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Patents: Hiding from History

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Patents: Hiding from History

The Democratization of Invention: Patents and Copyrights in American Economic Development, 1790-1920, by B. Zorina Khan

Essay by Stephen M. McJohn*

Patent records can be a rich resource for researchers of all stripes. Economists have long used patent records in studying the relationship between technology and economic development. As The Cambridge Economic History of Modern Britain put it, “One of the few available quantitative output indicators for technology” is the records of the patent office.¹ Patents also provide a source of information for history of technology itself, as well as a useful source of technical information. Thomas P. Jones, an influential figure in early United States patent practice, “envisioned the Patent Office as a great repository of technical wisdom. He saw it, on one hand as a museum in which the mechanic could trace the historical progress of the art and, on the other hand, as a collection which described the present state of the art.”² Patent records have been used to rethink the role of marginalized groups, as in Mothers and Daughters of Invention: Notes

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for a Revised History of Technology\textsuperscript{3} and \textit{A Hammer in Their Hands: A Documentary History of Technology and the African-American Experiences}.\textsuperscript{4} Patent records have facilitated more specialized histories, such as \textit{Cotton: Origin, History, Technology and Production}\textsuperscript{5} or \textit{Glass: The Miracle Maker: The Miracle Maker, Its History, Technology And Applications}.\textsuperscript{6} Often the only remaining documentary evidence of an invention is its patent record.\textsuperscript{7} Patents have played a role in forensic research. Art conservation scientists used patents on paints and pigments to conclude that certain paintings attributed to Jackson Pollock were actually painted after his death.\textsuperscript{8} Patents even play a role in biographical research. The patents of Abraham Lincoln ("A Device for Buoying Vessels Over Shoals")\textsuperscript{9} and Albert Einstein ("Refrigerator")\textsuperscript{10} show less known sides of their personalities.

\textsuperscript{3} Autumn Stanley, Mothers and Daughters of Invention: Notes for a Revised History of Technology (Rutgers U. Press 1995).


\textsuperscript{5} C. Wayne Smith, Joe Tom Cothren, \textit{Cotton: Origin, History, Technology and Production}, 78 (Wiley 1999)(discussing market competition sparked by patented cotton gin “which used spikes attached to a cylinder rather than the saws used in modern gins.”).


\textsuperscript{7} See, e.g., Robert S. Woodbury, History of the Gear-cutting Machine: A Historical Study in Geometry and Machines, 106 Technology Press, Massachusetts Institute of Technology 1958) (“Another hobbing machine of which we have only the patent was that of Henry Belfield . . .... See his Patent No. 120023 of Oct. 17, 1871”). See also Jo Carrillo, Protecting A Piece Of American Folklore: The Example Of The Gusset, 4 J. Intell. Prop. L. 203, 232 n. 138 (1997) (“As there is no patent number or mark on the single remaining ‘Ladies' Hiking Tog’ garment that survives in the Levi Strauss & Co. Archives, the garment itself confirms Levi historian McDonough’s statement that it was not constructed under a patent. But note that this type of gusset, which is distinct from the public domain gusset, was eventually patented. See U.S. Patent No. 4,392,259; U.S. Patent No. 3,745,589, “Triangular Crotches for Trousers,” issued to Ebbe Bruno Borsing, (Jul. 17, 1973); U.S. Patent No. 478,190”) (cross citations omitted).


\textsuperscript{9} United States Patent No. 6,469 (May 22, 1849).

But the utility of the records is limited to the information disclosed. The first part of this essay looks at a recent book that relied heavily on patent records and copyright registrations to reexamine acutely the role of intellectual property in economic development, *The Democratization of Invention: Patents and Copyrights in American Economic Development, 1790-1920* (“Democratization”), by B. Zorina Khan. The essay’s second part discusses how patent law today discourages an inventor from accurately disclosing her invention and its place in technological development. Several aspects of patent law encourage applicants to describe and claim not what they have invented, but rather a vague and overbroad version of their invention. Rather than encouraging accurate disclosure, patent law encourages what has been called “intentional obscurity.”11 The essay then considers how proposals for patent reform fit would likely affect the value of patents for future researchers, concluding that reforms that improve the quality of patent applications for their primary purposes (such as examination, licensing and litigation) would likewise improve their value for the future.

I. Patent records as a primary historical source

Intellectual property has standard stories: The United States has gone from the greatest pirate to the greatest policeman of intellectual property rights. European intellectual property differs from its American cousin because it rests on a philosophical, not economic, grounding. Great inventors differ from mere patent-seeking marketers. Intellectual property faces unprecedented challenges in the light of 21st Century technologies. *Democratization* debunks those stories, using detailed empirical research to more fully explain the role intellectual property law and institutions played in economic

development of the 19th Century United States. *Democratization* draws on several categories of historical sources in addressing a number of historical issues, but relies primarily on the records of the United States Patent Office. Those records contain not just the description of each invention and the claims, but also inventors’ occupations, gender, race, and geographical category; citations to other patents; assignments of patent ownership; and other information.

A familiar tale in intellectual property is the conversion of the United States from nineteenth century pirate to twentieth century policeman. No law school intellectual property course or debate about TRIPS seems complete with mentioning that the United States has only gradually and conveniently come to the side of intellectual property, after freely taking the fruits of other countries’ creators for much of its history. The complaints of Charles Dickens echo more than century later. *Democratization* shows that the United States was, if anything, even more calculating in its attention to whether to give rights to foreigners. In copyright, the tale is true. Only inch by inch, finally ending in 1989, did the United States come to join the international copyright regime. But with respect to patents, the opposite is true. The United States was an early adherent to international patent standards and to recognizing the rights of foreign inventors.

*Democratization* uses patent records and other historical sources to show how the different treatment of copyright and patents made eminent sense for the United States during the “long Nineteenth Century.” As a new nation with a relatively undeveloped literary heritage, the United States had much to gain by disregarding international copyright.12 There was a large body of English language works ready to be harvested. United States publishers were unconstrained by licensing fees, which could benefit

12 See *Democratization* at 222-25.
United States consumers (even if American authors were doubly disadvantaged, by competing against free imports and by lack of protection abroad).

But in the field of patent law, the United States was more ready to compete. Americans were early contributors to technological innovation, and patent law reflected that. Domestically, the United States was quick to implement a thorough patent law and an effective office to administer the law.\textsuperscript{13} Internationally, the US quickly joined international agreements and gave patent protection to foreign inventors. The patent records reflect the widespread impulse in the US to invent – and to seek commercial advantage from patenting inventions. The number of patents per capita was greater in the US than elsewhere.\textsuperscript{14} Influential figures often credited the US patent system for the widespread technological advances in the US, along with its economic benefits.\textsuperscript{15}

United States patent law did differ from the systems in Europe. The differences both reflected and reinforced the democratic nature of the United States, in several senses of the word. In Europe, patent law reflected a more elitist basis. Patents were not given so freely, rather reserved for special inventions. Patent fees were high, making it impracticable for the average inventor to secure intellectual property rights.\textsuperscript{16} The national patent offices were strongly influenced by aristocratic privilege, meaning that social connections were often more important in securing rights than individual inventive contributions. One French applicant included the apparently relevant information that that wife was a wealthy heiress and gave her five first names, along with the name of her

\textsuperscript{13} Democratization at 53.
\textsuperscript{14} Democratization at 62.
\textsuperscript{15} Democratization at 54 (quoting contemporary observer: “The cheap patent law of the United States has been and still is the secret of the great success of that country.”).
\textsuperscript{16} Democratization at 47, 63-64.
noble family. His application was granted. Drawing on records from the respective patent systems, *Democratization* shows that patentees in Europe were more likely to be from the elite classes than in the US. They were also more likely than in the US to be from the major cities, as opposed the poorer rural regions.

Patent law operated quite differently in the young United States. The patent office was in some senses of the most democratic institutions in the country. Rather than a place of patronage, the patent office was subject to typically American checks and balances. This resulted in greater confidence in the office, with a marked difference in controls on patents. In some European countries, there was no system of patent examination, for fear that examiners would extract favors in exchange for favorable rulings. But because the USPTO was relatively politically independent and trustworthy (relatively!) patent applications were examined before patents issued.

Other limitations were also absent in the US. Patent fees were kept far lower than other countries, allowing far greater social access to patent rights. Even the cost of mailing the application was spared the inventor, under the US Post Office policy to give free postage to patent applications. The standard for patent protection was also lower. Rather than reserving patents for exceptional inventions, patents were granted for even modest contributions to homely technologies.

The USPTO was also relatively more open than other governmental institutions. Inventors were not barred by race or gender from applying for patents. Free blacks secured patents as early as 1821, although slaves were still denied the ability to patent

17 Democratization at 44 n. 55.
18 Democratization at 63.
19 Democratization 59-60.
20 Democratization at 51-53.
21 Democratization at 59.
their inventions. Women regularly received patents, although family and property law often denied them the ability to fully exploit their inventions commercially. Low patent fees and a straightforward examination process meant that lack of wealth, education, or connections would not a bar to patent protection.

Democratization then goes beyond describing the differences in social and legal factors in the US patent system to detailed empirical investigation of the social effects of those differences. The more open US system did affect the actual access by inventors. The number of patents issued per capita in the United States was much higher than in other countries. Democratization then traces a number of specific economic repercussions. The occupations of patentees, as disclosed in applications, reflected shifts in economic activity. For several decades beginning in 1790, most patentees were involved in bringing goods into the country, such as merchants. As economic development opened up more spheres of domestic manufacturing (as opposed to relying on imports from more developed countries), so the range of patentee’s occupations broadened, to include artisans, engineers, and manufacturers. By 1860, merchants had gone from the majority of patentees to less than 3.3 %.

Democratization also mines the patent records to explore whether inventors tended to specialize in particular sectors of industry. One might expect increasing specialization over time, as technology became more sophisticated, making it more difficult for inventors to work broadly or in multiple fields. But Democratization found (after controlling for such variables as region, access to transportation, and urbanization)

\[22\] Democratization at 124-25.
\[23\] Democratization at 129-81.
\[24\] Democratization at 114.
\[25\] Democratization at 115.
\[26\] Democratization at 115-16.
no trend toward specialization. Very likely market incentives to work broadly counterbalanced technological barriers.

*Democratization* uses the patent records to explore the characteristics of prolific inventors. “Great inventors,” it transpires, sought patents in patterns quite similar to ordinary inventors. The popular culture figure of the great inventor, struggling to push technology forward and detached from others’ concerns about commerce, does not withstand statistical analysis of patent records. Prolific inventors sought patents in profitable areas of commerce, changed areas of technology along with changes in the overall economy, moved their workplaces to locations with low transportation costs and ready markets, and filed applications in patterns that corresponded with rose and fell with economic cycles of expansion and recession. The characteristics of prolific inventors, however, changed over time. During the early 19th Century, they tended to lack formal education, and concentrated in areas that rewarded “trial and error experimentation.” In later decades, with increasing complexity in technology and commerce, prolific inventors tended to have formal training in science or engineering.

The historical perspective of *Democratization* shows that many of today’s patent controversies are old wine in new bottles. Much is said of how today’s rapidly changing technologies offers special challenges to intellectual property law. But many “new” developments are new versions of old stories. There is concern that the increase of patenting along with the spread of patent subject matter will lead to patent thickets, areas of technology such as software where innovation is hemmed by patents. But patents have

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27 *Democratization* at 118.
28 *Democratization* at 120.
29 *Democratization* at 188.
30 *Democratization* at 187-88.
31 *Democratization* at 220.
often been somewhat concentrated. Swiss inventors seeking US patents in the 19th Century, for example, were strongly skewed toward the areas of music boxes and watches. Others have shown early concerns about patent thickets in such areas as sugar manufacturing.

Today’s patent problems have naturally led to proposals that the standards for patents should be raised. The KSR case presently pending before the Supreme Court turns on the proper standard for holding that an invention is nonobvious and therefore patentable. Some, including the U.S. Solicitor General, have argued that exclusive rights could be limited to only exceptional innovations. *Democratization* exhaustively shows, however, one considerable advantage to the early US economy was that incremental inventions could be patented, meaning there was considerable incentive for modest invention, and resources were directed that way. That suggests that the problem today may be not that too many modest inventions are patentable, but rather that patents are issuing where there is insufficient disclosure to show whether the applicant has truly invented anything.

Recent years have seen a number of movements actively disavowing intellectual property rights. The free software movement, also known as open source software, developers give up most of their rights in their code (patent, copyright, trademark, and

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32 *Democratization* at 292.
33 See Bronwyn H. Hall, Issues in and Possible Reforms of the U. S. Patent System 3 (2006)(symposium paper) (dating before 1865: “In the manufacture with which I am connected – the sugar trade – there are somewhere like 300 or 400 patents. Now, how are we to know all these 400 patents? How are we to manage continually, in the natural process of making improvements in manufacture, to know which of these patents we are at any time conflicting with?”).
trade secret) in software they have developed. Other authors use licenses like the
Creative Commons License to effectively put their writings in the public domain.

Democratization reminds us that the constraints of intellectual property law have
similarly rankled the very authors and inventors who could use it. Patent dissenters in the
1800’s deliberately left their inventions unpatented, in the public interest. Patent
abolitionists in a number of countries sought the repeal of patent laws, even succeeding in
Holland for a number of years.

Democratization shows the great value of patent records as research sources,
relying on them for several types of historical work: social, political, technological, and
economic. The book fits into a long line of works using patents as primary research
sources. This section turns to the value of today’s patents for future researchers.

II. Today’s patents as tomorrow’s history

A future historian working with today’s patents would have much material to
work with. Less than one million patents were issued during the 19th Century. Almost
one million patents were issued just in the years 2000 through 2005. The range of
patentable subject matter has increased dramatically in recent decades, to include such
areas as software, biotechnology, and business methods. So patents would seem to
provide a trove of information for researchers in many areas.

35 See generally Stephen M. McJohn, The Paradoxes Of Free Software, 9 George Mason Law
36 See creativecommons.org.
37 Democratization at 205.
38 Democratization at 289-90.
40 Id.
41 See, e.g., State Street Bank & Trust Co. v. Signature Financial Group, Inc., 149 F.3d 1368, 1373
(Fed. Cir. 1998)(affirming that business methods are patentable).
The information in those patents, however, is likely to be much less helpful than a researcher would hope. A common justification for patent rights is the implicit bargain: an inventor discloses her invention in exchange for a grant of exclusive rights. So rather than using the invention as a trade secret, she makes it public in exchange for legal protection against copiers. She has to make several types of disclosure: the written description must describe the invention, along with the best mode of making and using the invention. The claims must claim what is new about her invention, entitling her to a patent. She must also disclose relevant prior art of which she is aware, meaning she must tell the USPTO of things like other patents, technology, and publications which would be relevant in deciding if her claimed invention is indeed new and nonobvious.

That scheme sounds good not just for the patent office and courts and others interested in the technology, but for future historians. Someone in 2060 writing about the early years of internet commerce would have many patents to read, on such inventions as online business methods and efficient means of handing network traffic. The researcher might expect the patents to fully disclose what the claimed invention was, what its important features were, what various ways it could be embodied in different technologies, what other devices had come before, and how the advantages and disadvantages of the patented invention compared to other existing technology. But patent law, in its present state, discourages applicants from fully disclosing those matters.

42 See, e.g. Bonito Boats v. Thunder Craft Boats, 489 U.S. 141, 151 (U.S. 1989) ("The federal patent system thus embodies a carefully crafted bargain for encouraging the creation and disclosure of new, useful, and nonobvious advances in technology and design in return for the exclusive right to practice the invention for a period of years.").


44 In the age of email, electronic archives, and digital memory generally, present inventors are likely to leave many more traces than those of the 19th Century. But patent records will remain important, because other records are likely to be less organized and publicly accessible than patent databases.
Rather, experts in claim drafting offer the following advice to inventors and patent drafters:45 Do not define the terms used in your claims. Do not identify the category of invention in the preamble to the claims. Do not identify features of the invention as “important.” Do not even use the word “invention” in the written description. Such claim drafting has been described as a trend toward “intentional obscurity.”46 The case law similarly encourages limiting the disclosure in the written description. Do not explain the flaws of competing technology, or the advantages of the claimed invention. If the invention is software-related, do not submit a copy of the program code. Do not do a prior art search to see if others have invented similar technology, because you will then have to submit any relevant prior art along with your patent application. Do not even keep up on technology in the field, because if you find out that others have developed relevant technology, you will likewise have to let the USPTO know. As to describing the “background of the invention”: one patent litigator regards it an “admission against interest.”47

In short, while an inventor might want to set down her role in the development of technology as fully as possible in her patent application, her patent practitioner may advise her to do exactly the opposite: Disclose only what is necessary to get your patent, because more disclosure gives courts more grounds to read your claims narrowly. As to knowledge of the field generally, avoid learning about relevant prior art, then you do not have to disclose it. If real property had such rules, then a party filing a deed, rather than

45 The legal rules prompting such advices are discussed infra.
47 Jeffrey L. Snow, Claim Drafting Issues from the Litigator’s Point of View, Tactics for Mastering Markman Issues (October 20, 2006)(patent law presentation).
giving the location of the property in metes and bounds, would simply disclose that she claims some real estate, of unspecified dimensions, somewhere in the vicinity.

To take one example, Albert Einstein’s 1930 patent on a refrigerator would likely have been drafted much less lucidly today. Einstein’s patent, reflecting his practical and commercial interest in refrigeration, has been explored by numerous writers. This side of him contrasts with his popular image as an abstract, nonworldly genius. The patent is a clear exposition of the invention of Einstein and Leo Szilard. So clear, that it violates several of today’s obfuscatory patent drafting tips in the first two paragraphs. Its first words are “Our invention,” a phrase to be avoided.48 The second paragraph explores “the objects and advantages of our invention,” aspects which a canny drafter today would avoid, because they could be used to limit the scope of the claims to a refrigerator with precisely those attributes.49 The patent then goes on to discuss “a preferred embodiment of our invention,” a phrase to be avoided for the same reason (risking limiting the scope of the claims to that particular embodiment).50 The claims begin with the preamble “refrigerating apparatus,” where claim drafting practice often advises to dispense with a preamble, because it means that the claim will not be read to encompass other possible uses of the technology developed in the future.51 Overall, the written description and claims convey precisely what the inventors have developed and how it fits into the relevant field of technology. Such a document has proved useful to many Einstein biographers (and even writers on refrigeration). One doubts if the sort of vague,

49 Id.
50 Id.
51 Id. at 2.
generalized, overbroad application encouraged by today’s patent law would have told any more than that Einstein had done something or other in the area of refrigeration.

Patent’s law strange discouragement of disclosure flows partly from the relationship between the written description and the claims. The claims define the scope of patent rights. Claims must use words to describe inventions. Lawyers, of course, fight over interpreting words in every area of the law: interpretation of statutes, judicial decisions, contracts, regulations. Claim interpretation is a key step in patent litigation. The court interprets the claims, to see if they are broad enough to cover the alleged infringer’s technology. Courts must decide such matters as: how broadly does “about” mean in a claim,52 what a “download component” is,53 even what the meaning of “means” is.54

In interpreting the words of the claim, the first place courts look is to the patent itself.55 The written description is often used to interpret the claims. Many decisions have given a narrow reading to apparently broad claims, based on the written description portion of the application. If the written description defines a term used in the claims, the patentee’s right will be limited to that definition, even if it is narrower than the customary meaning of the word.56 Where the written description refers to “the invention,” the claims

52 See Ortho-McNeil Pharm., Inc. v. Caraco Pharm. Labs., Ltd., 2007 U.S. App. LEXIS 1133, 19 (Fed. Cir. 2007)(holding that claim term of “a weight ratio of about 1:5” encompassed only “a range of ratios no greater than 1:3.6 to 1:7.1”).
53 Network Commerce, Inc. v. Microsoft Corp., 422 F.3d 1353, 1359 (Fed. Cir. 2005) (deciding whether “metafiles or Windows Media Player standing alone constitutes a ‘download component’”).
56 See, e.g., Boss Control, Inc. v. Bombardier Inc., 410 F.3d 1372, 1376-79 (Fed. Cir. 2005) (“Because the specification makes clear that the invention involves a two-stage interrupt mode, the intrinsic evidence binds Boss to a narrower definition of "interrupt" than the extrinsic evidence might support.”)
may be interpreted to cover only that specific device.\textsuperscript{57} Where the “background of the invention” section disparaged the use of a serial interface, a patent claim for a personal digital assistant was read to cover only a direct parallel bus.\textsuperscript{58} The court also considered the fact that the applicant had described the use of a direct parallel bus as “a very important feature” of the device.\textsuperscript{59} If a claimed invention has broad use, but the specification focuses on particular applications, the claims may be read narrowly.\textsuperscript{60}

Patent drafters have reacted to such claim interpretation cases with obfuscation, by avoiding the disclosures that triggered narrow readings. As one commentator has ruefully stated, “Patent drafters would do well to ensure that nothing in the patent document is ‘important,’ ‘essential,’ ‘required,’ or the like. Those terms do help the patent readers better understand your preferred embodiment, but in court they will only limit your claim scope.”\textsuperscript{61}

Patent applications must disclose relevant prior art to the patent office. But an applicant need only disclose prior art of which she is aware.\textsuperscript{62} So an applicant need not actively seek relevant material, rather she need only disclose material she knows of.\textsuperscript{63} This creates the perverse incentive to actively avoid learning of other work in the field,

\textsuperscript{58} Inpro II Licensing, S.A.R.L. v. T-Mobile USA, Inc., 450 F.3d 1350, 1354 (Fed. Cir. 2006). See also AstraZeneca AB v. Mut. Pharm. Co., 384 F.3d 1333, 1339-40 (Fed. Cir. 2004) ("Where the general summary or description of the invention describes a feature of the invention (here, micelles formed by the solubilizer) and criticizes other products (here, other solubilizers, including co-solvents) that lack that same feature, this operates as a clear disavowal of these other products").
\textsuperscript{59} Id. at 1354.
\textsuperscript{60} See, e.g. On Demand Mach. Corp. v. Ingram Indus., 442 F.3d 1331, 1340 (Fed. Cir. 2006)(“Although we agree with the district court that the Ross invention does not concern itself with whether the "customer" reads the book or obtains it for resale, the focus of the Ross patent is immediate single-copy printing and binding initiated by the customer and conducted at the customer's site.”).
\textsuperscript{62} See 37 C.F.R. 1.56 (known as Rule 56).
both for inventors and their patent attorneys. Indeed, some applicants fear that if they search prior art, they face the dilemma of a determination that they failed to disclosed prior art or that they disclosed too much prior art, “hiding material prior art amidst "junk" prior art.” Patent applications often do show surprisingly little discolosure of relevant technology.

The claims also serve disclosure, in a sense. The inventor must claim the new and obvious aspect of her invention. Her patent rights are limited to what she claims. So one might think that, at least with respect to claims, there is a strong incentive to set the record straight about the place of the invention in the development of technology. But, as to claims, there is again an incentive against accurate disclosure. Here, the incentive is to claim too much (as opposed to disclosing the bare minimum). An inventor may file multiple claims in her application. Some claims may be rejected. As long as some claims are allowed, the patent will issue. If the inventor, now patentee, sues someone for patent infringement, the defendant will likely contend that the patent is invalid. The court may find some of the claims invalid, and some valid. As long as one of the claims is valid and infringed, the patentee wins. Nowhere along the way is there a penalty for filing too many claims, or for filing claims that are broader than the actual invention. The only risk is that a particular claim may be rejected or held invalid. That does not affect the validity of other claims. The incentive is not for the patentee to draft claims that best match up to what she has actually invented. Her best strategy is to draft lots of claims, ranging from

64 Id. at 695.
65 See generally Gregory Aharonian, Internet Patent News Service, http://www.bustpatents.com/archive.htm (patent news letter that frequently gives examples of issued patents that fail to cite well known work in the relevant area, especially when the work was not patented ("nonpatent prior art")). The news letter also offers cogent criticism of the patent law system.
narrow to broad. The burden is on the USPTO, or subsequent infringers, or anyone else who thinks the patent is too broad, to invalidate the claims – one at a time.

As a record of technological history, the claims are quite suspect. If inventor makes a modest invention, her patent application may well claim that modest invention – but also claim much broader versions of it that she actually could not make. If the patent makes it through the USPTO (as most applications do, valid or not) and no one spends millions of dollars in litigation to have the broad claims patent invalidated, then the patent record would considerably overstate her contribution to technological progress.

The applicant must also provide disclosure that would enable others to make and use the invention.66 But courts have applied the enablement requirement leniently with respect to newer subject matter areas such as software and business methods.67 For example, an applicant for a software patent need not disclose the code that she uses. The level of disclosure is low, even in “good” software patents.68 The lower disclosure requirement for such patents means not just that the patent is easier to get, but that it is more difficult to figure out what (if anything) the applicant has really invented.

The rules governing prior art discourage disclosure, even acquiring knowledge. Democratization was not a history of technology, but rather of the interplay between intellectual property law and economic development. So the book did not look closely at the written descriptions of individual inventions, rather at large data bases of such data as patent citations and categories of invention. But even that basic data, today, is subject to

68 See Martin Campbell-Kelly & Patrick Valduriez, A Technical Critique of Fifty Software Patents, 9 Marq. Intell. Prop. L. Rev. 249 (2005)(analysis of the fifty most cited software patents, concluding that the patents generally represented genuine innovations and were not too broadly drafted, but that the level of disclosure was deficient, showing a need for reform).
distorted disclosure. Patent citations’ role as an indicator of the importance of the invention is undercut where applicants are unlikely to know of or disclose relevant prior art, and the patent examiner is likewise unlikely to uncover it. Even the categories of invention are unreliable, where an applicant is encouraged to claim her invention as broadly as possible (beyond the category of commercial activity where her actual invention arose) and where subject matter such as software and business method can likewise extend very widely. The rest of the application is likely to be no more help in telling a future reader the category of the invention, where a savvy applicant will not specifically describe the background and development of the invention.

All these problems (discouragement of disclosure in the written description and prior art and encouragement of overclaiming) are exacerbated by the expansion of patent subject matter. Patent law now reaches into areas such as business methods and software. Such patents are different than patents on airplanes or xylophones. A patent on a particular machine or drug, regardless of how broadly the claims are worded, is inherently limited to certain spheres of activity. Someone making lawnmowers will not infringe a patent on a flying machine, as long as the lawnmower does not fly. Business method and software patents, by contrast, are often much more abstract, with potential applications across the range of human activities. The abstract nature of new patent subject matter raises many problems for patent policy. It likewise adds to the problems of inaccuracy from limited descriptions and overbroad claims. Where the written description is as spartan as possible, there is little to give concrete meaning to the abstract invention

69 But see John R. Allison & Starling D. Hunter, Spring, On the Feasibility of Improving Patent Quality One Technology at a Time: The Case of Business Methods, 21 Berkeley Tech. L.J. 729 (2006)(study of early years of business method patents, concluding that they were not significantly lower quality than patents in other areas).
claimed.\textsuperscript{70} Where there is no penalty to claiming broadly, an actual abstract invention may well be claimed in even more abstract terms. Such a patent is likely to be somewhat mystifying to someone who later tries to figure out just what the invention was, and where it fit in with what others have done.\textsuperscript{71}

Other rules in patent law, of course, do tend to favor disclosure. An application must at least meet the minimum requirements of a written description and include claims. Sometimes a fuller written description will help in enforcing the patent. A court might find that a claim that on its face appears invalid (because it is indefinite, ambiguous, or overbroad), can be interpreted as valid in light of the written description. Sometimes a patentee’s argument for interpretation of a claim turn will succeed because it best fits with the written description. A definition in the written description will likewise sometimes help the patentee. But these rules are unlikely to outweigh the more specific hazards of providing unnecessary disclosure that may hurt the patentee in litigation. A patentee need not choose between the benefits of limited disclosure (such as reducing the risk of narrow construction) and fuller disclosure (reducing the risk of claims being held indefinite or overbroad). The patentee can get both sets of benefits, because she controls the drafting of the claims. She can seek to draft clearer claims (to reduce risks of indefiniteness, ambiguity, etc.) and she can submit multiple, increasingly broader claims, to hedge the risk of overbreadth.

\textsuperscript{70} See James Bessen & Michael Meurer, Do Patents Work? The Empirical Evidence That Today's Patents Fail as Property and Discourage Innovation, and How They Might Be Fixed (forthcoming)

\textsuperscript{71} Id. There may be an adverse interplay between these problems. Courts confronted with broad patents with little disclosure may strain to construe the claims narrowly, and support such narrow readings by pointing to selected portions of the patent, which in turn suggests to future drafters to disclose even less. [Cf. id. suggesting that Federal Circuit has dealt with dubious patents with ad hoc claim construction]
So today’s patents are a much poorer record of technological history than they could be, compared to a patent law that encourage inventors to fully disclose just what they had invented and where it fit in to the landscape of technology. But the purpose of patent law is not to preserve history, the purpose is to promote innovation by providing incentives to inventors. The patent records are a rich trove for future researchers, but that is simply a nice by-product of the patent system, not its goal. One would not advocate substantial reforms in patent law simply to improve the quality of primary sources for future historians. Changing the incentives would help future historians, but changes in patent law would change its more immediate effects.

Many of the best proposals for patent reform, however, do indeed favor more accurate disclosure by inventors. There is widespread agreement that the patent system itself needs a measure of reinvention. Various studies have found that somewhere between one half and one third of patents that are litigated are held invalid.\footnote{See, e.g., John R. Allison & Mark A. Lemley, Empirical Evidence on the Validity of Litigated Patents, 26 AIPLA Q.J. 185, 205-06 (1998).} This suggests that the patent office is issuing many patents that should have been rejected. The most likely reason is the problem of prior art. A patent examiner lacks the time and resources to accurately determine whether a claimed invention is really new, because that would require knowing about everything relevant that had ever been published or put into public use. Rather, the examiner relies largely on the prior art disclosed by the applicant and the examiner’s own search, which in turn relies heavily on previous patents. Another great problem with patents is the uncertainty of claim interpretation. No one really knows how broad a patent is until the courts have interpreted its claims (if they ever do).
Reforms directed toward such problems often rely on improving the quality of disclosure to the patent office.

Commentators have suggested many means to improve patent quality. Some focus on the applicant. Applicants could be required to do a prior art search themselves, as opposed to simply disclosing prior art of which they know.\(^73\) Applicants could be given the option of paying a higher application fee in exchange (enabling the patent office doing a more thorough search) in exchange for a stronger presumption of patent validity.\(^74\) Other proposals seek to get other parties add prior art to the patent record. A post-grant opposition process would permit other parties (such as competitors, standards organizations, or public interest groups) an opportunity to present evidence of invalidating prior art before a patent is issued.\(^75\)

Other reform measures seek to develop other sources of information. As opposed to changing the legal rules governing disclosure by the applicant, some seek to open up the lines of disclosure to other parties. A number of initiatives seek to improve the prior art available to the patent office. The patent office will attempt a pilot project to implement Community Patent Review, using Wikipedia-like technology, where

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\(^74\) Mark A. Lemley, Douglas Lichtman and Bhaven N. Sampat, What to do About Bad Patents 28 Regulation, No. 4, at 10-13 (Winter 2005-2006).

interested parties are invited to submit material relevant to pending applications. The Electronic Frontier Foundation’s Patent Busting Project solicits knowledgeable parties to identify improperly issued patents that threaten to stifle innovation, and to submit materials tending to show that claimed inventions were not new. Monetary rewards could be given to those who bring forward evidence that invalidates a patent. All of those measures would have the secondary effect of increasing the likely value of patent records as a research source.

Conclusion.

The main purpose of the patent system is not to develop a storehouse of technological history. But better disclosure is closely linked to the functioning of the patent system. The present rules encourage limited and vague description of the invention, blissful ignorance of work by others (and therefore no disclosure of it), and overbroad claiming of the invention. Better disclosure would help the PTO in determining whether a patent should issue, would give better notice of the inventor’s claimed invention to the others interested in the technology, and help courts in claim construction. How to adapt the various rules affecting disclosure affects a delicate balance of patent policies. The long view encouraged by thinking about patents as primary historical sources could be helpful. Much of the present activity in patent reform is driven by specific industries, which have quite different axes to grind. Computer and

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pharmaceutical companies have lined up on opposite sides on many issues, both in Congress and in the courts. Thinking about patents long term is no touchstone, but does emphasize the basic value of accuracy in the annals of invention.