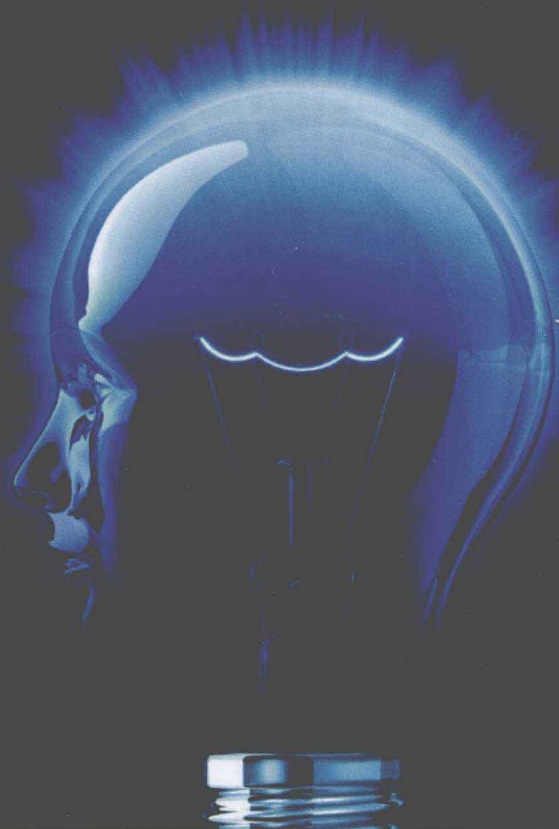




PATENTS

Edited by **JOSEPH SCOTT MILLER**



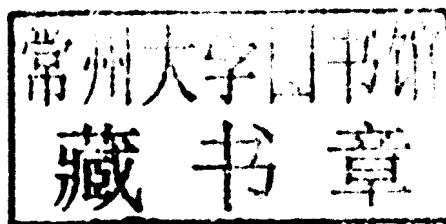
Patents

Edited by

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CRITICAL CONCEPTS IN INTELLECTUAL PROPERTY LAW

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Nature and Function of the Patent System', *Journal of Law and Economics*, **20** (2), October, 265–90.

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Edward C. Walterscheid for his own article: (2005), 'The *Hotchkiss* Unobviousness Standard: Early Judicial Activism in the Patent Law', *Journal of Intellectual Property Law*, **13**, 103–35.

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Introduction

Joseph Scott Miller

In October 1982, US patent law administration changed dramatically: the US Court of Appeals for the Federal Circuit, in Washington, DC, began to hear virtually all patent law appeals from throughout the country – appeals from both Patent Office rejections and from patent enforcement litigation in all the nation’s trial courts. In many ways, 1982 seems so far removed from the world of 2009, with nearly 30 years of development in biotechnology, computing and telecommunications (to name just three technologies that were in their relative infancy then). And yet, against the backdrop of western patent law history, this period is but the blink of an eye. The Congress enacted the first US Patent Act in 1790, almost 220 years ago, and many key phrases in today’s Patent Act date from the 1790, 1793 and 1836 enactments. The first recognizably modern, general patent statute is far older still – from the Republic of Venice, enacted in 1474 (535 years ago now, and 316 years before the first US Patent Act). To pick a set of leading journal articles in the patent law field, amid the sweep of this centuries-long history, is a bit daunting.

How, then, did I choose? Some of my criteria were the expected ones, of course: influence and importance, clarity of expression, diversity of ideas and sources, and the like. But even these screens leave hundreds (if not thousands) of high-quality, high-impact articles that one might profitably gather in a volume such as this one. The most important screen, for me, was an article’s pertinence to long-running questions about the most basic aspects of patent law system design that have been central in this decade.

Consider, first, the pressing policy questions: What type of, and how much, regulatory power should the Patent Office have? A number of recent cases raise these questions, and they are the focus of lively debate at local patent bar meetings. What role should the courts play, compared to the Congress, in establishing patent policy? This question has garnered substantial attention as we enter our fifth consecutive year of deep, detailed congressional consideration of major patent reform bills. How can we implement a reliable creativity threshold that reserves the patent reward only for significant technological advances? This question, inaugurated in 1851 by the Supreme Court’s decision in *Hotchkiss v. Greenwood*, is tackled anew in the Supreme Court’s 2007 decision in *KSR International Co. v. Teleflex Inc.* How abstract a process is *too* abstract for patent protection? The Supreme Court brought this software technology question to the fore more than a generation ago, in *Gottschalk v. Benson* (1972), and confronts it again in the October 2009 Term, in *Bilski v. Kappos*. Finally, what incentives stories, exactly, should guide patent policy? And does the answer differ depending upon the particular technology or industry under discussion? These framework questions hang back, behind the others, shaping all the debates.

More interesting than any of these particular contemporary questions, though, is the fact that, when one steps back to examine the great streams of the patent law literature, one sees immediately that these questions have been with us for decades or, in some cases, more than

a century. This book enriches the context within which to consider these contemporary issues by highlighting some of the core patent law literature about them.

The collection begins with four pieces expressly couched as patent law history. Both Federico (Chapter 1) and Lubar (Chapter 2) examine the first few decades of patent law, under the 1790 and 1836 Patent Acts. These two articles discuss all three types of US patent administration – the Patent Board period (1790–93), the registration system period (1793–1836) and the Patent Office (1836–present). Both papers thus shed light on contemporary questions of patent administration, including the type and scope of regulatory power the Patent Office needs to function effectively. Janis examines the patent abolition movement in Victorian England. Although the movement had no precise counterpart in the US, Janis (Chapter 3) amply demonstrates the relevance of the abolition debates to our current patent reform discussions. In the fourth piece in this section, Walterscheid (Chapter 4) explores what we today consider the Supreme Court’s first case requiring that an invention be nonobvious to be patentable, *Hotchkiss v. Greenwood*.

The collection continues with two additional papers about the nonobviousness requirement. The Supreme Court’s *KSR* decision, in 2007, constitutes something of a ‘reset’ for this jurisprudence. The Court had not considered a nonobviousness case in depth since 1966, in *Graham v. John Deere Co.* (see Kitch, Chapter 5). In the intervening years, the Federal Circuit had – without Supreme Court input – focused the nonobviousness inquiry squarely on avoiding the temptations of hindsight bias. This potential distortion in the inquiry, while important, is not the only vital consideration, and *KSR* has reoriented the field away from so singular a focus. Kitch, in a paper published in the immediate wake of *Graham*, considers a variety of frameworks for determining whether, at the time it was made, an invention would have been obvious to ordinary artisans in the field. Duffy (Chapter 6), in a paper published in the immediate wake of *KSR* – a case in which he was personally involved as an advocate, at the Supreme Court stage – develops the thesis that ‘[t]he most important question to ask in obviousness analysis is thus: “If the innovation were obvious, why was it not created before?”’* As the entire patent system adjusts to the reorientation *KSR* provides, the insights of both articles are invaluable.

At the collection’s crux sit five key articles in the economic analysis of patent law. All five pieces grapple with the patent system’s most basic incentive features. The Merges and Nelson piece (Chapter 7) – one of the more influential pieces in the collection – marries the firmest grasp of the jurisprudence on patent scope with an unsparing reexamination of a patentee’s incentives to innovate, especially in contexts where cumulative innovation (rather than one-shot invention) is the norm. Scotchmer (Chapter 8), writing around the same time as Merges and Nelson, also explores the cumulative innovation question; together with Merges and Nelson, this piece provides a broader vista on how patent incentives play out in real technological contexts. Kitch’s classic paper (Chapter 9) on the prospect theory of patent protection embeds patenting in the broader activity of commercially developing a technology. Duffy (Chapter 10), further plumbng prospect theory, emphasizes the social benefits derived from the technology rivalries that patent law’s rules establish. Heald (Chapter 11) complements these four traditional economic analysis pieces with a quite different perspective. Taking a page from the theory-of-the-firm literature, Heald explores patent law as a means for reducing transaction costs, compared to the trade secret law and contract law alternatives.

The collection continues with three perspectives on the patentability of computer-implemented process inventions, an issue that pushes the limit on the abstractness of the process

inventions that may be patented. Chisum (Chapter 12), patent law's premiere treatise writer, examines the three leading Supreme Court cases on the question – *Gottschalk*, *Flook*, and *Diehr*. He defends the thesis that patent protection should extend to otherwise patentable mathematical algorithms. Newell, a computer scientist, comments directly on Chisum, challenging our frameworks for talking about mathematical algorithms. Finally, Cotter (Chapter 14) urges that traditional limitations on the patenting of computer-implemented processes may embody 'underappreciated wisdom'. In the coming year, in the *Bilski* case, the Supreme Court will tackle this issue for the first time since 1981. Whatever the outcome in that case, the depths of this issue are almost certain to challenge us for many years to come.

The collection concludes with two articles from newer territory in the patent law literature – namely, empirical patent law. Hall and Ziedonis (Chapter 15) document the patent portfolio races among semiconductor makers from the late 1970s to the mid-1990s. In doing so, they augment, in a critically important way, the insights of the economics literature. Allison (Chapter 16) and his three co-authors examine, in unprecedented detail, 'what makes a patent valuable and how to identify valuable patents'.** Both articles yield insights, and further questions, that only detailed empirical work can. And decades from now, when another volume like this is assembled, empirical patent law will surely take up a much larger share of the territory.

All the articles collected here, then, tackle one or more of the long-running questions about the most basic aspects of patent law system design that have been central, not only in this decade, but the last several decades. A question hovers above this cluster of recurring issues: Why do these issues resist durable, settled answers? There are likely to be many answers to this overarching question, each of which is only partial. The answer I favour, at least for the moment, is that these questions about patent office power, creativity thresholds, process patentability and incentive stories endure because it is only by struggling with these questions – by answering them anew, however tentatively – that each generation makes patent law truly its own.

Patent law, as I noted above, is more than 500 years old. And yet it remains as fresh and as lively as it has ever been. Significant portions of the US Patent Act have changed little since 1836, and others have changed little since 1793 (or 1790). And yet the technological world in which we live would be utterly unrecognizable to a patent practitioner transported from that time to this. The patent law's continuity and stability across so many decades of dramatic technological change is due, in part, to the flexible, general terms in which Congress framed these laws. Every bit as important, however, is the zest with which patent practitioners and academicians have embraced the flexibility that the Patent Act's text and structure provide. For example, by my count we are in the sixth major judicial iteration, or era, of the nonobviousness standard since the first began in 1851, for a new phase about once every 25 years. Lawyers and judges in each generation have made patent law real in their own time, translating it from an earlier time, by hammering out – among other things – an answer to the question, how large a step forward technologically should an invention be for us to reward it with patent protection? Aspects of our current approach draw explicitly on the insights of case law from 1851; other aspects draw support from contemporary experience. The same is generally true for the other fundamental questions of patent doctrine and patent administration: by struggling with the enduring questions again, we refresh patent law's flexibility and thus its continuing vital role as an encouragement to innovation.

I could not include all the excellent, and influential, papers that touch on the core patent law questions with which we continue to struggle with today. Moreover, I have left some vital

questions entirely untouched, such as the vexing questions of patent infringement remedies (including the propriety of preliminary or permanent injunctive relief, lost profits models, and the entire market value rule). I hope that, even with these limitations, readers will find great aid in the challenging, forceful articles gathered here.

Notes

- * John F. Duffy, *A Timing Approach to Patentability*, 12 LEWIS & CLARK L. REV. 343, 346 (2008).
- ** John R. Allison *et al.*, *Valuable Patents*, 92 GEO. L.J. 435 (2004).

List of Cases

Bilski v. Kappos, 129 S. Ct. 2735 (2009) (granting review)
Diamond v. Diehr, 450 U.S. 175 (1981)
Gottschalk v. Benson, 409 U.S. 63 (1972)
Graham v. John Deere Co., 383 U.S. 1 (1966)
Hotchkiss v. Greenwood, 52 U.S. (11 How.) 248 (1851)
KSR International Co. v. Teleflex Inc., 550 U.S. 398 (2007)
Parker v. Flook, 437 U.S. 584 (1978)

Part I
Patent Law History

[1]

Operation of the Patent Act of 1790*

*P.J. Federico***

The first patent act passed by the Federal government of this country was enacted April 10, 1790, a little over one year after the organization of the new government.¹ The law was fairly short and comparatively simple. The subject matter for a patent was specified as "any useful art, manufacture, engine, machine, or device, or any improvement therein not before known or used." The inventor, "he, she or they" presented a petition to the Secretary of State, the Secretary for the Department of War, and the Attorney-General of the United States, who were empowered to grant the patent in the name of the United States, "if they shall deem the invention or discovery sufficiently useful and important." The inventor was required to file a specification in writing, a drawing, and a model if possible. These had to be so particular and so exact that the invention could be distinguished from other things before known and used, and that persons skilled in the art could make, construct or use the invention. No oath was required.

Infringement was punished by damages to be assessed by a jury, and by forfeiture of the infringing devices to the patentee. Patents could be repealed within one year by the judgment of a district court, on the complaint of any person, who, however, paid all costs in the event he lost.

The fees were nominal; filing fees of fifty cents plus ten cents per hundred words of specification, two dollars for making out the patent, one dollar for affixing the Great Seal and twenty cents for endorsement and all other services, made the cost of a patent amount to about four or five dollars.

The business of administering the act was organized in the Department of State. The act provided that this Department keep the books and records, receive the papers filed, and perform other duties.

*Reprinted from 18 JPOS 237, April 1936.

**Editor of the JPOS from August 1935 to September 1941.

¹The full text of this act, together with the proceedings in Congress leading to its adoption, are given in "The First Patent Act," 14 J.P.O.S 237-252, April, 1932.

In fact on the same day that the patent act was passed by Congress, a resolution providing for an additional clerk for the Department of State, presumably to take care of the expected increase in the work of that Department due to the handling of the patent business, was considered.

As stated above, the power to grant patents was completely vested in a board or commission consisting of three members; the Secretary of State, the Secretary of War and the Attorney General. They, or any two of them, could grant a patent if they found the invention "sufficiently useful and important." They also fixed the term of each patent, but not to exceed fourteen years. The Attorney General was given the responsibility of deciding the correctness of a patent as to form, and his certification on the patent was required. The President of the United States and the Secretary of State also signed the patent.

The members of the first board, who called themselves the "Commissioners for the Promotion of Useful Arts" and who were also called the "Patent Commission" and the "Patent Board", were Thomas Jefferson, Secretary of State, Henry Knox, Secretary of War, and Edmund Randolph, Attorney General. The moving spirit of the Board was Thomas Jefferson, not only because his department was charged with most of the responsibility, but because work of a scientific and technical nature was particularly appealing to him. He may justly be called the first administrator of our patent system.

From the standpoint of scientific and intellectual attainments, Thomas Jefferson was perhaps the public person in the United States most suited to administer the patent law. He was the most accomplished and versatile man in public life and was a zealous and industrious patron of science and the arts. Mathematics was one of his favorite studies; he was proficient in astronomy and calculated the eclipse of 1778 with accuracy; he was able to read Greek, Latin, French, Spanish and Italian, and he had some knowledge of civil engineering, physics, mechanics, architecture, meteorology, anatomy and botany. He designed, in addition to his home, Monticello, the residences of several of his neighbors, the State Capitol of Virginia, the buildings of the University of Virginia, and a prison for the state. He never lost an opportunity to promote a scientific enquiry or to add a new fact to the information of mankind and was ever zealous in encouraging the introduction of new things and the application of science to everyday affairs. For example, in one letter he writes, "I have wished to see chemistry applied to domestic objects, to malting,

brewing, making cider, bread, butter, cheese, soap and the incubation of eggs."²

Thomas Jefferson was also an inventor of considerable merit, having invented a number of useful and ingenious devices. His most useful invention was that of the correct form for the mould board of the plough, for which he was given several medals by French scientific societies. Another of his inventions was a revolving chair which can still be seen at Monticello. His political opponents called it "Jefferson's Whirligig" and said that he had invented it "so as to look all ways at once." A camp chair or stool which could be folded up into a walking stick, a pedometer for counting the number of steps taken in walking and thereby measuring the distance travelled, and a machine for treating hemp are also numbered among Thomas Jefferson's inventions.³

Jefferson became an enthusiastic supporter of the patent system, but before his intimate contact with its beginnings, he was strongly opposed to monopolies of all kinds. His opposition to monopolies and a full realization of their abuse extended for a while to patents for inventions and created a passing belief that the government should not interfere in matters of invention.⁴ At the time that the new Federal Constitution was proposed, Jefferson was in France and, when he learned of it, he expressed dissatisfaction with the absence of a bill of rights. This bill of rights should provide "clearly and without the aid of sophism . . . for the restriction of monopolies."⁵

In July of the next year, 1788, he rejoiced at the adoption of the Constitution and amplified his views on monopolies:

I sincerely rejoice at the acceptance of the new Constitution by nine States. It is a good canvas, on which some strokes only want retouching. What these are, I think are sufficiently manifested by the general voice from north to south, which calls for a bill of rights. It seems pretty generally understood that this should go

²For a fuller discussion of Thomas Jefferson's scientific abilities and his inventions see Wm. I. Wyman, "Thomas Jefferson and the Patent System," 4 J.P.O.S. 5-8, Sept, 1918, and Levi N. Fouts, "Jefferson the Inventor, and his relation to the Patent System," 4 J.P.O.S. 316-331, March, 1922.

³None of Jefferson's inventions were patented. In a letter describing the hemp-brake he stated that he intended to describe it anonymously in the public papers in order to forestall some interloper from patenting it. Writings of Thomas Jefferson, Ed. by H. A. Washington, Vol. V1, page 506 (1815).

⁴Letter to M. Hommade, Washington Edition, Vol. II, page 236 (1787), and Letter to Madison *infra*.

⁵Letter to Madison. Writings of Thomas Jefferson, Ed. by P. L. Ford, Vol. IV, page 476 (Dec. 1787).

to * * * monopolies. * * * The saying there shall be no monopolies, lessens the incitements to ingenuity, which is spurred on by the hope of a monopoly for a limited time, as of fourteen years; but the benefit of even limited monopolies is too doubtful to be opposed to that of their general suppression.⁶

However, the next year found his opinion, possibly after some study of the Constitution and further reflection on the encouragement of inventions, changed to favor limited monopolies for inventions and writings:

I like the declaration of rights as far as it goes, but I should have been for going further. For instance, the following alterations and additions would have please me. . .

Article 9. Monopolies may be allowed to persons for their own productions in literature, and their own inventions in the arts, for a term not exceeding—years, but for no longer term and for no other purpose.⁷

Subsequent experience, including his personal contact with patents, convinced him of the importance of the patent system, and that an inventor should be rewarded by a limited monopoly, as shown from a few quotations from his letters.

An act of Congress authorizing the issue of patents for new discoveries has given a spring to invention beyond my conception. Being an instrument in granting the patents, I am acquainted with their discoveries. Many of them indeed are trifling, but there are some of great consequence, which have been proved of practice, and others which, if they stand the same proof, will produce great effect.⁸

* * *

In the arts, and especially in the mechanical arts, many ingenious improvements are made in consequence of the patent right giving exclusive use of them for fourteen years.⁹

* * *

Certainly an inventor ought to be allowed a right to the benefit of his invention for some certain time. . . Nobody wishes more than I do that ingenuity should receive liberal encouragement.¹⁰

But the term of the patent grant should be limited in time and not be perpetual. A perpetual monopoly would “embarrass society with monopolies for every utensil existing, and in all the details of

⁶Letter to Madison. Ford Edition, Vol. V, page 45, (July 1788).

⁷Letter to Madison. Ford Edition, Vol. V, page 113 (Aug. 1789).

⁸Letter to Benjamin Vaughan. Washington Edition. Vol. III, page 158 (June 27, 1790).

⁹Letter to M. Pictet. Washington Edition, Vol. IV, page 462 (1803).

¹⁰Letter to Oliver Evans. Washington Edition, Vol. V, page 75 (1807).

life."¹¹ Jefferson also did not believe in the granting of patents for small details, obvious improvements, or for frivolous devices; he was a believer in a high standard of invention.¹²

The philosophy of property rights in inventions and writings also occupied the mind of Jefferson and in this matter his views are most modern. There is no natural property right in an invention, but such rights are the creation of society, as expressed in a letter:

But while it is a moot question whether the origin of any kind of property is derived from nature at all, it would be singular to admit a natural and even hereditary right to inventors. It is agreed by those who have seriously considered the subject, that no individual has, of natural right, a separate property in an acre of land, for instance. By an universal law indeed, whatever, whether fixed or movable, belongs to all men equally and in common, is the property for the moment of him who occupies it; but when he relinquishes the occupation, the property goes with it. Stable ownership is the gift of social law, and is given late in the progress of society. It would be curious, then, if an idea, the fugitive fermentation of an individual brain, could, of natural right, be claimed in exclusive and stable property. If nature has made any one thing less susceptible than all others of exclusive property, it is the action of the thinking power called an idea, which an individual may exclusively possess as long as he keeps it to himself; but the moment it is divulged, it forces itself into the possession of every one, and the receiver cannot dispossess himself of it. Its peculiar character, too, is that no one possesses the less, because every other possesses the whole of it. He who receives an idea from me, receives instruction himself without lessening mine, as he who lights his taper at mine, receives light without darkening mine. That ideas should freely spread from one to another over the globe, for the moral and mutual instruction of man, and improvement of his condition, seems to have been peculiarly and benevolently designed by nature. When she made them like fire, expansible over all space, without lessening their density in any point, and like the air in which we breathe, move, and have our physical being, incapable of confinement or exclusive appropriation. Inventions then cannot, in nature, be a subject of property. Society may give an exclusive right to the profits arising from them, as an encouragement to men to pursue ideas which may produce utility, but this may or may not be done according to the will and convenience of the society, without claim or complaint from anybody.¹³

¹¹Ibid. Another reason why the term should be limited is given in this letter; the natural understanding of the members of society would eventually suggest the same utensils and details, or others just as good.

¹²Letter to Thomas Cooper. Washington Edition, Vol. VI, page 295 (1814), as well as other letters referred to *infra*.

¹³Letter to Isaac McPherson. Washington Edition, Vol. VI, page 180 (1814).

The three members of the patent board met from time to time and discussed the applications for patents which had been presented to them. Sometimes a day for a hearing would be appointed, at which time the petitioner would explain his case in person. The meetings were not as frequent as could have been desired and the work proceeded slowly since each application received a thorough and severe scrutiny. As might be expected, the board gradually developed a few rules and regulations, as to matters of form as well as to matters of substance. Certain standards were set up with respect to the drawings and specifications. A personal letter from Jefferson probably represents an action on an application for patent. The letter begins:

Unremitting business since the meeting of Congress has obliged me to a rigorous suspension of my correspondence, and this is the first day I find myself at liberty to resume them, and to acknowledge the receipt of your favor of Dec. 10. The drawings, etc. were immediately laid before the board of arts, who, adhering to a general rule, desire a model of your invention and a more ample description, as also more complete drawings. . .¹⁴

The Board was also concerned with questions of what constitutes patentable invention. Certain types of changes, which recur in deciding questions of invention were recognized by the Board. Problems of substitution of materials, new uses of old machines or devices, changes in form, and even combination and aggregation confronted the Board just as they confront the examiner today. But the Board had no background of a long line of adjudicated cases and they recognized the difficulty of laying down general rules. Writing about twenty years later, Thomas Jefferson recalled some of the experiences of the Board.

Considering the exclusive right to invention as given not of natural right, but for the benefit of society, I know well the difficulty of drawing a line between the things which are worth to the public the embarrassment of an exclusive patent, and those which are not. As a member of the patent board for several years, while the law authorized a board to grant or refuse patents, I saw with what slow progress a system of general rules could be matured. Some, however, were established by that board. One of these was, that a machine of which we were possessed, might be applied by every man to any use of which it is susceptible, and that this right ought not to be taken from him and given to a monopolist, because the first perhaps had occasion to apply it. Thus a screw for crushing plaster might be employed for crushing corncobs. And a chain-pump for raising water might be used for raising

¹⁴Letter to Robert R. Livingston. Ford Edition, Vol. V, page 276 (Feb. 4, 1791).