

Patent Demand – A Simple Path to Patent Reform¹

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The patent system in the United States was intended to help promote the useful arts by providing inventors of new technologies the time-limited right to exclude others from the market in exchange for disclosure of their inventions. Thus, it was thought, inventors would be fairly compensated for their contributions, and society would benefit by the early disclosure of inventions thereby encouraging more rapid evolution of technology. Recently, however, dissatisfaction with the product of the modern patent system has led to calls for massive legislative patent reform, significant patent decisions by the United States Supreme Court and efforts for systemic reform proposed by the United States Patent and Trademark Office (USPTO).

What problem could cause all three branches of government to assail the patent system with great potential to do real damage? In two words: Patent Quality, or, more precisely, the lack thereof. There exists a general dissatisfaction with the operation of the USPTO because of patents that it seems, should not have been granted. When a company is sued for patent infringement on a patent that was improvidently granted, even if it eventually wins, the benefit to the company of that win is that the company only spent several million dollars in defense costs. None of the current proposals and judicial interventions relating to the patent system addresses the true source of the problem.

In 2006, there were 419,760 patent applications filed in the USPTO. The current US patent system is in crisis as the result of the sheer volume of patent applications that large companies file both defensively and for offensive licensing purposes. The USPTO has been overwhelmed by the volume of patent applications, and it seems to vacillate between the policy of granting patents quickly without the necessary rigorous review, and the policy of creating as many obstacles to obtaining patents as possible (the current trend). The USPTO is not primarily responsible for the problems in the US patent system, but rather the volume of patent applications has created an environment wherein no human process can reliably decide whether any single patent application should be granted or denied. In other words, the USPTO has been given an impossible task with no rational and fair solution, except perhaps one.

In this article I propose raising the patent application filing fee for large corporate entities to \$50,000 and a modest reform to USPTO examination procedure that will lead to an expeditious and fair disposition of all patent applications. Let me emphasize, this proposal is only for large entities, not small companies or individual inventors. I will begin by reviewing patent application and fee data over time to view the problem. I will discuss how the USPTO has attempted to deal with the flood of patent applications. Next, I will estimate a demand curve for patent applications and discuss proposals for systemic change. Finally, I will discuss the impact of these proposals on the patent system. Some of the problems that I identify in this paper may be more prevalent in the high technology sector than in the chemical or manufacturing sectors, but, I believe that all sectors will benefit from an improved patent examination system.

Patent Application Dataⁱⁱ

Figure 1 contains a chart of patent application data from 1970 to 2006. The most striking feature of this data is that in that last 5 years, over 1.8 million patent applications were filed. It is little wonder that the USPTO reports nearly a one million case backlog. This number understates the true impediment to patenting that the USPTO has become because it includes only cases that have yet to get a first office action on the merits in the backlog. The total number of pending cases awaiting final disposition by the USPTO is unknown.

Year	Filings	Year	Filings
1970	100573	1989	151331
1971	104160	1990	163571
1972	103122	1991	167715
1973	101391	1992	172539
1974	103979	1993	174553
1975	101911	1994	186123
1976	102389	1995	221304
1977	102587	1996	191116
1978	101304	1997	220773
1979	100339	1998	240090
1980	105046	1999	261041
1981	107513	2000	293244
1982	116731	2001	326081
1983	97448	2002	333688
1984	109539	2003	333452
1985	116427	2004	355527
1986	121611	2005	384228
1987	126407	2006	419760
1988	137069		

Figure 1

Figure 2 provides a graphical view of the data from Figure 1 clearly showing a nearly logarithmic growth of patent applications filed since 1980. The USPTO is on a clear path to one half million patent applications being filed per year before 2010.

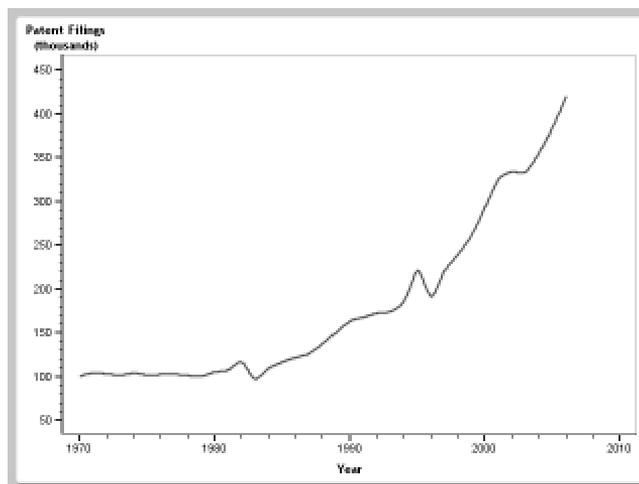


Figure 2

Response One by USPTO – Hire More Examiners

Recognizing that the growth in new patent applications was not going to slow down, the USPTO began hiring new examiners, first at a rate of 1000 per year, and now at a rate of 1200 per year. The Government Accountability Office (GAO) recently published a study where the title says it all: “Hiring Efforts Are Not Sufficient to Reduce the Patent Application Backlog.”ⁱⁱⁱ First, the report found that over the past 5 years, the USPTO has based its hiring upon its funding rather than on the backlog and expected workload. Second, 70% of patent examiner attrition was from examiners who have less than 5 years of experience. Finally, the report notes that 67% of examiners identified production goals as the primary reason that they consider leaving.

The report notes that “[e]ven with its increased hiring estimates of 1,200 patent examiners each year for the next 5 years, USPTO’s patent application backlog will continue to grow, and is expected to increase to over 1.3 million at the end of fiscal year 2011. According to USPTO estimates, even if the agency were able to hire 2,000 patent examiners per year in fiscal year 2007 and each of the next 5 years, the backlog would continue to increase by about 260,000 applications to 953,643 at the end of fiscal year 2011. *The agency has acknowledged that it cannot hire its way out of the backlog despite its recent increases in hiring, and is now focused on slowing the growth of the backlog instead of reducing it.*” (emphasis added) So, the best we can expect by 2011 is a backlog of 953,643 applications. I think that given the data in Figure 2, it will be difficult for the USPTO to attain that “small” of a backlog in 2011.

The revolving door in the patent examination corps is another interesting problem. On page 14 of the report, the GAO states that it takes 4-6 years of on-the-job experience to become proficient as an examiner and 70% of those who leave have 5 years of experience or less. It can not be a shock to anyone that USPTO examiners have a high attrition rate. Recent engineering graduates are simply putting in a few years at the USPTO before going on to law school and obtaining high-paying patent lawyer jobs. However, in its

survey of USPTO examiners, the GAO found that 67% of examiners believe that production goals are the primary reason they would consider leaving the USPTO. So there is opportunity for USPTO management here - examiners want more time to do their jobs and they will stay put.

Response Two by USPTO – Patents Damaged

Most people think that poor patent quality refers only to patents that are improvidently granted. For example, the patent examiner did not adequately search for the prior art, or failed to appreciate a reference that was before them, or did not apply a reference correctly, or was outgunned by the applicant's high-priced counsel. Improvidently granted patents are the more important type of poor patent quality, however, I believe that a second and important type of poor patent quality is patents that should be immediately granted, but are delayed or damaged by inappropriate office actions (I refer to this second type of poor patent quality as "Damaged Patents").

Damaged Patents are the product of the USPTO being overwhelmed by the nearly half-million patent applications it is tasked with reviewing each year. How does the USPTO deal with examining this number of applications? The office has two basic choices: (1) let everything through with minimal examination (characterized by the era when examiners were told it was their job to get patents for their "customers") or (2) let nothing through (it seems the office is currently in this mode). This second approach by the USPTO exacerbates an already huge backlog, damages patents by creating a much longer patent pendency and damages patents that should be issued through a first action allowance.

Let's assume that an inventor has created a new way to produce hydrogen from water by using a special RF energy generator to break down the molecular bonds of the water and a patent application is filed. First, of course, the application is not even substantively reviewed by an examiner for at least two years. Next the examiner, who has just graduated from college and the 8-month training course, misunderstands the invention, does a search for electrolysis and finds a huge amount of "prior art" to cite in the first office action (3 months later). The applicant requests an interview wherein the invention is made clear to the examiner, who signals that some dependent claims might be allowable. The applicant files an amendment to the main claims that includes the dependent limitation (3 months later). The examiner does a new search and identifies a reference on a simple RF generator and cites that reference plus the electrolysis reference as obvious and submits a Final Office Action (3 months later). The applicant files a Request for Continued Examination, pays the fee and argues over the reference. Then, the examiner issues the patent that is now a Damaged Patent by the inappropriate office actions and delay (6 months later).

The applicant finally has a Damaged Patent that should have been allowed by the USPTO on the first office action based on the first search that the examiner did. Of course, the applicant may file a continuation case to attempt to get the proper scope of claims, but that will delay the process for years to come. The USPTO has been forced into making one of two equally bad choices because of the volume of patent applications it faces. Again, the fault here is not entirely, nor even primarily the USPTO's, rather the fault is shared with Congress and large corporations filing thousands of patent applications with relatively minor incremental improvements because the fees for filing allow this abuse of the patent system.

Demand Curve Estimation

So, now that we have identified the problem of too many patent applications being filed, can we do an analysis that may lead to a solution? Figure 3 adds GDP data over time to the patent application data and patent filing fee data for large entities directly below.

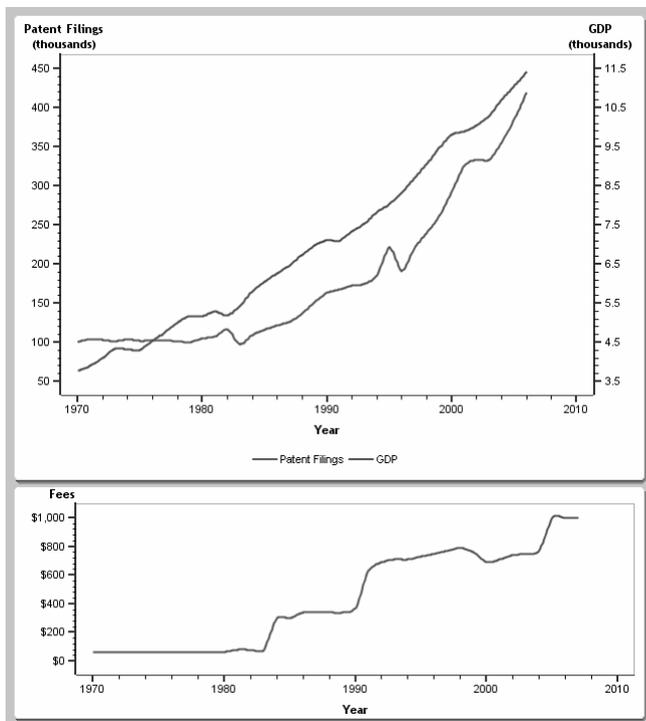


Figure 3

Two observations are visually apparent in the data: (1) when patent fees rise, patent applications fall, but then rise again and (2) GDP and patent applications appear to be highly correlated. So, is it possible that patent applications behave like any other good in commerce? In other words, can we estimate the demand for patent applications using filing fees and the quantity of patent applications filed each year?

In order to estimate a demand curve, we examined the patent application and fee data using SAS® software to create an ARIMAX model, and then performed a log/log transformation of the model to estimate a demand curve and obtain a measure of elasticity. The resulting demand curve provides that a one percent increase in filing fees would result in a .1% reduction in the number of patent applications filed. With this model, I can now estimate some points on the demand curve as follows:

\$1000	450,000 applications
\$1010 (1%)	449,500 applications
\$1100 (10%)	445,500 applications
\$2000 (100%)	405,000 applications

Figure 4 provides a graphical view of this estimated demand curve.

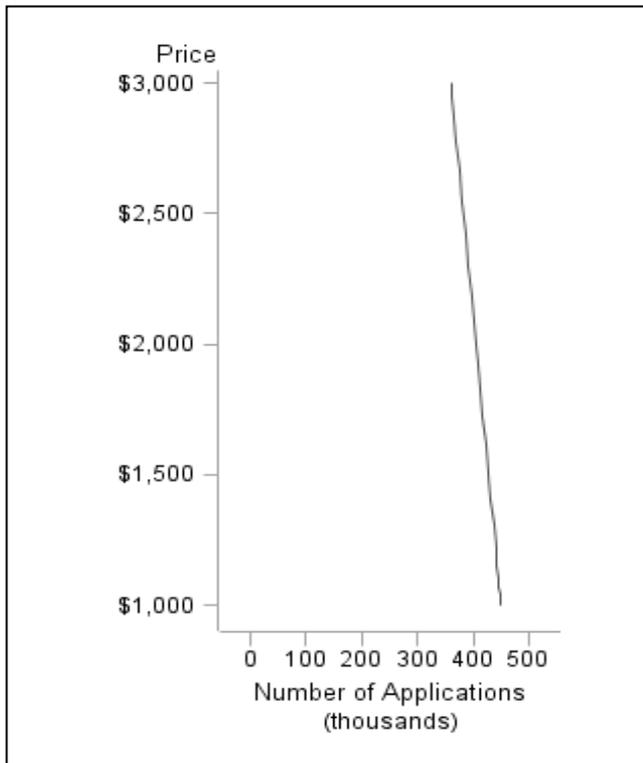


Figure 4

As can be seen, the demand curve for patent applications appears to be fairly inelastic (steep) at this point in the curve. An inelastic demand curve suggests that changes in price yield relatively small changes in the quantity of patent applications demanded. However, one should keep in mind that this point in the demand curve reflects a very low price for each patent application. In other words, we are currently viewing the extreme tail of the demand curve. Query whether the demand curve is more elastic at prices that are significantly higher?

To answer that question we must assume that budgets for patent counsel in large corporations will not significantly increase as a result of increases in patent application fees. This assumption seems reasonable given that budget constraints in large corporations do not allow for large increases from year to year. Figure 5 provides a theoretical view of what the demand for patent applications may look like at significantly higher patent application fees.

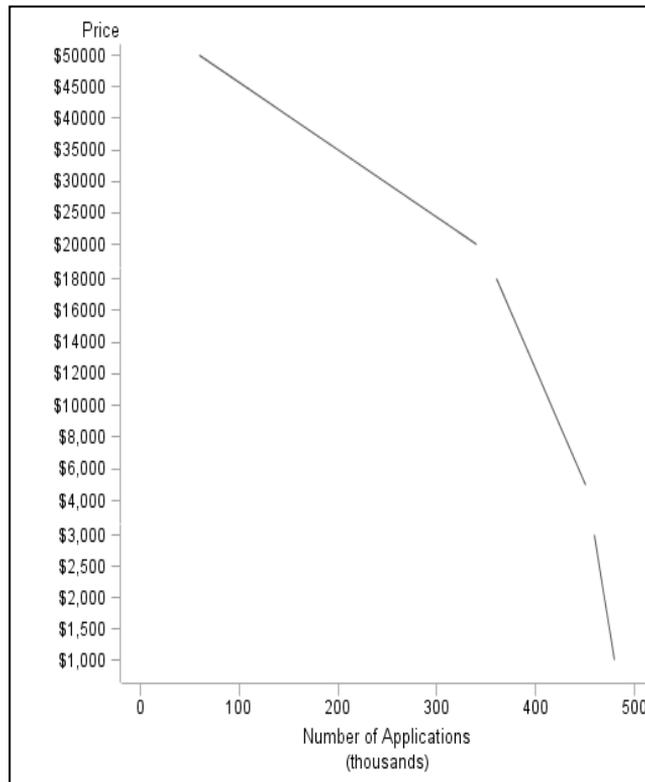


Figure 5

As you can see, there are now three demand curve sections: First, the original very inelastic curve between \$1,000 and \$3,000; second, a more elastic portion between \$5,000 and \$18,000 and third a very elastic portion from \$20,000 to \$50,000. Now, if the goal is to control the number of patent applications that the USPTO must examine, Congress need only select the corresponding filing fee for large entities. So, if Congress believes that the USPTO can adequately examine 300,000 patent applications per year, then it should select a large entity fee of \$25,000. If Congress believes that we should return to the number of patent applications filed in 1982, then the corresponding fee would be nearly \$50,000, or almost 50 times the current filing fee. What would the impact of such a policy be on the patent system?

Impact on Corporations – A Two Filter System

Typically, large corporations file patent applications in an attempt to limit their exposure to patent infringement claims and improve their position in patent licensing negotiations. In this arena, the company is looking to maximize the number of patent applications filed given current budget constraints, so that it enters any licensing negotiation with the largest stack of patents.

Now, recall the visual correlation between GDP and patent application filings from Figure 3. A mathematical examination of the actual number reveals a 0.98 correlation between GDP and patent application filings, after correction for autocorrelation in the patent application filing data. This means that 98% of the variability of the patent application filing data is explained by GDP alone, and only 2% of the variability is unexplained. So, the patent application filing decisions are almost entirely driven by the number of dollars available in corporate coffers, rather than whether the subject matter is truly patentable. In other words, the patentability of an idea disclosed in a patent application does not determine whether the case is filed, and the corporate filter on the patent application process does not currently exist.

If the large entity patent application fee is raised to \$50,000 the model proposed in this paper predicts that corporations will file significantly fewer patent applications. This means that innovations within that corporation will be competing for the dollars allocated in the budget for filing fees. During that competition, the experts in the field, the inventors, will be debating which innovations will become approved patent applications, and ultimately a decision must be made as to the “best” innovations. This competition will act as the most important filter in the patent process. The filed application then will pass to the less important filter at the USPTO. If a patent application is not worth a \$50,000 filing fee to a large entity, then it is simply not significant enough to be patentable.

Impact on the USPTO – Rethinking Patent Examination

As described above, the USPTO has reacted to the increased filing of patent applications by damaging many applications that get filed, and by proposing a package of rule changes that will substantially increase the burden of filing patent applications on all applicants. In my view, the USPTO is attempting to raise the price of the patent application process to reduce the number of patent applications that are being filed. These attempts by the USPTO to address the issue of patent quality issue may in fact lead to fewer patent applications being filed, but it will do so at the expense of damaging the patent system in general.

This leads me to a proposal on reforming the patent examination process. First, and most importantly, I would increase the filing fee for large entities from the current \$1,000 to \$50,000. That \$50,000 fee is the only fee that the USPTO may charge to the applicant for the examination of that patent application all the way through appeal to the Board of Patent Appeals. This will dramatically decrease the volume of patent applications that the USPTO must examine. Second, the examiner must interview the applicant and do a complete prior art search within six months of the USPTO receiving the application. The examiner then will review the prior art for either a complete anticipation of each claim by a single reference, or a simple obviousness case made by the combination of no more than two references against each claim. (As an aside, the patent system would benefit by

Congress providing a clear definition of the term obviousness, rather than allowing the USPTO and the courts to continue to struggle with their own interpretation.) If either is found, the examiner may issue an office action. This would also be the time to address any informality in the application. If the examiner does not have either an anticipation or a simple obviousness case, then they should simply issue the case. Remember, the application in question has already gone through the most important filter of competition within the corporation.

At a \$50,000 filing fee, my model estimates that the number of patent applications would fall to 150,000 per year. This would mean a \$7.5 billion budget for the USPTO each year, presuming that Congress continues the policy of no fee diversion. Certainly, with far fewer applications to examine and significantly more money to pay and equip examiners, the USPTO can retain excellent examiners who can provide excellent examination of the competition-improved patent applications. Also, the USPTO will be able to use the same excellent examiners to examine patents filed by small entities and individual inventors and provide a much improved examination to that group as well. The end result of this process will be rock solid patents that everyone can rely upon.

Impact on Patent Markets

As more traditional manufacturing jobs continue to leave the US, intellectual property has become a more important asset to many companies. Patents have often been referred to as the currency of the new economy where information is power. Why then, can't an inventor take a patent to the bank and get back a loan on favorable terms? The answer is banks don't have confidence in the value of any patent because it is significantly likely that the patent in question is worth nothing. If the proposals put forth in this paper are implemented, there will be far fewer, high-quality patents issued by the USPTO, and so the value of each individual patent will significantly increase.

Consider the difference between the average patent in the high technology sector and a pharmaceutical patent. First, the entire brand pharmaceutical industry depends upon obtaining strong patent protection. So when a pharmaceutical company makes a billion dollar decision to bring a new product to market, the company will spare no expense making sure its patent position is excellent. An average high technology patent contains a minor improvement on a small portion of a product and the patent application is typically written using outside counsel working for a flat fee of a few thousand dollars. Imagine what would happen to the high technology company's patent process if each patent application cost \$50,000 just to file. The high technology company would file far fewer, but more important patent applications and they would spend more time and effort doing so. The pharmaceutical company's process probably would not change much because a billion dollar decision depends on the outcome of the patent process.

What would happen to non-practicing entities, sometimes derisively referred to as patent trolls? I believe that these entities will change to patent market facilitators, or cease to exist. When the value of all patents is increased substantially, it is very unlikely that any patent will be available to fall to these non-practicing entities. First, each individual patent will be more valuable to the current owner of that patent, so it will be less likely that an owner would be willing to part with it to a troll. Second, if a company does fail, competitors of that company may be more willing to buy that patent rather than allow it to fall to a company that may sue the competitor. Finally, fewer issued patents mean that it will be easier for companies to monitor patents issuing in their product space and less likely that they will allow those patents to fall into the hands of a troll.

What would happen to patent litigation? I believe that there will be substantially less patent litigation if these reforms are implemented. First, better examination at the USPTO will yield patent claims that are simpler to interpret and understand. As an example, it is less likely that a claim will have a laundry list unpatentable elements recited prior to the one slight improvement on current technology. Easier claim interpretation will lead to fewer disputes of infringement and more settlement of claims. Second, better examination at the USPTO will yield to a higher confidence in the validity of the resulting patents and again, more settlement of claims. Finally, a greater confidence in the quality of issued patents by the judiciary may lead to a rolling back of recent decisions that have decreased the impact of infringement verdicts in patent cases.

What would happen to corporate intellectual property strategy? I think that even if these reforms are implemented, patent protection will remain the most important type of protection that a product can obtain. However, patent protection will be less frequent, so trade secret protection of more minor innovations may become more important to corporate intellectual property strategy. Trade secret protection will be used to protect minor innovations that give one product a competitive advantage over others. The typical commercial product will have major innovations protected by patents that are surrounded by minor innovations protected by trade secret.

Conclusion

The US patent system is in a crisis that has been caused by the flood of patent applications being filed at the USPTO every year. I have proposed a model that may be useful in controlling the number of patent applications filed in the US. However, I do not suggest that Congress raise patent application fees to \$50,000 in 2009. Perhaps the first fee increase could be to \$10,000, and then we can study the results to verify whether the application data have moved in the right direction. The model can then be recalibrated to take this new data into account and a larger or smaller next step can be identified. I believe that the patent system will be significantly improved by the preceding reforms, but it will surely be marginalized if we continue on the current path.

Tim Wilson is Senior IP Counsel in the Legal Division at SAS Institute Inc., the world's largest private software company, where he leads the patent practice. He also provides advice on all types of intellectual property law matters and competitive intelligence issues. Prior to joining SAS, Tim was an associate at Brown Raysman in New York, where he advised clients on all manner of licensing and outsourcing transactions. Tim began his legal career as a patent and intellectual property litigator with Jones Day in Cleveland. Tim received his JD from Syracuse University College of Law in 1992 and a BS from Pennsylvania State University in 1989. Tim is a member of the Editorial Board of *Patent World*.

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ⁱⁱ Much of the data reviewed in this paper comes from the excellent study, *Modeling and Forecasting U.S. Patent Application Filings*, by Adams K.; Kim D.; Joutz F.L.; Trost R.P.; Mastrogianis G., *Journal of Policy Modeling*, Volume 19, Number 5, October 1997, pp. 491-535(45). The author gratefully acknowledges the assistance of Gus Mastrogianis from the USPTO in updating the data as well.

ⁱⁱⁱ <http://www.gao.gov/new.items/d071102.pdf>