



# **Better Prior Art Utilization to Improve Patent Quality**

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## **Executive Summary**

The strength of technological innovation, the catalyst for American prominence, can be directly correlated to the strength of intellectual property this paper discusses. It is for this reason that the growing number and complexity of inventions deserve the most efficient and thorough patent examination that can be managed given finite resources and human capabilities. With the emergence of new fields with very little “patent” prior art, such as nanotechnology, the United States Patent and Trademark Office (USPTO) finds itself overwhelmed when trying to analyze the novelty of an invention. Changes must be made at the patent office to give examiners access to vast amounts of non-patented prior art as well as provide incentive for external prior art submission in the form of limited deference to only prior art actually considered by the USPTO.

### **Policy Recommendations:**

- Increase non-patent resources at the USPTO.
- Encourage applicant prior art searches by making available a two-tier system with a stringent examination process.
- Promote third party submissions with a pre-grant opposition system.
- Limit deference to examined prior art.

## **Preface**

### **About the Author**

Jonathan Becker is a rising senior at Syracuse University majoring in Electrical Engineering and expects to graduate in December 2008. Jonathan plans on attending law school and pursuing a career in patent law.

### **About WISE**

Founded in 1980 through the collaborative efforts of several professional engineering societies, the Washington Internships for Students of Engineering has become one of the premier Washington internship programs. Its goal is to groom future leaders of the engineering profession who are aware of and can contribute to the important intersections of technology and public policy.

### **Acknowledgements**

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# 1 Introduction

American innovators have always looked to patents as a means to protect ideas for economic gain. A patent reflects the development of new technologies, provides incentives for research, and publishes ideas to the technical community, which in turn catalyzes more innovation. According to a study by investment firm Ocean Tomo in 2005, “three decades ago, factories, equipment and inventory made up over 80% of the stock market's value. As the U.S. has evolved... those tangible assets account for only 20% of the S&P 500's value. The other 80% is in intellectual property, such as patents.”<sup>1</sup> With the growing importance of intellectual property, this paper will take a brief look at the possible impacts of patent quality on the economy before delving into methods of improvement.

Poor patent quality “has unsavory consequences on entrepreneurship, ranging from holdup licensing to patent thickets.”<sup>2</sup> Companies looking to contract, or license intellectual property, must allocate resources to investigate the validity of an issued patent that is of questionable quality. This allocation detracts from a company's ability to feasibly contract and sometimes eliminates the possibility altogether. In addition, leakage of a high number of low quality patents through the United States Patent and Trademark Office (USPTO) makes it profitable for patent trolls or entrepreneurs to acquire patents with broad claims, hoping that enforcement leads to a large payoff. This in turn causes industry to spend large sums of money in the courtroom, causing “reduced rates of innovation, decreased patent-based transactions, and higher prices for goods and services.”<sup>3</sup>

The Patent Reform Act of 2007, passed by the House and stalled in the Senate, is aimed at enacting many reforms including stemming increasingly expensive patent litigation. For example, one part of the act would limit the amount of damages courts will be able to award

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<sup>1</sup> Intellectual Capital Equity® Value see <http://www.oceantomo.com/ice.html> July 15, 2008

<sup>2</sup> John R. Thomas, “Patent Reform in the 110th Congress: Innovation Issues,” *CRS Report for Congress* May 7, 2007, <<http://www.judiciary.house.gov/media/pdfs/Thomas070426.pdf>> (13 July 2008).

<sup>3</sup> *Ibid.*

patent owners in successful suits.<sup>4</sup> Patents are too often much more valuable in the courtroom than as a market tool, but this would not be a problem if only the patents deserving litigation were involved. Reforming awarded damages does not effectively resolve the problem of litigating too many undeserving patents. These poor quality patents need to be weeded out during the examination stage, before there is a chance for litigation abuse. Increasing the number of examiners, the time examiners have to review patents, and the amount of prior art they have available to review will have lasting impacts in the courtroom and marketplace.<sup>5</sup> The USPTO is making an effort to hire and retain more examiners but quality and abundance of prior art still remains an issue.<sup>6</sup>

The USPTO's granting of poor patents arises from lack of knowledge of relevant prior art, which is the existing set of related inventions or public material. This has become an increasing problem especially in new technological fields like nanotechnology.<sup>7</sup> Examiners may very often be less informed than innovators about relevant prior art in nanotechnology and thus be at a severe disadvantage during examination.<sup>8</sup> To overcome this obstacle, as much pertinent prior art as possible using finite monetary and time resources needs to be available. This paper will analyze several areas of potential reform and their effects on the quality of issued patents and the system in general.

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<sup>4</sup> Patent Reform Act of 2007

<sup>5</sup> Eric Schonfeld, "Patent Reform Act Focus on Wrong Problem," January 14, 2008, <<http://www.techcrunch.com/2008/01/14/patent-reform-act-focuses-on-the-wrong-problem>>(2 July 2008)

<sup>6</sup> USPTO Strategic Plan 2007-2012 (DRAFT v6) [http://www1.uspto.gov/go/com/strat2007.bak/stratplan2007-2012\\_06.htm](http://www1.uspto.gov/go/com/strat2007.bak/stratplan2007-2012_06.htm)

<sup>7</sup> Sampat, B. "Examining Patent Examination: An Analysis of Examiner and Applicant Generated Prior Art," (2005).

<sup>8</sup> Lemley, M. "Rational Ignorance at the Patent Office," *Northwestern University Law Review*, 95:1—34 (2001).

## 2 Background

Before delving into reform issues and recommendations, this section provides a brief overview of the purpose of prior art and prior art's effect on patent quality. The reasons for patent quality reform will also be discussed.

### 2.1 Prior Art and Its Role in Examination

Any publication, in any form, which relates to the claims of a patent application qualifies as prior art. Often, patent examiners use earlier patents and scientific publications as they are abundant and easily accessible. Textbooks, newspapers, lectures and any other disclosure can also be used regardless of the language, the technical level, or the number of copies available as long as the document is publicly available before the date of file. A patent cannot claim something that already exists or that is obvious, which is described by the novelty<sup>9</sup> and non-obviousness<sup>10</sup> clauses of US patent law. To determine this, patent examination involves prior art searches and analysis to ensure that the invention is new and not obvious to a “person having ordinary skill in the art.”<sup>11</sup>

An important reason for the patent system's existence is to give a reward, in the form of a short monopoly of 20 years from date of file,<sup>12</sup> in return for disclosing the details of the invention to the public domain so that the information may be used to further innovation. To qualify for this reward, the invention must claim something that is not already available to the public. When this is not the case, meaning there exists relevant prior art to one or more of the claims of a patent, the patentee could receive a monopoly on information already known by the public.

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<sup>9</sup> 35 U.S.C. §102

<sup>10</sup> 35 U.S.C. §103

<sup>11</sup> *Ibid*

<sup>12</sup> 35 U.S.C. § 154(a)(2) (2006).

Consequently, the search for meaningful prior art and its comparison to the claims of a patent during examination are critical for the system to carry out its function.

Patent examination begins with a search for the available literature published before the application filing date that describes at least part of the claims of the invention. This search is known as finding "the state of the art."<sup>13</sup> In all cases, examination of the patent application is carried out on the basis of the claims.<sup>14</sup> A prior art document is analyzed to find whether it describes the claim in the same manner, making it relevant prior art. If an examiner finds that the claim has been described the same way in prior art, then the claim in the application loses its novelty. Each independent claim is examined separately and may be sent back to the applicant to readjust or narrow the claim and then reapply.

## **2.2 Impacts of Low Patent Quality**

Patent quality is difficult to define by a specific standardization. In general, the more narrow the claims of the patent at the time it is granted with respect to the time it was filed, the higher quality the patent is. This is because overly broad patents either make claims that are not substantiated or infringe upon previous patents or the public domain of information. Patents with narrow claims may be "reliably enforced in court, consistently expected to surmount validity challenges, and dependably employed as a technology transfer tool."<sup>15</sup> Quality patents define their claims with great clarity, making the patent value more obvious, as well as making it easier for other innovators to develop with less fear of infringement. This encourages research and development in complex areas of technology that are difficult to maneuver within when a high number of complex, convoluted, and broad patents exist. Companies are unlikely to want to risk

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<sup>13</sup> KSR International Co. v. Teleflex Inc., 127 S.Ct. 1727 (2007)

<sup>14</sup> "The [patent application] shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention." 35 U.S.C. § 112 (2000)

<sup>15</sup> Institutions for Intellectual Property Transactions: The Case of Patent Pools, Robert P. Merges (1999)

a venture in fields like this because broad patents require extensive resources to analyze and find the limits of their claims. Furthermore, there is no guarantee a court would define the limits the same way should an infringement suit arise.

Bad patents can have a serious economic downside as outlined by a preliminary study by the Phoenix Center estimating a loss of \$22.5 billion per year due to bad patents.<sup>16</sup> Although this is a preliminary study, it provides good insight into the negative impact of bad patents on the economy and the need for improvement. The paper investigated and found several reasons as to why low quality of patents have a detrimental effect on the United States economy. Since companies must pay licensing fees for their inventions that infringe on a patent, at least some of that cost is passed onto the consumer.<sup>17</sup> When an inventor is granted a patent or monopoly on information that was already in the public domain, consumers are forced to pay extra for free information. It is not hard to see how this is a quick recipe for reduced sales and reduced revenue for companies, which must then direct resources away from productive research. To stay competitive, technology companies direct resources toward “acquiring and enforcing substandard patents and collecting royalties rather than other more-productive fields of economic activity.”<sup>18</sup> The Phoenix Center did not even incorporate into their research the vast amount of resources expended in patent litigation on patents that should not have been granted.

### **3 Issues Concerning Patent Quality Reform**

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<sup>16</sup> Phoenix Center for Advanced Legal and Economic Public Policy Studies, George S. Ford, Thomas M.Koutsky and Lawrence J. Spiwak (2007).

<sup>17</sup> *Ibid.*

<sup>18</sup> *Ibid.*

Discussed in this section are the various problems and issues associated with patent quality. The section focuses on the constraints on the USPTO and the circumstances surrounding external submissions.

### 3.1 Problems Facing Patent Quality

The patent system is failing at improving the quality of patents. The USPTO is fighting a losing battle because steadily increasing patent filings (see Figure 1) which reached more than 400,000 applications in 2008, outstrip the agency's resources.<sup>19</sup>

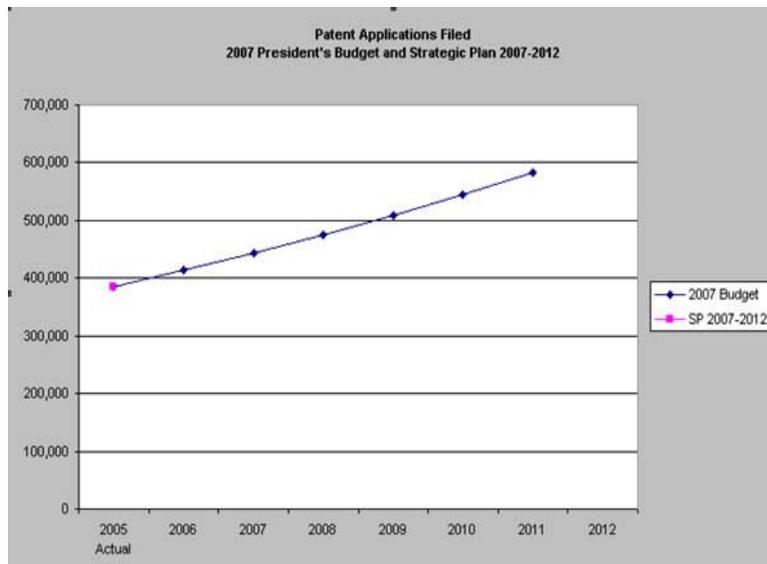


Fig. 1 Patent Applications Filed: Past Numbers and Future Projections 2007 President's Budget and Strategic Plan 2007-2012<sup>20</sup>

<sup>19</sup> USPTO Strategic Plan 2007-2012 (DRAFT v6) see [http://www1.uspto.gov/go/com/strat2007.bak/stratplan2007-2012\\_06.htm](http://www1.uspto.gov/go/com/strat2007.bak/stratplan2007-2012_06.htm)

<sup>20</sup> *Ibid.*

The constraints imposed by the complexity of the examination process as well as the time and monetary requirements of thorough examinations have prevented the USPTO from achieving adequate patent examination quality. The process of examining such a high volume of patents, coupled with the large number of claims per patent, has become increasingly difficult. Patent attorney Peter L. Giunta reported an average of 3.09 independent claims and 18.15 total claims per patent issued in 2003.<sup>21</sup> His study portrays a rising trend in the number of claims per patent application, which correlates with an increasingly complex technological world. Some patents contain considerably more claims than the average patent; these are usually the patents that have more value for a corporation.<sup>22</sup> For example, in the well-known patent litigation involving the BlackBerry® communications device,<sup>23</sup> NTP Inc., the infringer, claimed five infringed patents which incorporated 89, 276, 223, 341, and 665 claims respectively.<sup>24</sup>

The high demand for examination under the system of continuation applications and readjusted claims exceeds the current abilities of the USPTO to examine applications as they are filed, resulting in an increasing backlog of unexamined applications (Fig. 2). Continuation applications allow inventors to extend the period of examination at the USPTO in order to negotiate further with a patent examiner, amend claims, submit new claims, and gain additional time to prepare evidence to be submitted to the USPTO in support of their applications, among other potential benefits.<sup>25</sup> While continuations are an important part of the examination process, readjusted claims and the rising number of filed applications make it very unlikely the USPTO will be able to reduce the backlog of patents and increase patent quality without serious reform. According to Figure 2, patents with large claimsets take longer for the USPTO to examine, due to the large amount of prior art that must be searched through by the examiner to inspect each claim. The

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<sup>21</sup> Peter L. Giunta, "Quid Pro Whoa!: An Exponential Fee Structure for Patent Applications," 25 *Cardozo Law Review* (2004), 2317.

<sup>22</sup> John R. Allison et al., "Valuable Patents," 92 *Georgetown Law Journal* (2004), 435

<sup>23</sup> *NTP, Inc. v. Research in Motion, Ltd.*, 418 F.3d 1281 (Fed. Cir. 2005).

<sup>24</sup> The five patents asserted in the *NTP v. RIM* litigation were U.S. Patent Nos. 5,436,960; 5,625,670; 5,819,172; 6,067,451; and 6,317,592.

<sup>25</sup> Gary C. Ganzi, "Patent Continuation Practice and Public Notice: Can They Coexist?," 89 *Journal of the Patent and Trademark Office Society* 545, 574-80 (July 2007).

median number of citations per patent in the data used in Figure 2 was 13-14,<sup>26</sup> which reflects that the complexity of these patents prevents a quality examination involving sufficient prior art for each claim.

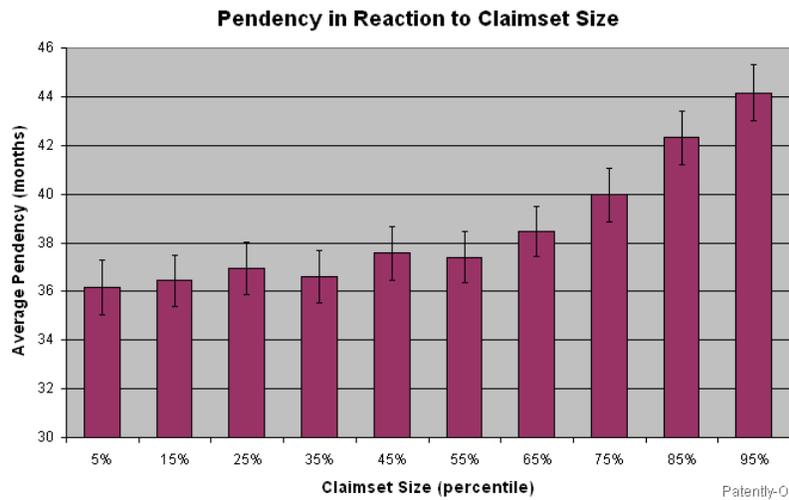


Fig. 2 Application processing time with respect to number of claims with for 10,000 patents from Jan-Feb 2007.<sup>27</sup>

The USPTO has undertaken numerous efforts to address these issues “by expanding the data considered in this process, refining its assessment processes including introducing an in-process review component to the quality data, and employing quality review results to guide the development of examiner training programs.”<sup>28</sup> These efforts have not been effective in increasing patent quality or society's confidence in the ability of the current process to do so.<sup>29</sup>

The patent citations of non-patent academic literature is astoundingly low, as reflected by the low number of citations of published material of major academic societies (See Table 3). As of

<sup>26</sup> *Ibid* 25.

<sup>27</sup> Dennis Crouch, *Prosecution Data*, Patently-O (February 15, 2007), <http://www.patentlyo.com>.

<sup>28</sup> *Ibid* 19.

<sup>29</sup> *Ibid*.

July 2008, only about 200,000 out of 4,000,000 issued patents since 1975 listed in the USPTO database cite at least one non-patent prior art item from the IEEE.<sup>30</sup> That means only about 5 percent of patents cite prior art from the IEEE. At least 1,000,000 electronics patents currently in the PTO database have been granted with the statement that nothing the IEEE has published is relevant to the invention. It is not acceptable for the largest engineering society to be cited so rarely when they have such major contributions to the technical community.

Society	IEEE <sup>31</sup>	SPIE <sup>32</sup>	ACM <sup>33</sup>	LNCS <sup>34</sup>
Number of Cited Patents	203652	28176	27851	1015

Table 1: Patent Citation Data regarding 4 major scientific societies<sup>35</sup>

At the same time, virtually no incentive exists for private industry to want or help patent quality improvements. Currently, all granted patents carry a presumption of validity, meaning that during litigation the patent is assumed valid and the duty falls to the infringer to prove the patent's claims are too broad or invalid. The difficulty for the infringer to prove themselves innocent is that they must provide “clear and convincing” evidence, a very high evidential standard, that the patent's claims infringe upon the relevant prior art. This deference to the USPTO is with respect to all prior art, whether examined or not by the examiner, which effectively gives bad patents equal footing with good patents. Searching through prior art would

<sup>30</sup> USPTO Database see <http://patft.uspto.gov/netahtml/PTO/search-adv.htm> This is just a rough estimate, as the search query only returns patents citing the journal and patents could cite papers from academic societies without listing the society. This is still a reasonable estimate and is appalling.

<sup>31</sup> The Institute of Electrical and Electronics Engineers.

<sup>32</sup> SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

<sup>33</sup> ACM, Association for Computing Machinery, the world's largest educational and scientific computing society.

<sup>34</sup> Lecture Notes in Computer Science.

<sup>35</sup> *Ibid* 30.

actually hurt the applicant because not only would it cost money, but it would also force applicants to submit any relevant prior art they find according to the “duty of candor” rule.<sup>36</sup> In the current state of the patent system it is not in the applicants' best interest to allocate more resources during the application process. Doing so may narrow a claim or nullify the application altogether. Consequently, meaningful reform must focus on making prior art examination citations an asset as opposed to an obstacle.

### **3.2 The Disincentives for Current Applicant Submissions**

The final prior art documentation included in the granted patent is ultimately the responsibility of the examiner although there is reliance on the applicant for prior art submission in the form of the Information Disclosure Statements (IDS).<sup>37</sup> Applicants have a “duty of candor” to submit prior art that they have knowledge of and has “a substantial likelihood that a reasonable examiner would consider it important in deciding whether to allow the application to issue as a patent.”<sup>38</sup> Failing to do so allows the use of an “inequitable conduct” defense in court, which if proven will conclude with the patent’s nullification. Thus, fear of inequitable conduct is often a disincentive for applicants to search for prior art. They would rather have the examiner do a search and if the patent is granted, their claims receive deference under the presumption of validity discussed in the previous section, and they do not have to worry about inequitable conduct. Prior art searches are expensive and most applicants who do a cost-benefit analysis will find doing a search is not economically strategic. In fact, many applicants strategically hope for a poor examination process to receive a broader scope of claims than is actually justified, for use in litigation at a later date. The doctrine of willful infringement discourages companies from

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<sup>36</sup> 37 CFR 1.56 This rule, created by the US Patent and Trademark Office, specifically requires that everyone involved with a patent application must disclose all publications that they know of which may adversely affect the patentability of their invention.

<sup>37</sup> 37 CFR 1.97 see [http://www.uspto.gov/ebc/portal/efs/US\\_IDS\\_Form\\_\\_SB\\_08a.pdf](http://www.uspto.gov/ebc/portal/efs/US_IDS_Form__SB_08a.pdf)

<sup>38</sup> USPTO 1998, Section 2242.

learning about their competitors' patents lest they be forced to pay treble damages in a future infringement suit, even though the standard of “duty of due care” has been raised to “objective recklessness.”<sup>39</sup>

### 3.3 Peer to Patent Program

A serious limitation on the extent and quality of PTO review is the lack of competition involved in the examination process. Competitors have the incentive and the knowledge to offer quality prior art but the current system is not built for it. Applications are not published until after eighteen months<sup>40</sup> in order to protect the application's contents in case the application is rejected and the applicant wishes to pursue trade secrecy in lieu of a patent. Thus, only the examiner and the applicants and their attorneys are involved in the beginning of the review process when prior art is introduced. As already discussed, this is certainly not a strategic combination for quality patent examination.

Pre-grant prior art submissions by third parties have been recognized, by both the USPTO and people in the intellectual property community, as a major contributor to the examination process. This is mostly thanks to the successful implementation of a voluntary, selective pilot program known as Peer to Patent, which just concluded its first year on June 15<sup>th</sup> 2008.<sup>41</sup> Peer-to-patent has the backing of USPTO who, on July 16<sup>th</sup> 2008, announced the extension of the project to July 15<sup>th</sup> 2009.<sup>42</sup> The pilot allows anyone to submit prior art to those applications that have been admitted into the program for a four month window from the date of publication.<sup>43</sup> Project Manager Chris Wong said this program is aimed at fixing the fundamental problem discussed in

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<sup>39</sup> *In Re Seagate* raised the standard for willful infringement, which used to be “duty of due care” but is now “objective recklessness,” which is a higher standard meant to stem the excessive litigation damages.

<sup>40</sup> This is actually a recent USPTO development as of 1999, whereas before applications were not published at all.

<sup>41</sup> New York Law School Peer to Patent Project See <http://www.peertopatent.org/>

<sup>42</sup> *Ibid.*

<sup>43</sup> *Ibid.*

this paper: “The most important thing is the information deficit... the serious possibility that they [patent examiners] are missing many pieces of prior art that are relevant.”<sup>44</sup>

The goal of Peer to Patent is to demonstrate to the USPTO the value of public participation in the patent examination process and produce support for opening up examination to greater input. Applications chosen for the pilot were from the more controversial fields in terms of patent quality such as Computer Architecture, Software, and Information Security. Results from the First Anniversary Report demonstrate public participation subjects an application through a stronger examination (greater number of references cited per patent examined, and more non-patent references), which would in turn make a stronger patent.<sup>45</sup> Peer to Patent is not attempting to replace the existing system but prove that third-party submissions improve patent quality. The results of the entire pilot should encourage the USPTO and the public to engage in third-party submission programs to improve patent quality. The goal of the pilot is to allow experts in the community to locate prior art which would otherwise be unavailable to the patent examiner. The program encourages participation from the scientific and technical community, such as IEEE, which is crucial to get non-patent prior art in front of examiners, especially in the emerging fields. Based on results from the First Anniversary Report, public participation improves quality on a significant number of patents. Although it is unlikely that all applications will receive equal attention when they are included, the patents in the more controversial and convoluted fields should continue to receive input. This is most important because these patents are the ones that are most likely to be litigated or provide obstruction to innovation, which is where reform is needed most. This pilot and its results provide a good platform to build a pre-grant opposition system like what is described later (see section 4.3).

## **4 USPTO Patent Examination Recommendations**

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<sup>44</sup> Chris Wong Interview with Out-Law radio produced and presented by Matthew Magee for international law firm Pinsent Masons, see <http://www.out-law.com/page-8486>.

<sup>45</sup> *Ibid* 41.

The recommendations included in the section serve to address the problems described earlier in this paper which have contributed to low patent quality. The emphasis of the recommendations are on the incentives Congress and the USPTO need to provide for external prior art submissions as well as the need for the USPTO to budget money for expanding their internal prior art resources.

#### **4.1 Restructure In-house Prior Art Resources**

Patent examiners conduct their own prior art searches, using entire text or reference databases of patent documents and academic literature.<sup>46</sup> The data accessible to these examiners and the time they have to analyze it are finite, and thus it is guaranteed that not all relevant prior art will be analyzed for every patent. Not only are these resources finite, but they are becoming more strained with the increasing number of filed patents and newly emerging fields.<sup>47</sup> Emerging fields have very little patent prior art posing a problem for examiners who rely on information that is “readily accessible, conveniently classified, and printed in a common format.”<sup>48</sup> In addition, the USPTO may not have access to the relevant non-patent databases in some new fields,<sup>49</sup> such as biotech or nanotechnology. Also, patent examiners may not have the skills to conduct the searches that quality patents in these fields would demand.<sup>50</sup> As shown in Table 2, the citation data correlates to a high difficulty of searching non-patent prior art to analyze. US patents make up a very large majority, causing major problems when dealing with the fields with very little patent history.

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<sup>46</sup> I. Cockburn, S. Kortum, and S. Stern. Are all patent examiners equal? The impact of examiner characteristics. NBER Working Paper w8980, 2002.

<sup>47</sup> Stephen A. Merrill, Richard C. Levin, and Mark B. Myers, A Patent System For the 21<sup>st</sup> Century, National Research Council 2004.

<sup>48</sup> *Ibid.*

<sup>49</sup> Greg Aharonian, patent attorney and editor of website bustpatents.com.

<sup>50</sup> *Ibid* 47.

	Share of Citations Inserted By Examiner	Share Inserted By Examiners, Average Across Patents
US Patents	41%	62%
Non-Patent Literature	10%	17%
Foreign Patents	12%	21%

Table 2: Citations inserted into patents by Examiners by Prior Art Type<sup>51</sup>  
*Data based on 502,687 Patents Issued from 1/1/01 to 12/31/03, and the 9,361,977 references in these patents*

The growth in nanotechnology, inventions smaller than 100 nanometers, provides a good example of the need to improve the USPTO infrastructure. The USPTO lacks a modern art classification to deal with the expansive claims indicative of nanotechnology and access to the robust databases of private industry.<sup>52</sup> Nanotechnology patents “span 200 primary U.S. patent classes and were examined by 794 unique primary patent examiners, approximately one-fourth of the primary patent examiners employed by the USPTO over this period.”<sup>53</sup> Almost 30 percent of the references in nanotechnology patents are to non-patent prior art, approximately 10 percentage points greater than that of other patents.<sup>54</sup> The USPTO is not suited to deal with fields that require this sort of expansive, widespread search for non-patent prior art with the limited resources and time available.

Thus, in order to deal with the extreme complexity, widespread claims, and lack of patent art, the USPTO must do in-house restructuring to develop a new art classification specifically for the emerging fields. Experts with extensive knowledge in the fields should be brought into the USPTO to act as consultants regarding examination strategy and classification.

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<sup>51</sup> Examining Patent Examination: An Analysis of Examiner and Applicant Generated Prior Art, Bhaven N. Sampat (2005).

<sup>52</sup> *Ibid.*

<sup>53</sup> *Ibid.*

<sup>54</sup> *Ibid.*

In addition, the USPTO must continue to fund digitization of library documents to make room in their undersized facility for the huge expanse of non-patent prior art required to do quality searches.<sup>55</sup> Data indicated in the next section outline the much better ability of applicants to identify non-patent prior art, which is also another key for the USPTO to produce quality patents under the constraints they face.

## **4.2 Establish a Two-Tier Patent Examination System**

Section 282 of the US Patent Statutes defines the principal of the presumption of validity which states “A patent shall be presumed valid. Each claim of a patent shall be presumed valid independently of the validity of other claims. The burden of establishing invalidity of a patent or any claim thereof shall rest on the party asserting such invalidity.”<sup>56</sup> The burden on the defendant of establishing invalidity correlates to a default decision of patent validity, meaning if the defendant cannot prove invalidity with clear and convincing evidence, the patent is valid. This deference is not just to the prior art the examiner was able to review, but all prior art related to the patent whether the examiner reviewed it or not. This high standard of proof forces the court to give deference to the USPTO, which would be warranted had the USPTO been able to grant a quality patent with a large amount of prior art and time to analyze it. This paper discusses the many reasons why the USPTO cannot do this, yet courts continue to assume that they can. Although there are some ironclad patents that have gone through a rigorous examination using large amounts of prior art deserve this deference, a vast majority of them do not.

Changing the defendant’s burden of proof from “clear and convincing” to a “preponderance of evidence” to acknowledge this weakness in the USPTO would encourage applicants to strengthen their application’s examination.<sup>57</sup> Weakening patent strength to match general patent

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<sup>55</sup> Patent Attorney Greg Aharonian has stated that the facility the USPTO have moved to is too small to expand their resources on site to the size they need to be on his website [bustpatents.com](http://bustpatents.com).

<sup>56</sup> 35 USC §282

<sup>57</sup> Recommendation made by Lee Hollaar IEEE-USA Intellectual Property Committee Member

quality should provide incentive for applicants to improve their patent's quality so as to improve its strength. In order for this to happen, a system of higher quality patent examination should be made available, but not required, for applicants who wish to make a "gold-plated patent."<sup>58</sup> In this system, normal application filing is still available, but if ever brought to litigation, is not afforded a high degree of deference as defined by a "preponderance of evidence" standard. This would give a realistic representation of the patent examination process in the courtroom and before a jury.

The system described is recommended in Mark A. Lemley and Doug Lichtman's paper Rethinking Patent Law's Presumption of Validity, in which they describe a "two-tier system" where the first tier is as described above. The second is that in which the applicant can afford more resources to gain a stronger patent, in what they describe as a "gold-plated patent."<sup>59</sup> A patent receiving this examination would be granted deference on all prior art reviewed by the examiner, which would be much more extensive due to the more rigorous examination procedure. In this scenario, there would now be an incentive for applicants to search out and submit as much relevant prior art as possible to strengthen their patent. Since this type of review would be more expensive than a standard review, only applicants with a strong application or meaningful idea would apply. Those simply relying on weak claims would opt for the cheaper route and receive limited deference if they attempt to litigate their patent, thereby making it more difficult to prove infringement. By implementing such a system, weaker and broader patents would be granted proportionally weak defenses during litigation while the more stringently reviewed patents would earn the strong defense it deserves. Thus, a system such as this would also have the benefit of providing a disincentive for excessive litigation, which is one of the key issues in the Patent Reform Act of 2007.<sup>60</sup> Congress should change the standard of proof from "clear and convincing" to a "preponderance of evidence" for patents granted through the standard examination process. In addition, Congress must give the USPTO rulemaking authority

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<sup>58</sup> Mark A. Lemley and Doug Lichtman, *Rethinking Patent Law's Presumption of Validity*, (2007).

<sup>59</sup> *Ibid* 58.

<sup>60</sup> See Patent Reform Act of 2007

to establish a more stringent examination process as described above to earn the court's higher degree of deference should litigation arise.

### **4.3 Create A Pre-grant Opposition System**

Congress must develop a system in which competition has an incentive to bring prior art before the examiner and argue their case, with certain limitations and stipulations, in order to greatly limit the number of broad and unwarranted patents. The pre-grant system should be composed of two windows in which third parties may take part in the examination process. During the first window, which would last for the first 90 days from the date of submission, third parties would be allowed submit prior art having to do with the specifications of the claims. Note that with the revised presumption of validity, it is now in the best interest of those who wish to be awarded the higher degree of deference to put their patent claims up against as much prior art as possible. At this point, participation will be limited to the submission of the prior art with a short document describing the claims it nullifies. In order to stem strategic blocking, the time period for submission is kept short and after two prior art submissions the third party should face a disincentive fee, which would be refunded if it is found the prior art is relative to a claim during the examination.

This window would be much like the peer to patent pilot where competitors may get information to the examiner before a decision is made. If the USPTO decides to grant the patent, it announces its decision, and there is a second window of 45 days for competitors to request a pre-grant re-examination before the patent is granted. During this examination parties may bring up relevant prior art and argue their case against the patent grant before a different group of examiners. In order to discourage abuse and waste of resources, the losing party should incur the cost of the proceeding in addition to both sides' legal fees. This should make the re-examination a route that is only taken in the cases where third parties recognize that patent is of obvious low quality and would more than likely cause problems for their own research and development if

granted. This is preferable to a post-grant opposition system where it is more likely that competitors will simply resort to litigation than use a re-examination system.

## **5 Impacts of Recommendations**

The effects of the proposed statute reforms, programs, and restructuring are discussed in this section. In addition to the value these reforms have for patent quality, other consequences will be considered.

### **5.1 The Value of More Prior Art at the USPTO**

The effect of the USPTO budgeting more resources to amass more prior art resources, especially non-patent prior art resources, has a clearly visible impact. One examiner writing anonymously to Bustpatents.com writes “the pressure on the examiners is unbelievable for more production and less time per case. It was very difficult to wait for 1 or 2 weeks to obtain a rare journal by inter-library loan. I wish the patent office would...realize that hiring new patent examiners is not the answer, but instead allowing the present examiners to better utilize the resources available.”

<sup>61</sup> The previous statement directly correlates to data previously presented (see section 3.1) that describes the low number of non-patent citations from major academic societies. With the serious time constraints and examiners need resources to be readily available within the USPTO facility. This reform should have a growing impact as the number of available resources increases, which will be identified with a much larger percentage of non-patent prior citations compared with the data shown in figure 2 (see section 4.1). Development of an art classification system to manage expansive claims from emerging fields will result in examiners being more equipped to reference the non-patent prior art that is available. These reforms will culminate in examiners being able to more correctly identify the “state of the art” and thus grant patents that more accurately represent claims that are actually novel.

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<sup>61</sup> Searching /working laments from ex-PTO examiners and lawyers Jan 22, 1997 see <http://www.bustpatents.com>

## 5.2 The Benefits of Applicant Submissions

With all of the difficulties discussed regarding application examination, it is no surprise that the PTO grants a large number of low quality and broad patents. If the examination process were to incorporate more effort on behalf of the applicants in the search for prior art, especially non-patent prior art, the ability of examiner to properly determine the scope of a patent would increase. Non-patent citations only make up about one fifth of prior art references (Table 3). Applicants submitted all of the non-patent prior art cited in about 70 percent of patents citing non-patent prior art.<sup>62</sup> These statistics represent the superior ability of applicants to identify relevant non-patent prior art, which the PTO can harness to a greater extent with proper incentives.

	<b>Share of All Citations in Patents, at Citation Level</b>	<b>Mean Number of References, At Patent Level</b>
US Patents	67%	12.58
Non-Patent Literature	18%	3.29
Foreign Patents	15%	2.75

Table 3: Prior Art References in patents from 2001-2003

*Data based on 502,687 Patents Issued from 1/1/01 to 12/31/03, and the 9,361,977 references in these patents<sup>63</sup>*

In comparison to other means of inducing applicant submissions, including coupling the duty of candor with a more stringent requirement for applicants to search through the prior art already in their possession, requiring relevance statements for prior art submitted, or greater use of Rule 105 which grants examiners the ability to ask the applicant for information regarding their invention,<sup>64</sup> this method actually provides a reward for extra cost and time. While these changes will improve patent quality, there are means to provide incentives for applicants to submit more

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<sup>62</sup> *Ibid* 51.

<sup>63</sup> *Ibid* 51.

<sup>64</sup> *Ibid*.

prior art on their own without enacting a series of policy changes that will burden applicants. Applicants are likely do a better job if they have something to gain in return for being burdened by more cost and paperwork.

### **5.3 Involving Competitors in the Examination Process**

A competitor in the applicant's field has incentive to submit prior art against patents that may be too broad or infringe on their patents early on, so as to save themselves from participation in expensive litigation later on. Any system that introduces pre-grant competition would of course have the potential for abuse, which is mitigated by the limitations imposed by the system described in the earlier section (see section 4.3). The pre-grant system of competition should be voluntary prior to the required date of publication, so as to still protect the right of an applicant to pursue trade secrecy if rejected. However, those who wish to gain a strong patent with the high degree of deference discussed earlier would take part in these systems to take some of the responsibility of submitting prior art off of their shoulders. The early publication this would require would not only improve patent quality, but would help innovation in general by releasing valuable information to the scientific community. This sort of system would be particularly useful in the emerging technologies such as nanotechnology and biotechnology, where prior art search would be more time consuming and costly.

## **6 Conclusions**

The current patent system in the United States needs to evolve to meet the changing demands of the technical sector. Many years ago, when applications were made up of primarily tangible inventions that had visible roots amidst a wide array of patentable prior art, the current USPTO system of patent examination was much more warranted. Innovation has, and will continue to, increase exponentially and the UPSTO must change as well if the patent is to retain its usefulness. It must be accepted that the PTO cannot and will not meet the demands of industry

under the resource and time constraints it faces without serious reform and restructuring. Money and increased resources will be valuable tools for examiners in the future, but ultimately, incentive for industry and public contributions are crucial to the process.