.¹⁷ Every child born in our patent kingdom is a pretender to a throne. The duration of every patent is uniform, although economic theory shows that it should depend on the particulars of market and other factors. Patent rights are at best justified in law (but not in a case by case examination) based on *ex ante* expected profits. Patents may confer legal monopoly rights in more than one antitrust market. For example, an inventor who obtains a patent on a drug used to induce sleep might later find that it alleviates symptoms associated with diabetes. Or, the patentee might find that by slightly modifying the formula, it can obtain a new patent and exclude a potential rival from the old market and the new market. An appropriately worded patent will permit the inventor of this single drug to exclude others from using the drug in two or more different antitrust markets.

¹⁴ 35 U.S.C. § 382.

¹⁵ Robert L. Harmon, *Patents and the Federal Circuit*. BNA Books, 8th ed. (2007) at 34.

¹⁶ *Id.*

¹⁷ See Mark A. Lemley and Carl Shapiro (2005), “Probabilistic Patents,” *Journal of Economic Perspectives* 19 (2) (Spring 2005) 75–98.

As economists have long argued, and the United States Supreme Court definitively ruled in 2006, the ownership of a patent does not burden the patent owner with a presumption that it possesses monopoly power in any particular market.¹⁸ Eight years before the Supreme Court's antitrust jurisprudence caught up to economic theory, Congress had passed an amendment to the U.S. patent laws to relieve patent owners of the presumption that the ownership of a patent, without more, subjected them to claims of unfair competition by enforcing valid patents.¹⁹

The converse of the rule eliminating the congruence between patent ownership and market power, however, is that the antitrust market in which a patentee possesses market power might extend beyond the four corners of the patent grant. If the patentee has market power beyond the four corners of the patent, then the immunity from suit granted by Congress for enforcement of the patent should not extend to the full boundaries of the antitrust market. The key issues for patentees and economists is determining the borders of the lawful patent monopoly and the types of conduct that unlawfully leverages the patent grant beyond those borders. The importance of this question to policy makers is that appropriate enforcement will enhance consumer welfare. The importance of this question to the patent holder is that it might find itself subject to government enforcement action, criminal liability, private antitrust suits, civil damages and treble damages.

3. Intersection of Patents and Antitrust

Antitrust examines business *conduct* based on existing property rights. Any property right, based on real or intellectual property, can be abused in business conduct resulting in an antitrust violation. Thus, when property rights are well defined, there is nothing special in regard to rights arising out of a patent grant or other intellectual property protection. However, there are a number of issues that arise in antitrust enforcement from the vague definition and the leveraging of patents.²⁰

When patents and antitrust potentially clash, typically antitrust examination and enforcement will occur (i) after the grant of a patent; (ii) where a product based on a patent has successfully reached the market; and (iii) where the grantee managed to get monopoly power in a market. Thus, typical antitrust violations will occur for only few of the patents. Because of time separation between the granting of the patent and the potential antitrust violation and because of various other factors involved in creating

¹⁸ *Illinois Toolworks, Inc. v. Independent Ink, Inc.*, 547 U.S. 28, 42-43 (2006).

¹⁹ 35 U.S.C. § 271.

²⁰ We omit from discussion in this paper issues that pertain to conspiracies to restrain trade. We focus here only on single firm conduct and we do not discuss antitrust issues that arise from attempts to collude using patent pools as a pretext. See Richard Gilbert, "Antitrust for Patent Pools: A Century of Policy Evolution," *Stanford Technology Law Review*, April 2004, available at http://stlr.stanford.edu/STLR/Core_Page/ and Carl Shapiro (2003), "Antitrust Limits to Patent Settlements," *Rand Journal of Economics* 34 (2) 391-411 for a more extensive discussion of these issues.

products and achieving market power, it is very difficult for a conflict between the granting of a patent and antitrust rules to be anticipated at the time of the granting of a patent. No such consideration enters the granting of a patent. Antitrust examination and intervention are *ex post* to the patent grant. It is impossible to conceive an *ex ante* patent examination process that could address all of the defects which the USPTO's constituents have identified.

Because of the very significant uncertainty of the infringement, validity and enforceability of a patent some commentators have referred to patents as "lottery tickets."²¹ Inventors apply for patents on the off-chance that their invention might be a huge commercial success. The cost to apply for a patent -- \$10,000 to \$25,000 -- is low relative to the possible pay-off. In fact, most inventors are disappointed with their patents, since they cannot even muster the few hundred dollars to pay the maintenance fees over the life of the patent after it is issued.²² But once a patent is issued, any lawyer with a personal computer and an ISP can circulate threats of infringement, serve demand letters, and file lawsuits. To defend these lawsuits may cost hundreds of thousands or millions of dollars, even if they result in dismissal and a complete vindication of the alleged infringer's defenses.²³

Congress has sought to find a solution through legislation,²⁴ but the divergent interests of the patent system's constituents has thus far hobbled consensus on a legislative fix. The solution to the conflict between patents and antitrust will not be found in *ex ante* legislation or patent examination procedures. It must be found in *ex post* enforcement of the patent and antitrust laws.

Companies in different sectors of the economy have various and conflicting complaints of the patent system. Software companies complain that the USPTO should raise the standards for granting patents.²⁵ They complain that the USPTO grants too many patents. The costs to defend patent infringement suits on patents that purport to

²¹ Mark A. Lemley and Carl Shapiro, "Probabilistic Patents," *Journal of Economic Perspectives* 19 (2) (Spring 2005) 75–98, at 80-83.

²² *Id.* at 80.

²³ American Intellectual Property Law Association, "Report of the Economic Survey 2005," AIPLA/Association Research, Inc. (September 2005) at 22-26 (the "AIPLA Survey"). According to the most recent AIPLA Survey, which it publishes bi-annually, the median litigation cost of a patent lawsuit ranged from \$650,000 (where there was less than \$1.0 million in dispute) to \$4.5 million (where there was more than \$25 million at risk). Litigation costs have been increasing over time and the AIPLA's 2007 Survey will undoubtedly report even higher median costs to litigate patent infringement lawsuits.

²⁴ Recent past and current proposed legislation considered in Congress includes H.R. 2795 (Patent Reform Act of 2005), H.R. 5096 (Patents Depend on Quality Act), S. 3818 (Patent Reform Act of 2006) and H.R. 1908 and S. 1145 (Patent Reform Act of 2007).

²⁵ See, e.g., "Conflicts over Patent Reform," *Wall Street Journal*, June 6, 2007 at p. A1.

cover significant commercial endeavors – like the Internet – are expensive to defend. Likewise, the costs to defend patent infringement suits on patents that purport to cover minor, but common, business methods are likewise expensive to defend. Most software and technology companies argue for more stringent standards to obtain patents, or less onerous penalties for alleged infringement, such as eliminating enhanced damages for “willful” infringement, or making it easier to prove invalidity.²⁶ On the other hand, pharmaceutical and chemical companies argue for a strong patent regime.²⁷ These companies want the USPTO to issue patents on their applications, and they want enforcement to be easier, in order to protect the significant investment -- sometimes hundreds of millions of dollars – that they have incurred to bring a drug or treatment to market.²⁸

If we accept the premise that a valid and enforceable patent confers a limited monopoly – which is a premise United States law accepts – but the only check on potential abuse of that monopoly is the antitrust laws, then the statutory patent monopoly either grants the patentee immunity from the antitrust laws, or the patent is subject to the antitrust laws in markets adjacent to the invention claimed by the patent. If the patent confers upon the patentee absolute immunity from the antitrust laws, our inquiry is at an end. Any conduct of the patentee in adjacent markets is shielded from antitrust scrutiny. If, however, the patent does not confer absolute immunity, then at a minimum the antitrust laws apply to the patentee’s conduct in antitrust markets adjacent to the patent monopoly. It seems clear that the United States antitrust laws have adopted this policy.²⁹

4. Application to Adjacent Markets

To understand the issues we start with a simple case. Let us assume that a patented good confers legal monopoly rights in a single antitrust market A, and assume that the patent holder has monopoly power in A.³⁰ Assume further that there is an “adjacent” market to A that provides goods of type B that are complementary to A. The

²⁶ Id.

²⁷ Id.

²⁸ Id.

²⁹ In *United States v. Microsoft Corp.*, 253 F.3d 34 (D.C. Cir. 2001), the United States Department of Justice sued Microsoft for, among other things, exclusionary conduct in violation of Section 2 of the Sherman Antitrust Act on the grounds that Microsoft had used technology to discourage consumers from removing its Internet browser from its operating system, and it had commingled the browser code and operating system code so that removal of Microsoft’s browser would disable the entire operating system. Microsoft argued that its intellectual property authorized its conduct. Irrespective of Microsoft’s particular alleged conduct alleged by the DOJ, the Court of Appeals wrote, “Intellectual property rights do not confer a privilege to violate the antitrust laws.” Id. at 63.

³⁰ As we have discussed earlier, legal monopoly rights do not necessarily imply monopoly power in an antitrust market. A firm may with legal monopoly rights in a particular product may face considerable competition from close substitutes and therefore have no monopoly power.

patent in good A allows the monopolist of A to control the interface that determines the extent of complementarity between product A and products of type B. In particular, firm A can tweak the interface with B to exclude any producer of B or reduce the quality of type B goods of particular producers when used with A. Thus, firm A can use its monopoly in A to leverage and extend its monopoly to B. Then, we will argue, firm A's actions may be in violation of antitrust law, despite the patent. This scenario can be extended to a case where the patent holder does not have monopoly power in market A but can still control market B since the B-type products are only compatible with the particular patented A-type product.

There are many cases where these scenarios apply. For example, A may be a durable good and B may be maintenance services, parts, or supplies that are needed over the lifetime of product A. But sequentiality in the purchases of A and B is not crucial. For example, product A may be a patented computer operating system and B-type products are computer applications that work only with this operating system; we typically expect at least some applications purchases to occur simultaneously with the purchase of an operating system. There are many other examples of pairs of complementary goods fitting these scenarios.³¹

From an economics point of view, a well-functioning patent system should give a temporary monopoly franchise just to product A which is defined by the patented invention. This temporary monopoly in product A should be sufficient to provide the appropriate incentive for innovation. Society loses temporarily the consumers' surplus of A so that it is able to provide the exact and adequate incentive for the invention of product A. To provide a greater incentive, for example to add to the innovation incentive the consumers' surplus loss resulting from monopoly in B would be inappropriate. This is particularly important because there can be a large number of types of complementary goods. For example, a new patented drug can be complementary with a syringe to administer it, doctor services, hospital services, etc.

Among economists, there had been a considerable discussion on whether a monopolist in A is able to reap additional monopoly profits of a complementary good B. The so-called "Chicago School Theory" proposed first in the 1950s by Director and Levi states that there is a "single monopoly profit" in the combination of a sale of A with B, and therefore there cannot be anti-competitive reasons for leveraging from market A to market B.³² Therefore according to the Chicago theory, if firm A attempts to control market B, it must be for efficiency-enhancing reasons. Today, it is well understood that

³¹ In many such scenarios there are no network effects except those that arise from the direct complementarity between goods A and B. See Nicholas Economides (1996), "The Economics of Networks," *Internat'l Journal of Industrial Organization* 14 (2), 675-699. Pre-publication electronic copy available at http://www.stern.nyu.edu/networks/Economides_Economics_of_Networks.pdf.

³² See Aaron Director and Edward H. Levi (1956), "Law and the Future: Trade Regulation," *Northwestern University Law Review* 51, at 290.

the Chicago Theory holds only in very exceptional circumstances.³³ Therefore for almost all cases, it should be understood that profits of B are not captured automatically by a monopolist in A. The typical case is the “dual monopoly profits” case.

To the extent there is a single monopoly profit, for optimality of the patent system it may be sufficient to have a patent on good A since the patent holder receives the total A plus B monopoly profit just by monopolizing A. If, in contrast, the monopolist of A cannot reap the monopoly profits of B by just monopolizing A, (*i.e.*, we are in a dual monopoly profits case) it would not be appropriate for the patent system to reward the patent holder with monopoly in B and let him reap monopoly profits of B thereby reducing the consumers’ surplus of B. In both cases, it is not appropriate to award the B good profits to the patent holder of A through antitrust immunity: in the single monopoly profit case, the A monopolist has already reaped the B good monopoly profits through the patent in A, and in the dual monopoly profits case it is not appropriate for the A monopolist to receive it.

In the single monopoly profit case, the monopolist of A does not need to take anticompetitive leveraging action, since he already reaps monopoly profits of product B. In contrast, in the dual monopoly profits case, there are a number of anti-competitive actions that the monopolist of A can take. Many of these actions can be monopoly maintenance and tying actions that are available to a monopolist irrespective of the source of his monopoly power.³⁴ Additionally, there are anti-competitive actions that arise directly from the control of the interface between A and B because of the patent of A. We focus on actions that leverage market power from A to adjacent markets through the control of interfaces.³⁵

³³ For the monopolist in A to have no incentive to control market B, it is required that A and B are combined in a fixed and constant ratio, each buyer buys only one unit, there is perfect foresight, the market in good B is competitive and the goods are produced with constant returns to scale. These requirements are very restrictive. See also Joseph Farrell (2005), “Deconstructing Chicago on Exclusive Dealing,” *Antitrust Bulletin* 50, 465-480.

³⁴ In the dual profits case, many types of anti-competitive actions can be pursued. There is a large literature on tying, bundling, and monopoly maintenance examining these practices. See Barry Nalebuff (2003), “Bundling, Tying, and Portfolio Effects, Part 1: Conceptual issues,” Department of Trade and Industry Economics Paper No. 1, available at <http://www.dti.gov.uk/files/file14774.pdf>, Louis Kaplow and Carl Shapiro, “Antitrust,” forthcoming in *Handbook of Law and Economics*, A. Mitchell Polinsky & Steven Shavell, eds., Elsevier, 2007, Jeffrey K. MacKie-Mason and John Metzler (2002), ‘Links Between Vertically Related Markets,’ in J. Kwoka and L. White (eds.), *The Antitrust Revolution*, Patrick Rey and Jean Tirole (2007), “A Primer on Foreclosure”, in: M. Armstrong and R. Porter, eds., *Handbook of Industrial Organization*, vol. 3 (Elsevier Science Publishers, New York), forthcoming, available at <http://idei.fr/doc/by/tirole/primer.pdf>, and Michael Whinston (2006), *Lectures on Antitrust Economics* (MIT Press, Cambridge).

³⁵ In many traditional mechanical products, the interfaces can be observed directly or established through reverse engineering. In the world of software, interfaces are much more difficult to decipher and reverse engineer. Thus, even firms without patents can control interfaces. A good example of this is the interfaces of the Windows PC operating system with software applications. Applications developers have to rely on Microsoft information on these interfaces, commonly called Application Protocol Interfaces (“APIs”) because they cannot reverse engineer them. At the same time, Microsoft has strong interests to disclose these APIs to producers of complementary goods to Windows so that more applications get written

The antitrust laws provide a number of examples where companies have overreached their patent rights and have had their wrists slapped for trying to assert their patent monopolies into adjacent markets. This is despite the fact that the courts have exercised considerable restraint, because of three key concerns. First, judges and juries are not necessarily qualified to determine whether needs of the marketplace justify a particular product offering. Second, courts do not want to curb innovation by imposing restrictions on normal technological advancements. Third, courts have been reluctant to inquire into the patentee's state of mind when the patentee asserts that its patents give it a right to exclude competitors.

These concerns have led courts in two directions. One court has authorized judges and juries to view with skepticism a patentee's claim that its intellectual property rights give it unfettered control over adjacent markets.³⁶ Other courts preclude judges and juries from inquiring into the patentee's state of mind when it asserts its patent rights.³⁷ While these conflicts between courts and judges may be explained away by individual biases in favor or against patents in the core of valid and enforceable patent rights, there exists a middle ground where the antitrust laws trump the patent laws in adjacent markets. In these adjacent markets, the judges, juries and antitrust enforcers have more than sufficient skill and judgment to discern the difference between fair competition and unreasonable market manipulation.

We discuss four types of adjacent markets issues where the antitrust laws hold equal, if not superior, sway to the patent laws: (i) peripherals and complementary software markets; (ii) aftermarkets; (iii) interface design changes; and (iv) drug formulas. The anticompetitive conduct in each of these markets may differ, but the effect is the same: the patentee extends the patent monopoly beyond the four-corners of the patented claims.³⁸ In each of these markets, the patentee loses the immunity otherwise granted by the patent laws and regular antitrust principles govern the relationship between patentee/monopolist-alleged infringer/competitor.

a. Peripherals and Complementary Software Markets

A number of cases addressing the antitrust implications of a monopolist extending its intellectual property grants beyond the four-corners of the patent occurred in the

for Windows and the value and sales of Windows are enhanced. The only exception is when Microsoft also produces the complementary goods (for example Microsoft Office).

³⁶ *Image Technical Services v. Eastman Kodak Co.*, 125 F.3d 1195 (1997).

³⁷ *CSU, L.L.C. v. Xerox Corporation*, 203 F.3d 1322 (Fed. Cir. 2000), cert. denied, 531 U.S. 1143 (2001).

³⁸ We purposefully exclude the doctrine of equivalents, which permits a patentee to stretch the claims somewhat beyond the literal boundaries of the claimed invention. *Festo Corp. v. Shoketsy KKK Co.*, 535 U.S. 722 (2002). The markets we describe comprise those markets beyond the monopoly grant, even assuming it has been interpreted to its outermost borders by the doctrine of equivalents.

battles over computers and telephony, both in hardware and software. Early cases involved antitrust suits by peripheral device makers against IBM resulting from its product design changes to its computers. None of these early cases directly involved the assertion of patents by IBM against the peripheral parts competitors; that development occurred after the courts raised the importance of asserting patent and other intellectual property rights to justify certain business behavior.³⁹ For example, in *Telex Corp. v. IBM*,⁴⁰ the plaintiff initially filed an antitrust claim, which IBM met with a claim for trade secret misappropriation and copyright infringement of certain manuals.⁴¹ IBM did not assert infringement of any of its patents.

The judicial debate over the antitrust implications of product innovations has been framed by two conflicting views developed in these cases. One view is that a product change which has lessened competition for peripheral products is beyond antitrust scrutiny if the monopolist offers any justification for it. In this view, the courts refuse to dirty their hands by evaluating technical decisions and the pros and cons of different design decisions. In *Telex*, the plaintiff alleged that IBM had unlawfully monopolized the market for plug compatible peripheral products for IBM computers, such as information storage components, like magnetic tape drives, magnetic disk drives, magnetic drums; printers; and specialized memory units.⁴² The court found that IBM did not have monopoly power in the peripheral products plug compatible market, because competition existed between various system manufacturers, and because manufacturers of peripheral devices could easily shift production from IBM to non-IBM plus compatible peripherals, and vice versa.⁴³ IBM did not have market power in the relevant market, and its product changes, which led to lower (but above cost) prices, were not predatory.⁴⁴

Although the plaintiff in *Telex* challenged only lower prices associated with new products, and not the substantive compatibility changes themselves, plaintiffs in later cases focused on the design changes that they claimed IBM implemented in order to eliminate competition. In *ILC Peripherals v. IBM Corp.*,⁴⁵ the plaintiff was a maker of plug compatible external storage devices for IBM computers, such as disk drives, disk drive control units, and communications control units.⁴⁶ The plaintiff alleged that IBM

³⁹ See the discussion below regarding *Image Technical Servs. v. Eastman Kodak Co.*, 125 F.3d 1195 (1997).

⁴⁰ 510 F.2d 894 (10th Cir. 1975).

⁴¹ IBM did not appeal the district court's decision on its copyright claim. *Telex Corp.*, 510 F.2d at 928.

⁴² 510 F.2d at 899.

⁴³ 510 F.2d at 916, 919.

⁴⁴ 510 F.2d at 919-928.

⁴⁵ *ILC Peripherals v. IBM Corp.*, 458 F. Supp. 423 (N.D. Cal. 1978), *aff'd sub nom. Memorex v. IBM*, 636 F.2d 1188 (9th Cir. 1980).

had made changes to plugs and controllers on the computers to render the computers incompatible with the products of competitors in this market. The experts who testified for both sides disagreed on whether most of the changes were innovative or had no legitimate consumer benefit. After an extensive review of the product changes and the testimony, which in part showed that the plaintiff was not making devices that depended upon compatible plugs, the court held that the peripheral manufacturer had failed to carry its burden that IBM's conduct had been anti-competitive.⁴⁷

In a subsequent case, another judge attempted to formulate a general standard in Section 2 cases involving product design changes. *In re IBM Peripheral EDP Devices Antitrust Litigation*,⁴⁸ makers of peripheral devices compatible with IBM mainframe computers challenged IBM's design of its products, which prevented the use of the competitors' peripheral devices. The court held:

If the design choice is unreasonably restrictive of competition, the monopolist's conduct violates the Sherman Act. This standard will allow the factfinder to consider the effects of the design on competitors; the effects of the design on consumers; the degree to which the design was the product of desirable technological creativity; and the monopolist's intent, since a contemporaneous evaluation by the actor should be helpful to the factfinder in determining the effects of a technological change.⁴⁹

This case did not involve patents, but its holding is close to where the courts have ended up in cases that do involve patent holders whose conduct unreasonably restrains trade in adjacent markets.

Courts have found that a monopolist can be held liable for making changes to its interfaces so that competitors cannot sell their otherwise compatible products. In *Northeastern Tel. Co. v. American Tel. Co.*,⁵⁰ the court held that a monopolist could be found liable under the antitrust laws if it had intentionally designed a telephone network coupling device to impede competition. The reason for the scrutiny was the diminished functionality of the device. "In other circumstances, we might be reluctant to allow a jury to second-guess engineers' decisions as to the proper construction of a sophisticated

⁴⁶ 458 F. Supp. at 428.

⁴⁷ 458 F. Supp. at 439.

⁴⁸ 481 F. Supp. 965 (N.D. Cal. 1979), aff'd on other grounds, 698 F. 2d 1377, 1382 (9th Cir. 1983).

⁴⁹ 481 F. Supp. at 1003 (footnote omitted). See also *California Computer Prods. v. IBM Corp.*, 613 F.2d 727 (9th Cir. 1979) (plaintiffs challenged on antitrust grounds IBM's integration of disk drive controllers into its newest computers and the court rejected plaintiffs' claim, finding that the integrated products performed the same function as the old components about as well, but were significantly cheaper, which resulted in consumer benefit).

⁵⁰ 651 F.2d 76 (2d Cir. 1981).

piece of equipment. But in this case we cannot look to the reaction of the competitive market to determine whether one design is superior to another.”⁵¹ Thus the court in this case found antitrust liability because the interface was manipulated to diminish the quality of the complementary good when produced by competitors. While this case did not involve the assertion of patent rights, it stated a general proposition applicable to situations where market forces are not freely competitive.

Likewise in software, the courts have been willing to curb a monopolist’s efforts to exclude the use of peripheral applications other than its own. In *United States v. Microsoft Corp.*,⁵² the court examined Microsoft’s designs of its operating systems and its effects on competing software application providers, especially providers of Internet browsers that competed with Microsoft’s Internet Explorer, such as Netscape. In reviewing a district court’s opinion finding Microsoft liable of a wide range of anticompetitive conduct, the court identified two areas where Microsoft could have been found to have violated the antitrust laws. First, the court found that Microsoft used its Original Equipment Manufacturer (OEM) licenses with personal computer sellers such as Dell and Hewlett-Packard to prohibit the OEMs from installing rival browsers or modifying the operating system’s start-up sequence. Microsoft’s Internet Explorer would always be displayed to the user, instead of a rival’s browser. Second, the Court of Appeals found that Microsoft had taken steps to inextricably integrate its Internet Explorer with its operating system in a manner that discouraged end users from using competing Internet Web browsers.⁵³

Microsoft asserted as justifications that first, it owned the copyright to the operating system and the display, so it had the right to dictate how the system started up, and second, that integration of its operating system and its Internet Explorer were necessary for some purposes. In ruling on these issues, the court noted, “As a general rule, courts are properly very skeptical about claims that competition has been harmed by a dominant firm’s product design changes.”⁵⁴ The court elsewhere stated, “[A] monopolist does not violate the antitrust laws simply by developing a product that is incompatible with those of its rivals. . . . In order to violate the antitrust laws, the incompatible product must have an anticompetitive effect that outweighs any procompetitive justification for the design.”⁵⁵ Nonetheless, despite this professed skepticism about the government’s claims, the court upheld the district court’s finding that Microsoft had used anticompetitive design tactics.⁵⁶ In particular, the court held

⁵¹ 651 F.2d 76, 94-95 and n.29 (2d Cir. 1981).

⁵² 253 F.3d 34 (D.C. Cir. 2001).

⁵³ 253 F.3d at 59-64.

⁵⁴ 253 F.3d at 65.

⁵⁵ 253 F.3d at 75.

⁵⁶ 253 F.3d at 64.

that Microsoft could not assert its intellectual property rights as a copyright owner to exclude competition in the separate market for Internet Browsers.⁵⁷ The *Microsoft* court expressly weighed procompetitive effects of an interface design (or design change) with the anti-competitive implications of excluding competitors.

b. Aftermarkets: Parts, Service and Maintenance

A litigation shift occurred in the dynamics of private IP-antitrust litigation after the United States Supreme Court handed down its decision in *Eastman Kodak Co. v. Image Technical Services, Inc.*⁵⁸ In that case, the United States Supreme Court accepted the theory that a manufacturer of durable goods can be sued for illegally monopolizing the derivative aftermarket for parts and services for those goods and for refusing to deal with third-party independent service organizations (“ISOs”). In *Kodak*, the defendant

⁵⁷ 253 F.3d at 64-67. The Court of Appeals stated, “Microsoft’s primary copyright argument borders upon the frivolous. The company claims an absolute and unfettered right to use its intellectual property as it wishes: ‘If intellectual property rights have been lawfully acquired,’ it says, then ‘their subsequent exercise cannot give rise to antitrust liability.’ Appellant’s Opening Br. at 105. That is no more correct than the proposition that use of one’s personal property, such as a baseball bat, cannot give rise to tort liability.” *Id.* at 58-59. See also Harry First, “Microsoft and the Evolution of the Intellectual Property Concept,” 2006 *Wisconsin Law Review* 1369 (2006).

⁵⁸ 504 U.S. 451 (1992). In the wake of the Supreme Court’s *Kodak* decision, numerous lower courts considered whether there exist similar circumstances in which the equipment manufacturer had the ability to exercise unlawful monopoly power in the aftermarket for its goods. The results were mixed. For cases finding a potential antitrust violation under *Kodak*, see, for example, *Allen-Myland, Inc. v. International Business Machines Corporation*, 33 F.3d 194 (3rd Cir. 1994) (where IBM had instituted a new “net pricing” policy and bundled the price of installation labor with the price of parts for upgrades, the appropriate market in a monopolization case by a servicing company of IBM mainframe computers was the parts and services required for conversion and upgrade of IBM mainframe computers); *Virtual Maintenance, Inc. v. Prime Computer, Inc.*, 11 F.3d 660 (6th Cir. 1993) (*Kodak* applied where the defendant controlled the sale of software support for computer-assisted design programs and there existed evidence of price manipulation, unequal treatment of customers, and “lock-in” and high switching costs); *Yeager’s Fuel v. Pennsylvania Power & Light*, 953 F. Supp. 617 (E.D. Pa. 1997) (*Kodak* applied where a electrical utility got new home builders to agree to install electrical heat pumps, which locked-in home owners to electrical heat instead of gas, and the switching costs from heat to gas were high); *Collins v. Internat’l Dairy Queen, Inc.*, 939 F. Supp. 875 (M.D. Ga. 1996) (there existed a question of fact whether franchisees were illegally “locked in” to purchasing products from franchisor at unreasonably high prices). For cases finding no *Kodak* violation, see, for example, *Kentmaster Manufacturing Co. v. Jarvis Products Corp.*, 146 F.3d 691 (9th Cir. 1998) (antitrust complaint against manufacturer of specialty power tools and equipment in the slaughterhouse industry did not state a claim because allegations established that equipment and spare parts constituted a single product); *Brokerage Concepts, Inc. v. U.S. Healthcare, Inc.* (CCH) ¶72,099 (3rd Cir. 1998) (in an action by a third party administrator of health plans against a health maintenance organization, the court found no *Kodak* violation where the HMO conditioned a pharmacy chain’s continued participation in the HMO’s network of prescription providers by terminating the plaintiff; there was no evidence that the pharmacy was “locked in” to the HMO’s network due to high switching costs); *PSI Repair Services, Inc. v. Honeywell, Inc.*, 104 F.3d 811 (6th Cir. 1997) (there was no *Kodak* market where the defendant’s replacement parts policy had been “consistently maintained and generally known,” and therefore the primary equipment market was the relevant antitrust market for plaintiff’s Section 1 and Section 2 claims); *Queen City Pizza, Inc. v. Domino’s Pizza, Inc.*, 124 F.3d 430 (3rd Cir. 1997) (franchisees could not state a *Kodak* antitrust claim against franchisor as a matter of law).

manufactured photocopiers and microfilm equipment. A group of ISOs sued Kodak, alleging that it had used its monopoly in one market -- its installed base of reproduction machines -- to monopolize the aftermarket for goods and services of those machines. In the ensuing trial, the ISOs proved that Kodak had refused to sell them parts or to permit its customers to allow the ISOs to service Kodak's machines. Kodak raised as a defense that it had a valid business justification for refusing to deal with the ISOs because it held patents on its replacement parts for its equipment and copyrights on its diagnostic and service software. Kodak's witnesses testified, and its lawyers argued, that its intellectual property rights justified its refusal to deal with the ISOs, even though it had not affirmatively filed suit against the ISOs for patent or copyright infringement. Kodak's business justification defense at trial and on appeal was unsuccessful.

In the appeal from the trial, the Ninth Circuit in *Image Technical Services v. Eastman Kodak*,⁵⁹ addressed, for the first time, the relationship of intellectual property rights and the antitrust laws and whether a monopolist's refusal to deal with competing providers of complementary goods (the ISOs) could be justified by its patents and copyrights. The Ninth Circuit held that a monopolist who has achieved a dominant position through its patents and copyrights can violate the Sherman Act by exploiting that dominant position to attain a monopoly in another market. While patents and copyrights could be raised as a business justification for a refusal to deal, these intellectual property rights did not confer an absolute immunity from suit. The Ninth Circuit adopted a rebuttable presumption that the assertion of intellectual property rights constituted a valid business justification for any immediate harm to consumers. However, this presumption could be overcome by evidence that the assertion of intellectual property rights was a pretext that masked anti-competitive conduct. The Ninth Circuit held that, in appropriate cases, such as *Image Technical Services*, the antitrust laws will trump intellectual property rights.

After *Kodak*, defendants in antitrust cases began affirmatively to assert their patent and other intellectual property rights so that their rivals could not claim that their refusal to grant licenses was a mere "pretext." The effect has been that monopolists who own patents vigorously assert their intellectual property rights, particularly in cases where the rival might assert violation of the antitrust laws under a *Kodak* theory.

This strategy of asserting patent rights in antitrust actions has been successful and has resulted in at least one significant court opinion rejecting the "rebuttable presumption" articulated in *Image Technical Services*. In *CSU, L.L.C. v. Xerox Corporation*,⁶⁰ the plaintiff was an independent service company for Xerox photocopiers. Like Kodak, Xerox -- after freely selling parts to ISOs for many years -- developed a policy to stop selling parts to any ISO which was not an end-user of Xerox equipment. Xerox policed its end-users to ensure that they were not selling parts to ISOs. The ISOs continued to purchase parts from a majority-owned European subsidiary of Xerox, until

⁵⁹ 125 F.3d 1195 (1997).

⁶⁰ 203 F.3d 1322 (Fed. Cir. 2000), *cert denied*, 531 U.S. 1143 (2001).

Xerox forced it to stop selling parts to ISOs.⁶¹ Like Kodak, Xerox competed with ISOs in the service market. Like Kodak, Xerox had monopoly power in the relevant parts and service markets. And, like Kodak, Xerox owned patents on at least some of its parts (although this is not clear from the text of the opinion) and held copyrights to its diagnostic software, which was an essential component to servicing its machines. Xerox refused to sell any parts, or license its software, to ISOs.

The ISO plaintiff alleged that Xerox was attempting to leverage its monopoly power in the high volume equipment and parts markets to acquire and/or maintain monopoly power in the relevant service markets in violation of section 2 of the Sherman Act. Xerox contended that the plaintiff had not suffered any antitrust injury because the alleged injury was attributable to Xerox's lawful refusal to sell patented parts and copyrighted software. Xerox also contended that the plaintiff could not assert a patent or copyright misuse defense to Xerox's infringement counterclaims based on Xerox's unilateral refusal to deal. The trial court and the Federal Circuit Court of Appeals agreed with Xerox.

Declining to follow the Ninth Circuit's decision in *Image Technical Services* permitting a jury to consider Kodak's motives for refusal to deal with the ISOs, the court in *CSU v. Xerox* held, "We see no more reason to inquire into the subjective motivation of Xerox in refusing to sell or license its patented works than we found in evaluating the subjective motivation of a patentee in bringing suit to enforce that same right. In the absence of any indication of illegal tying, fraud in the Patent and Trademark Office, or sham litigation, the patent holder may enforce the statutory right to exclude others from making, using or selling the claimed invention free from liability under the antitrust laws. We therefore will not inquire into the subjective motivation for asserting his statutory rights, even though his refusal to sell or license his patented invention may have an anticompetitive effect, so long as that anticompetitive effect is not illegally extended beyond the statutory patent grant."⁶² The United States Supreme Court has not resolved the apparent conflict between *Image Technical Services* and *CSU v. Xerox*.

Setting aside the question of subjective motivation and intent, which created the divide between the decisions in *CSU v. Xerox* and *Image Technical Services*, there is at least one common thread: the courts agreed that a patent holder cannot use anticompetitive means to extend its patent rights beyond the statutory grant. In *CSU v. Xerox*, the Federal Circuit distinguished *Image Technical Services* as a tying case, but in essence agreed that a patent holder who unreasonably ventures beyond the boundaries of the patent grant could be held liable for antitrust violations. As the court in *CSU v. Xerox* reasoned, "Properly viewed within the framework of a tying case, [*Image Technical Services*] can be interpreted as restating the undisputed premise that the patent holder cannot use his statutory right to refuse to sell patented parts to gain a monopoly in a

⁶¹ For a complete description of the facts of the case, see *Independent Service Organizations Antitrust Litig.*, 989 F. Supp. 1131, 1133-1134 (D. Kan. 1997).

⁶² 203 F.3d at 1327-1328.

market beyond the scope of the patent. See, e.g., *Atari Games Corp. v. Nintendo of Am., Inc.*, 897 F.2d 1572, 1576, 14 U.S.P.Q.2D (BNA) 1034, 1037 (Fed. Cir. 1990) (“[A] patent owner may not take the property right granted by a patent and use it to extend his power in the marketplace improperly, i.e., beyond the limits of what Congress intended to give in the patent laws.”).⁶³ In *Image Technical Services*, the Ninth Circuit relied on its rebuttable presumption that the assertion of intellectual property rights constitutes a business justification to an alleged infringer’s antitrust claims. It permitted the challenger to the monopolist’s conduct to offer evidence to rebut the presumption.

c. Design Changes

One issue in the IBM plug compatible peripheral antitrust lawsuits was the plaintiffs’ challenges to IBM’s interface design changes. As discussed above, a monopolist might seek to control supply in the aftermarket for its products by making changes in the design of its primary product, thereby making it more difficult, if not impossible, for its competitors to produce complementary products. The courts have alternatively condemned and condoned this practice on antitrust grounds.

In *GAF Corp. v. Eastman Kodak Co.*,⁶⁴ the plaintiff competed with Kodak in the amateur film developing and print photography markets. The plaintiff contended that from 1955 to 1972, there developed an independent photofinishing network of small labs that developed film using Kodak C-22 chemistry and photofinishers, which printed Kodacolor film. As soon as plaintiff and other competitors gained a foothold in the market for C-22 color film developing and photofinishing, Kodak introduced new formulas that operated using new chemical reactions to develop the film. The plaintiff alleged that Kodak’s conduct forced independent photofinishers to convert from the old C-22 processing to the new Kodak C-41 processing. Plaintiff and other independent film suppliers were excluded from the market as a result.⁶⁵ Kodak argued that it possessed a nearly unfettered right to introduce new products, but the court disagreed. “[C]ontrary to Kodak’s contentions, that new product introductions by a monopolist are not *ipso facto* immune from antitrust scrutiny” and that a “new product introduction coupled with some associated conduct may constitute a § 2 violation.”⁶⁶

The court found that Kodak could be held liable. Explaining *Northeastern Telephone*,⁶⁷ the court stated:

⁶³ *CSU v. Xerox*, 203 F.3d at 1327.

⁶⁴ 519 F. Supp. 1203 (S.D.N.Y. 1981).

⁶⁵ 519 F.Supp. at 1224-1225.

⁶⁶ 519 F.Supp. at 1226.

⁶⁷ 651 F.2d 76.

The language of *Northeastern Telephone and Berkey* [*Photo v. Eastman Kodak Co.*], 603 F.2d [263] at 287 n.39 [(2nd Cir. 1979)], albeit limited, and cases from outside the Second Circuit, indicate that in scrutinizing design conduct, § 2 would merely require the monopolist's design to be "reasonable", rather than to be the design alternative least restrictive of competition. Thus, the "reasonableness" of the design of a monopolist's new products (vis-a-vis competitors' products which were technically linked to or dependent upon the monopolist's product) may be scrutinized under § 2 in cases in which "market forces cannot operate" that is, in cases in which a single firm controls the entire market or in which a monopolist engages in coercive conduct to affect consumer choice.⁶⁸

Where a monopolist in market A owes his monopoly to a patent, it follows that "market forces cannot operate" and a monopolist could be found to engage in coercive conduct affecting consumer choice by re-designing products to exclude competitors from market B.

Two recent cases have considered the antitrust implications of patents and re-designed products. In *C.R. Bard, Inc. v. M3 Systems, Inc.*,⁶⁹ a patent holder sued a competitor for infringing patents covering biopsy guns which mechanically injected a needle into the patient's body. Both the biopsy guns and the replacement needles were the subjects of patents. In the infringement suit, the competitor claimed that the patent holder had modified its patented biopsy guns and needles for the purpose of preventing the competitor's replacement needles from fitting the gun without an adapter. The jury, the trial judge, and two of the three judges on the Federal Circuit Court of Appeals found that the patent holder unlawfully maintained its monopoly position in the aftermarket for replacement needles by exclusionary conduct, *i.e.*, by modifying its patent gun in order to prevent the replacement needles of its competitors from fitting in its biopsy guns.⁷⁰ The Federal Circuit found, in essence, that the patent holder could not manipulate the interface between the patented biopsy guns and the replacement needs in order to control competition in the aftermarket for replacement needles.

In another medical device case, *Medtronic MiniMed Inc. v. Smiths Medical MD, Inc.*,⁷¹ a patent holder brought an action for infringement against a competitor in the markets for the sale of infusion pumps used to deliver insulin to diabetics, and the associated infusion "sets" that connected to the pumps. The infusion pumps were durable goods which lasted many years; the infusion sets were disposable and thrown out after a

⁶⁸ 519 F. Supp. at 1227-1229 and n.19.

⁶⁹ 157 F.3d 1340 (Fed. Cir. 1998).

⁷⁰ 157 F.3d at 1382.

⁷¹ 371 F. Supp.2d at 578.

few days. The defendant brought a counterclaim for antitrust violations, alleging that the patent holder had attempted to monopolize the market for infusion sets by re-designing the lock which acted as an interface between the infusion pumps and the infusion sets. The court rejected the competitors' claims. The patent holder held a patent on the new lock and the competitor claimed it had not produced new infusion sets compatible with the new lock because it was apprehensive about getting sued. The court found that the patent holder had not sued any other competitor for infringement of its patent on the new lock, and therefore until the competitor produced and sold infusion sets that were compatible with the patent holder's re-designed infusion pumps, it did not have standing to sue for antitrust violations. The competitor had not suffered an antitrust injury. The court also found that the competitor had failed to allege a claim for tying, because it had not adequately alleged that customers were coerced into buying the patent holder's infusion sets.⁷² In the course of reaching its decision, the court rejected the competitor's claim that the patentee had a duty to assist it: "Smiths argues that the design changes to the connection system undertaken by MiniMed could have been accomplished without removing the luer lock. . . . Absent evidence of anticompetitive conduct, however, it is not the role of the courts to determine how companies should innovate."⁷³

The court in *C.R. Bard* felt that judges and juries are competent to second-guess a patent holder's design decisions, and expressed skepticism at the patent holder's design changes, especially when the purpose of the change appeared to be to exclude competition in the market for replacement needles. By contrast, the court in *Medtronic* expressed skepticism about the competence of judges and juries to use antitrust law to regulate perceived product innovations. As shown by these two cases, courts are skeptical about the ability of judges and juries to make the proper delineation between patents and antitrust, but at the same time the courts are reluctant to give antitrust immunity to patent holders when they leverage market power in adjacent markets.

d. Changes in Drug Formulas

Akin to design changes, there exists for nearly every successful patented product a prospective future market for copycat, complementary, or generic products that the competitor sells under the monopolist's price umbrella. The monopolist will argue that its patent, or lawful extensions of its patent, exclude the potential competitor. At least one court has found that a competitor who charges a monopolist with changing its patented product to prevent the competitor from introducing a generic substitute was entitled to proceed with its complaint.

⁷² 371 F.3d at 584-586.

⁷³ 371 F.3d at 589.

In *Abbott Labs v. Teva Pharmaceuticals*,⁷⁴ a generic drug manufacturer claimed that the branded drug manufacturer intentionally made a series of allegedly insignificant changes to its drug as a way to keep the generic manufacturer from successfully obtaining Food and Drug Administration approval to sell the generic and successfully market it to buyers.⁷⁵ By analogy to other cases involving adjacent markets, the court reasoned that if the allegations were true, the defendant had altered the functioning of the marketplace and had denied consumers choices between drugs by manipulating the laws governing sales and marketing of generic drugs, all as part of a scheme to extend its monopoly into the future. By repeatedly shifting the formula of its drug, the branded drug manufacturer allegedly prevented its generic drug competitors from publishing their competing drugs in the “Orange Book” where information about approved generic drugs is disseminated to the market. Applying the rule of reason, the court permitted the generic competitors to proceed with their complaint, which would permit the court to conduct an inquiry into the costs and benefits of the defendant’s conduct.⁷⁶

Like the cases where a defendant of a durable good or software manipulates the interface or interconnection to extend its patent beyond the four corners of its original grant to block potential entrants to its market, the drug manufacturer allegedly changed the design of its branded drug in order to prevent generic manufacturers from establishing their fitness as substitutes for the branded drug.

5. Concluding Remarks

We examined the intersection and potential conflict of patents and antitrust. Patents grant monopolies of limited duration that may result in the patent holder having monopoly or market power in one or more antitrust markets. We discuss cases where a patent holder uses such market or monopoly power in the market for a patented product to exclude competitors in an adjacent market and/or attempts to monopolize or monopolizes the adjacent market. We discuss the role that interfaces connecting the patent grant market with an adjacent market play in leveraging market power. Economic theory suggests that it is inappropriate to immunize a patent holder from antitrust liability when it attempts to extend its patent monopoly into adjacent markets, because it could decrease consumer surplus. Generally, courts have been reluctant to examine in detail a patent holder’s innovations and design changes. However, applying antitrust law, courts have found that monopolists may be liable for unlawfully extending their monopolies into adjacent markets in the areas of computer peripherals and software applications; aftermarket for replacement parts, service and maintenance of durable goods; design changes to medical devices; and changes in drug formulas. Although the boundary between patents and antitrust is not clearly delineated, the courts are nonetheless reluctant

⁷⁴ 432 F.Supp. 2d 408 (D. Del. 2006)

⁷⁵ 432 F.Supp. 2d at 414.

⁷⁶ 432 F.Supp.2d at 422.

to give antitrust immunity to patent holders when they leverage market power in adjacent markets.

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