The Patent System and Competition

A Statement to the Federal Trade Commission/ Department of Justice Hearings on Competition and Intellectual Property Law and Policy in the Knowledge-Based Economy

Josh Lerner*

The U.S. patent system has undergone a profound shift over the past two decades. The strength of patent protection has been dramatically bolstered, and both large and small firms are devoting considerably more effort to seeking patent protection and defending their patents in the courts. Many in the patent community—U.S. Patent and Trademark Office officials, the patent bar, and corporate patent staff—have welcomed these changes. But viewed more broadly, the reforms of the patent system and the consequent growth of patent litigation have created a substantial "innovation tax" that affects some of America's most important and creative firms.[1]

Almost all formal disputes involving issued patents are tried in the Federal judicial system. The initial litigation must be undertaken in a district court. Prior to 1982, appeals of patent cases were heard in the appellate courts of the various circuits. These differed

*Jacob H. Schiff Professor of Investment Banking, Graduate School of Business Administration, Harvard University and Research Associate, National Bureau of Economic Research. Harvard Business School's Division of Research proved financial support. All opinions are my own.

[1]One question raised by this argument is as follows: if these obstacles are important, why has the share of R&D expenditures being undertaken by American firms substantially increased in recent years? The rapid pace of change in many facets of information technology may have created more opportunities. In addition, improvements in the management of innovation with established firms may have increased the efficiency of such spending (see Kortum and Lerner [1998] for a discussion).

considerably in their interpretation of patent law. Because few appeals of patent cases were heard by the Supreme Court, substantial differences persisted, leading to widespread "forum shopping" by litigants.

In 1982, the U.S. Congress established a centralized appellate court for patent cases, the Court of Appeals for the Federal Circuit (CAFC). As Robert Merges [1992] observes,

> While the CAFC was ostensibly formed strictly to unify patent doctrine, it was no doubt hoped by some (and expected by others) that the new court would make subtle alterations in the doctrinal fabric, with an eye to enhancing the patent system. To judge by results, that is exactly what happened.

The CAFC's rulings have been more "pro-patent" than the previous courts. For instance, the circuit courts had affirmed 62% of district court findings of patent infringement in the three decades prior to the creation of the CAFC, while the CAFC in its first eight years affirmed 90% of such decisions [Koenig, 1980; Harmon, 1991].

The strengthening of patent law has not gone unnoticed by corporations. Between 1988 and 2000, patent applications by U.S. corporations have more than doubled [U.S. Department of Commerce, 2001]. Furthermore, the willingness of firms to litigate patents has increased considerably: the number of patent suits instituted in the Federal courts has increased from 795 in 1981 to 2573 in 2001 [Administrative Office, various years]. These suits lead to significant expenditures by firms. For instance, I have estimated [1995] that patent litigation begun in 1991 led to total legal expenditures by U.S. firms that were at least 25% of the amount on basic research by these firms in that year. Litigation also leads to substantial indirect costs. The discovery process is likely to require the alleged infringer to

produce extensive documentation, time-consuming depositions from employees, and may generate unfavorable publicity. Its officers and directors may also be held individually liable.

As firms have realized the value of their patent positions, they have begun reviewing their stockpiles of issued patents. Several companies, including Texas Instruments, Intel, and Wang Laboratories, have established groups that approach rivals to demand royalties on old patent awards. In many cases, they have been successful in extracting license agreements and/or past royalties. For instance, Texas Instruments is estimated to have netted close to one billion dollars annually from patent licenses and settlements resulting from their general counsel's aggressive enforcement policy.

This has had two particularly striking consequences. The first has been the growth of litigation—and threats of litigation—between large and small firms.[2] This trend is disturbing. While litigation is clearly a necessary mechanism to defend property rights, the proliferation of such suits may be leading to transfers of financial resources from some of the youngest and most innovative firms to more established, better capitalized concerns. Even if the target firm feels that it does not infringe, it may choose to settle rather than fight. It either may be unable to raise the capital to finance a protracted court battle, or else may believe that the publicity associated with the litigation will depress the valuation of its equity.

[2]Several examples are discussed in Chu [1992]. Examples may include the dispute between Cetus Corporation and New England Biolabs regarding the taq DNA polymerase and that between Texas Instruments and LSI Logic regarding semiconductor technology.

In addition, these small firms may reduce or alter their investment in R&D. For instance, a 1990 survey of 376 firms found that the time and expense of intellectual property litigation was a major factor in the decision to pursue an innovation for almost twice as many firms with under 500 employees than for larger businesses [Koen, 1990]. These claims are also supported by my study [1995] of the patenting behavior of new biotechnology firms that have different litigation costs. I showed that firms with high litigation costs are less likely to patent in subclasses with many other awards, particularly those of firms with low litigation costs.

The second deleterious effect has been the emergence of individual inventors who seek to "hold up" established firms in their industries. In many cases, these individuals have received patent of dubious validity. For instance, in the financial services arena, individual inventors have received patents on the basic techniques of option pricing and exchange-traded stock indexes (both have which have been widely employed for decades), and are now seeking royalties for their "discoveries." (The discussion in Lerner [2002] has more details.) In many instances, established players have chosen to settle such disputes, not wishing to risk the uncertainty associated with trying a complex piece of intellectual property. Of particular worry has been the possibility that the individual will succeed in getting a preliminary injunction to shut down activity at the established firm [Lanjouw and Lerner, 2001].

These effects have been particularly pernicious in emerging industries. Chronically strained for resources, USPTO officials are unlikely to assign many patent examiners to emerging technologies in advance of a wave of applications. As patent applications begin flowing in, the USPTO frequently finds the retention of the few examiners skilled in the new technologies difficult. Companies are likely to hire away all but the least able examiners. These examiners are valuable not only for their knowledge of the USPTO examination procedure in the new technology, but also for their understanding of what other patent applications are in process but not awarded. (A large fraction of U.S. patent applications are held confidential until time of award.) Many of the examinations in emerging technologies are as a result performed under severe time pressures by inexperienced examiners. Consequently, awards of patents in several critical new technologies have been delayed and highly inconsistent. These ambiguities have created ample opportunities for firms that seek to aggressively litigate their patent awards. The clearest examples of this problem are the biotechnology and software industries. In the latter industry, examples abound where inexperienced examiners have granted patents on technologies that were widely diffused but not previously patented [see, for instance, the many examples chronicled in Aharonian, 2002].

It might be asked why policy-makers have not addressed the deleterious effects of patent policy changes. The difficulties that Federal officials have faced in reforming the patent system are perhaps best illustrated by the efforts to simplify one of the most arcane aspects of our patent system, the "first-to-invent" policy. With the exception of the Philippines, all other nations award patents to firms that are the first to file for patent

protection. The U.S., however, has clung to the first-to-invent system. In the U.S., a patent will be awarded to the party who can demonstrate (through laboratory notebooks and other evidence) that he was the initial discoverer of a new invention, even if he did not file for patent protection until after others did (within certain limits). A frequently invoked argument for the first-to-invent system is that this provides protection for small inventors, who may take longer to translate a discovery into a completed patent application.

While this argument is initially compelling, the reality is quite different. Disputes over priority of invention are resolved through a proceeding before the USPTO's Board of Patent Appeals and Interferences known as an interference. The Board will hold a hearing to determine which inventor first made the discovery.

The interference process has been characterized as "an archaic procedure, replete with traps for the unwary" [Calvert, 1980]. These interferences consume a considerable amount of resources: the adjudication of the average interference is estimated to cost over one hundred thousand dollars [Kingston, 1992]. Yet in recent years, in only about 55 cases annually has the party that was second-to-file been determined to have been the first-to-invent [Calvert and Sofocleous, 1992]. Thus, the U.S. persists in this complex, costly, and idiosyncratic system in order to reverse the priority of 0.03% of the patent applications filed each year.

But this system has proved very resistant to change. At least since 1967, proposals have been unsuccessfully offered to shift the U.S. to a first-to-file system. In January 1994,

for instance, former USPTO Commissioner Bruce Lehman was forced to withdraw such a proposal. While the voices raised in protest over his initiative—as those opposing earlier reform attempts—were led by advocates for small inventors, it is difficult not to conclude that the greatest beneficiary from the first-to-invent system is the small subset of the patent bar that specializes in interference law.

It may be thought puzzling that independent inventors, who are generally unable to afford costly litigation, have been so active in supporting the retention of first-to-invent. A frequently voiced complaint is that small inventors take longer to prepare patent applications, and hence would lose out to better-financed rivals, in a first-to-file world. This argument appears to be specious for several reasons. First, economically important discoveries are typically the subject of patent filings in a number of countries. Thus, there is already an enormous pressure to file quickly. Second, the recent reforms of the U.S. system have created a new provisional patent application, which is much simpler to file than a full-fledged application. Finally, as former Commissioner Lehman notes, many most vocal independent inventors opposing patent reform are "weekend hobbyists . . . [rather than representatives of] knowledge-based industries" [Chartrand, 1995].

As this case study suggests, the failure of Federal reform efforts is due to several factors. First, the issues are complex, and sometimes difficult to understand. Simplistic claims frequently cloud these discussions. For instance, because firms use patents to protect innovations, it is frequently argued that a stronger patent system will lead to more innovation. Second, the people with the greatest economic stake in retaining a litigious and

complex patent system—the patent bar—have proven to be a very powerful lobby. The efforts of the highly specialized interference bar to retain first-to-invent is a prime example. Finally, the top executives of technology-intensive firms have not mounted an effective campaign around these issues. The reason may be that the companies who are most adversely affected are small, capital-constrained firms who do not have time for major lobbying efforts.

Thus, an important policy concern is that we avoid taking steps in the name of increasing competitiveness that actually interfere with the workings of innovative businesses. The 1982 reform of the patent litigation process may well have had exactly this sort of unintended consequence. At the very least, steps to enhance the quality of patents being issued are certainly needed.

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