

U.S. House of Representatives
Committee on the Judiciary
Subcommittee on Courts, the Internet and Intellectual Property
Oversight Hearing on the Patent System
“American Innovation at Risk: The Case for Patent Reform”
February 15, 2007

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My name is Adam B. Jaffe. I am Fred C. Hecht Professor in Economics and the Dean of Arts and Sciences at Brandeis University in Waltham, Massachusetts. I am the co-author (with Prof. Joshua Lerner of Harvard University) of Innovation and Its Discontents: How our Broken Patent System is Endangering Innovation and Progress, and What to do About it (Princeton University Press, 2004). My testimony today is on my own behalf, and does not necessarily represent the views of Brandeis University or Prof. Lerner.

Over the course of the nineteenth and twentieth centuries, the United States evolved from a colonial backwater to become the pre-eminent economic and technological power of the world. The foundation of this evolution was the systematic exploitation and application of technology to economic problems: initially agriculture, transportation, communication and the manufacture of goods, and then later health care, information technology, and virtually every aspect of modern life.

From the beginning of the republic, the patent system has played a key role in this evolution. Based in the Constitution itself, and codified in roughly its modern form in 1836, the patent system was an essential aspect of the legal framework in which inventions from Edison’s light bulb and the Wright brothers’ airplane to the cell phone and Prozac were developed.

Much popular discussion of the patent system emphasizes its role in creating an economic incentive for the creative act of invention. From an economic perspective, this incentive for invention is not paramount, because creativity seems to be inherent in human nature, making a flow of new creative ideas likely under any incentive system. But a creative idea does not help society, unless it is taken further and converted to a commercially useful new product or process. And this stage of converting inventive ideas into real products and processes is very costly and very uncertain. The economic function of the patent system is to provide a measure of predictability and protection to this expensive and risky process of product and process development. At such, it lies at the very heart of technological process, which is in turn the primary engine of economic growth.

In the last two decades, however, the role of patents in the U.S. innovation system has changed from fuel for the engine to sand in the gears. Two apparently mundane changes in patent law and policy have subtly but inexorably transformed the patent system from a shield that innovators could use to protect themselves, to a grenade that firms lob indiscriminately at their competitors, thereby increasing the cost and risk of innovation rather than decreasing it.

Examples of dysfunctional patent behavior have become staples of the business and popular press. They range from the amusing and economically irrelevant, to not-so-funny cases that seriously threaten important technologies in important industries:

- Patents on inventions that are trivially obvious, such as the “Method for Swinging on a Swing,” “invented” by a five-year-old, and “User Operated Amusement Apparatus for Kicking the User’s Buttocks” (“invented” by a supposed grown-up);
- Patents in areas new to patenting, but covering purported discoveries familiar to practitioners and academics alike, such as Amazon.com’s attempt to prevent Barnesandnoble.com from allowing customers to buy books with a single mouse-click, and a bright MBA student’s patents on an option-pricing formula published in the academic finance literature two decades earlier;
- Patents that have become weapons for firms to harass competitors, such as the decade-long effort by Rambus, a semiconductor designer, to control computer memory technology by making sure that a long string of patents, all derived from a single 1990 patent application, incorporated important features of an industry-wide standard developed through a voluntary industry standard-setting association;
- Litigation by patent-holders who are not themselves market competitors, that hold up or impose huge costs on innovative, commercially successful products, such as the \$612 million dollar settlement that was necessary to prevent patent litigation from shutting down the Blackberry handheld device.

In the last several years, a variety of groups concerned with different aspects of public policy related to innovation have undertaken studies and issued reports calling for major reform of the patent system. These include the Federal Trade Commission (U.S. Federal Trade Commission, 2003, cited hereinafter as “FTC Report”), and the Board on Science, Technology and Economic Policy of the National Research Council (Merrill, Levin and Myers, 2004, cited hereinafter as “STEP Report”). After the issuance of the FTC Report and the STEP report, the American Intellectual Property Law Association (AIPLA) joined with the FTC and STEP Board to sponsor a series of “Town Meetings” across the country in 2005, and the AIPLA endorsed many of the reform recommendations of the FTC and the STEP Board. This subcommittee has also, of course, been active in this issue, with hearings and proposed legislation that has garnered bipartisan support.

In my testimony today, I will summarize the background for these discussions and discuss why patent policy reform is so crucial to our national well-being. Since I understand the subject of this hearing to be the “Case for Patent Reform” rather than the details of such reform, I will discuss the substance of reform only in the most general terms, but specific reform recommendations are discussed at length in my book with Prof. Lerner.

Patent Policy Developments over the Last Two Decades

The origin of today’s problems goes back to 1982, when the process for judicial appeal of patent cases in the federal courts was changed, so that such appeals are now all heard by the Court of Appeals for the Federal Circuit (“CAFC”), rather than the twelve regional courts of appeal, as had previously been the case. And in the early 1990s, Congress changed the structure of fees and financing of the U.S. Patent and Trademark Office (PTO) itself, trying to turn it into a kind of service agency whose costs of operation are covered by fees paid by its clients (the patent applicants).

It is now apparent that these seemingly mundane procedural changes, taken together, have resulted in the most profound changes in U.S. patent policy and practice since 1836. The CAFC has interpreted patent law to make it easier to get patents, easier to enforce patents against others, easier to get large financial awards from such enforcement, and harder for those accused of infringing patents to challenge the patents’ validity. At roughly the same time, the new orientation of the patent office has combined with the court’s legal interpretations to make it much easier to get patents. However complex the origins and motivations of these two Congressional actions, it is clear that no one sat down and decided that what the U.S. economy needed was to transform patents into much more potent legal weapons, while simultaneously making them much easier to get.

An unforeseen outcome has been an alarming growth in legal wrangling over patents. More worrisome still, the *risk* of being sued, and demands by patent holders for royalty payments to avoid being sued, are seen increasingly as major costs of bringing new products and processes to market. Thus the patent system—intended to foster and protect innovation—is generating waste and uncertainty that hinder and threaten the innovative process.

The growth in the sheer magnitude of the patent phenomenon has been breathtaking. The weakening of examination standards and the increase in patent applications has led to a dramatic increase in the number of patents granted in the U.S. The number of patents granted in the U.S., which increased at less than 1% per year from 1930 until 1982 (the year the CAFC was created), roughly tripled between 1983 and 2001 (from 62 thousand per year to over 180 thousand per year, an annual rate of increase of about 6%). The total number of patents granted peaked at about 187 thousand in 2003, and seems to have leveled off or perhaps declined a bit since then (The 2005 total was 158 thousand; the number for 2006 is

not yet available.) Applications, too, have ballooned, from less than 120 thousand in 1982, to 418 thousand in 2005, with no sign of slowing down.¹

While some of this increase appears to reflect real growth in innovation, it is clear that a large part of the increase is a response to the increased laxity of the PTO, which grants a significantly larger fraction of the applications it receives than do its counterparts in Europe and Japan. More worrisome still is a dramatic and inexorable increase since the early 1990s in the rate of litigation around patents. The number of patent cases filed has doubled in a decade and continues to rise. And the cost of defending a patent suit has risen as well; a patent infringement allegation from a competitor can now mean legal fees in the millions. For an under-capitalized startup, this prospect creates an overwhelming pressure to settle even frivolous complaints. Consumers therefore have less access to new products—from lifesaving drugs to productivity-enhancing software—than would be the case if innovative companies were not distracted from innovation by litigation and fear of litigation.

Much public attention has focused on the expansion of patenting into areas where it was previously unimportant or non-existent, such as biotechnology, software and business methods. Indeed, some of the worst abuses are in these areas. But concern about specific technologies potentially masks the deeper, fundamental problem. The incentives in the system now encourage frivolous applications, cursory review of those applications by the PTO, and indiscriminate filing of patent infringement suits as a generic competitive weapon. To get the system back on track, the system must be changed so that its incentives discourage frivolous applications, encourage rigorous patent examination, and discourage patent litigation where there is not a true invention to protect.

Goals and Objectives

While different analysts of the patent landscape have emphasized different aspects of the patent policy problems, there is general agreement on broad goals for reform of the system:

*Improve patent quality.*² As illustrated by examples discussed above, people are getting patents for inventions that are not new and/or are obvious. One way to solve this, of course, would be to make it much harder to get a patent on anything. If we did that, the few patents that did issue would be of very high quality, in the sense of being very deserved by the applicant. But the objective of patent quality has to be more than just making sure bad patents *don't* issue. It has to include also making sure that inventors *do* get patents when they have a truly novel, non-obvious invention, that such patents are processed relatively quickly and reliably, and that once granted they provide an adequate property right to protect subsequent investment in the invention.

¹ http://www.uspto.gov/web/offices/ac/ido/oeip/taf/us_stat.htm

² See STEP Report, pp 87-94.

Reduce uncertainty. A primary objective of reform should be to reduce the uncertainty that now pervades many aspects of the patent system. (Ironically, the only aspect of the patent process that has become more certain is the application process itself, as the ultimate granting of some patent from each original application has become almost a sure thing!) The sand in the gears of the innovation machine is that companies and individuals must constantly fear that their research and product development may come to naught, because someone is going to assert an as-yet unknown or untested patent against them. Further, when such an assertion of patent infringement is made, the uncertainty about the ability to defend against that assertion often leads either to abandonment of the allegedly infringing technology, or to an agreement to pay possibly unnecessary royalties.

Keep costs under control. In FY 2006, the Patent Office spent about \$1.7 Billion for its operations. In recent years, Congress has increased PTO fees and budgetary appropriations, thereby responding to one aspect of the recommendations of groups such as the FTC, the STEP Board and the AIPLA. It is important to remember that appropriations to the PTO represent only a small fraction of what society spends on the patent system. Patent applicants spend several times that amount, and patent litigants billions more. These resources might be well spent, if they achieved a reasonably smoothly functioning system. But the system is not working well, and it is reasonable to wonder whether we need to invest more of society's resources in the patent process. We need to look for solutions that go beyond throwing money at the problem.

Some Simple Truths

The next step towards reform is to understand some basic realities about the innovation process.

Mistakes will always be with us

Patent examination is never going to be perfect. Examiners are human. More important, there is an essentially irreducible aspect of judgment in determining if an invention is truly new. After all, even young Albert Einstein faced challenges while assessing applications as a "Patent Examiner-Third Class" in the Swiss Patent Office (Clark, 1973). Therefore, we cannot hope to have a system in which no "bad" patents ever issue. What is important is to have a system with fewer bad patents. And, since there will always be mistakes, it is important to have a system that functions reasonably well despite the issuance of some bad patents.

At current application rates, it would be very expensive to give all patent applications an examination sufficiently thorough to reduce significantly the problems with bad patents being issued. Now, the patent system is important, so it is possible that spending several billion additional dollars on the PTO would be worthwhile for society. But this kind of dramatic increase in PTO resources does not seem very realistic in the current fiscal environment. Fortunately, it is also not necessary to expend the resources necessary to provide very reliable examination for *all* patent applications.

Much more chaff than wheat

The first step to understanding why greatly increasing the resources for examination is not the best solution to the problem is to understand that most patents are, and always will be, worthless and unimportant. This is not a feature of the patent office; it is a feature of the innovation process. It is partly due to the human tendency for us each to think that our ideas are better than other people think they are. But it also reflects a deeper attribute of the process of technological development: the significance of a new idea usually cannot be known when it is first developed, because that significance depends on subsequent developments, both technological and economic. Many, many, “good” ideas are patented that never actually turn out to be worth anything. It is not that they shouldn’t have been patented to begin with. It’s just that for every invention with lasting technological or economic significance, there will always be dozens or hundreds of ideas that seemed *potentially* worthwhile, but which eventually proved to be valueless.

The fact that almost all patents are ultimately worthless has an important implication for the “patent quality” problem. If most patents are doomed to be consigned to the dustbin of technological history, it can’t make sense to spend a lot of resources to make sure that they all receive very high quality examination before issuing. The legions of inventors and patent attorneys may not like to think about this, but for the vast majority of patent applications, it will simply never matter—either to the inventor, her employer, or competitors—whether the patent is allowed to issue or not.

“Rational Ignorance”

If careful examination is expensive, and the vast majority of patents will never matter to anyone, then it would be inefficient to expend society’s resources on careful examination of all patent applications. In the colorful phrase of Mark Lemley (2002), we can think of the poor quality of patent examination as representing “Rational Ignorance,” by which he means that society is rationally choosing to remain ignorant about which patents really should be granted by the PTO. Lemley argues that it is, in fact, reasonably efficient to simply accept that PTO examination will be of poor quality, and that the cases that really matter will have to be sorted out in the courts. Court cases are expensive, but because only the small fraction of patents that matter will ever get litigated, Lemley argues that the cost of litigation is, overall, efficient.

I agree with Lemley that it would be inefficient to provide thorough examination for all applications at the current rate of patent application. I disagree, however, that the current situation is acceptably efficient. First, while the out-of-pocket cost of litigation may be tolerable, the intangible cost of a system with pervasive low-quality patents is much higher than just the cost of paying lawyers to file and defend patent cases. The uncertainty that the current system creates for all parties regarding who can legally use what technologies is a cost that is very hard to quantify, but is surely significant. Talk to anyone involved in trying to commercialize new technologies, and you are likely to hear complaints about the headaches and uncertainty created by overlapping patent claims. Further, this uncertainty undermines everyone’s incentives to invest in new technology. From the perspective of society as a whole, the loss of new products and processes that

never make it to market, or that gain a toehold and are then abandoned after a threatened patent fight, is much larger than the visible costs of patent litigation. And, fortunately, there are changes that could be made in the system that would improve patent quality without requiring dramatic increases in the resources used in the examination process.

Inventors respond to how the Patent Office behaves

The key to more efficient patent examination is to go beyond thinking about what patent examiners do, to consider how the nature of the examination process affects the behavior of inventors and firms. To put it crudely, if the patent office allows bad patents to issue, this encourages people with bad applications to show up. While the increase in the rate of patent applications over the last two decades is driven by many factors, one important factor is the simple fact that it has gotten so much easier to get a patent, so applications that never would have been submitted before now look like they are worth a try. Conversely, if the PTO pretty consistently rejected applications for bad patents, people would understand that bad applications are a waste of time and money. While some people would still try—either because they aren't smart enough to *know* they have a bad application, or because they are willing to take a roll of the dice—the number of applications would likely be considerably fewer than it has been in recent years.

Get information to flow into the PTO

Another important aspect of incentives has to do with information: who has it, and what do they do with it? Much of the information needed to decide if a given patent application should issue—particularly information about what related technologies already exist—is in the hands of competitors of the applicant, rather than in the hands of the PTO. And there are strong incentives for firms to share this information. If a competitor of mine has filed a patent application, the last thing I want to see is for them to be issued a patent on an application that would have been rejected if the PTO had known about my technology. I would thus have a strong incentive to provide this information, if only the PTO would give me an opportunity for input, and if taking advantage of such an opportunity does not create strategic disadvantages for me down the road. So creating opportunities of this sort is another way that the system could exploit the incentives of private parties in order to increase efficiency.

Potential litigants respond to how the courts behave

When the CAFC issues rulings that increase the chance of the patentee prevailing in an infringement suit, the consequences of this change are not limited to possible changes in the outcome of specific cases. Such a change in perceived success probabilities changes what disputes are, in fact, litigated. Conversations with attorneys involved in patent disputes make clear that the CAFC's strengthening of the offensive and defensive weapons of the patentee has significantly increased patentees' willingness to bring suit. Similarly, the change has significantly decreased the willingness of accused infringers to fight, even when they believe that the patents being used to threaten them are not valid. In particular, firms with highly successful products—when faced with a jury trial over complex issues of novelty and obviousness, and the risk that defeat might

mean large penalties for willful infringement and/or an injunction shutting down their product—may feel that they have no rational business choice but to pay a ransom to avoid litigation. When this happens, the cost of innovation rises and society is the loser. Constraining the growth in litigation, and the uncertainty created for all innovators by the risk of suit, will require a change in these incentives.

Building Blocks of Reform

There are three key conceptual pieces for thinking about patent policy reform:

1. Investigate ways to create incentives and opportunities for parties that have information about the novelty and obviousness of inventions to bring that information to the PTO when it is considering a patent grant.
2. Consider the possibility for multiple levels of review of patent applications, with the time and effort expended escalating as an application proceeds to higher levels, so that money is not wasted on unimportant patents, but sufficient care is taken to avoid mistakes where the stakes are high.
3. Address the balance of incentives and opportunities for patent holders and alleged infringers in the context of litigation. People with valid patents that are being infringed must have opportunity to seek redress, but the current system makes it too easy for patent holders to use threatened litigation—even when based on patents of dubious validity—too risky for alleged infringers to fight.

The first two of these concepts are aimed at making the PTO more effective at reasonable cost. The third addresses the reality that the best of all possible PTOs will still make mistakes, and so we need a court system that is capable of rectifying those mistakes.

Effective reform must start with the recognition that much of the information needed to decide if a given application should be approved is in the hands of competitors of the applicant, rather than the PTO. A review process with multiple potential review levels efficiently balances the need to bring in outside information with the reality that most patents are unimportant. Multilevel review, with the barriers to invoking review and the thoroughness of that review both increasing at higher levels, would naturally focus attention on the most potentially important applications. Most patents would never receive anything other than the most basic examinations. But for those applications that really mattered, parties would have an incentive and opportunities to bring information in their possession before the PTO, and the PTO would have more resources to help it make the right decision. Although there is disagreement about the details, implementation of a review procedure or procedures of this kind has been endorsed by the FTC, the STEP Board and the AIPLA.

If bad patents with important consequences were weeded out by the PTO, the incentive to file frivolous applications in the first place would be reduced. This would break the current vicious cycle in which inventors are induced to make marginal applications by

their likelihood of success, and the resulting flood of applications overwhelms the patent office and makes it harder to separate the wheat from the chaff.

Breaking the vicious cycle of bad examination and bad applications is the key to reform of the patent review process. But there are always going to be mistakes, and so it is important that the court system operate efficiently to rectify those mistakes, while protecting holders of valid patents. Today, the legal playing field is significantly tilted in favor of patentees.

Prof. Lerner and I have highlighted the role of juries in deciding patent validity questions as a crucial source of undesirable and unnecessary uncertainty in the litigation process. The evidence in a patent case can be highly technical, and the average juror has little competence to evaluate it. Having decisions made by people who can't really understand the evidence increases the uncertainty surrounding the outcome. The combination of this uncertainty with the legal presumption of validity—the rule that patents must be presumed legitimate unless proven otherwise—is a big reason why accused infringers often settle rather than fight even when they think they are right.

For accused infringers, the difficulties associated with the presumption of validity and the uncertainty of juries are compounded by the availability of remedies or penalties for infringement that are far out of proportion to the economic harm that a patent holder may have suffered as the result of infringement. While it is important that patent holders have the ability to uphold valid patents, remedies that are vastly disproportionate to the economic significance of the patent at issue do not serve any legitimate public policy purpose, and create the incentive and opportunity for those who would use the patent system for ransom and extortion rather than innovation.

Conclusion

The protection for true innovators created by a workable patent system is vital to technological change and economic growth. The problems in the existing U.S. patent system are structural, and the solutions need to be fundamental. As much as the USPTO and the Courts can and should address some of the weaknesses of the existing system, meaningful reform requires important modifications to the statutory framework. In these days of polarization and ideological divide in Washington, patent policy reform offers an unusual opportunity for real action in the public interest. As evidenced by the discussion in the FTC and STEP reports, being pro-reform does not make one anti-patent. On the contrary, the motivation for patent reform derives precisely from the recognition that a well-functioning patent system is absolutely crucial to our technological progress and economic health.

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