In the 1964 Term, it was news of importance to the patent bar, though of little note elsewhere, that the Supreme Court had, for the first time in fifteen years, undertaken to review some patent cases turning on the issue of invention. The Court had granted certiorari to consider the effect of the standard of non-obviousness imposed by § 103 of the Patent Act of 1952 on theretofore judicially developed tests of invention.

The interest of the patent bar derived from a widespread concern that the Court might use § 103 as a basis for promulgating more rigorous standards of invention than had yet been utilized. Indeed, after the Court had granted certiorari in Graham v. John Deere Co., 379 U.S. 956 (1965); United States v. Adams, 380 U.S. 949 (1965); Calmar, Inc. v. Cook Chemical Co., 380 U.S. 949 (1965); Colgate-Palmolive Co. v. Cook Chemical Co., 380 U.S. 949 (1965).

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

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3 35 U.S.C. § 103 (1964): "A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made."
Deere Co., in order to resolve a conflict between the Fifth and Eighth Circuits, the Solicitor General had invited the Court "to consider pressing problems relating to the administration of the patent laws in a variety of contexts and in broad perspective." This language took on an ominous sound when the Court accepted the invitation and granted certiorari in United States v. Adams and the twin cases of Calmar, Inc. v. Cook Chemical Co. and Colgate-Palmolive Co. v. Cook Chemical Co.

The Court was inundated with a shower of amicus curiae briefs revealing an apprehension that the Court would utilize the new statutory language as a valve to cut down the flow of patents that pour forth from the Patent Office each year. The worry of the patent bar was perhaps expressed most frankly in an amicus brief filed by Professors E. Ernest Goldstein and Page Keeton of the University of Texas patronizingly entitled "Brief Amicus Curiae in Support of 35 USC 103." Such a brief was necessary, wrote these self-appointed defenders of the statute, "because some writings by some Justices of this Court and the opinions by the Court of Appeals in this case, appear to put the practical operating life of the patent system at stake, and to put the whole socio-economic functioning of the entire patent system at issue."

The decisions that the Court has rendered may assuage this fear. They expressly purport to follow the earlier decisions and to turn

5 The Fifth Circuit had found the patent valid in Graham v. Cockshutt Farm Equip. Co., 256 F.2d 358 (5th Cir. 1958), and Jeoffroy Mfg. Inc. v. Graham, 219 F.2d 511 (5th Cir. 1955).
6 The Eighth Circuit had held the patent invalid. John Deere Co. v. Graham, 333 F.2d 529 (8th Cir. 1964).
7 Petition for Certiorari, pp. 15-16, United States v. Adams.
10 The amicus curiae briefs were filed by the American Bar Association, the New York Patent Law Association, the Illinois State Bar Association, the State Bar of Texas, and the School of Law of the University of Texas.
11 In a concurring opinion in the Supermarket case, note 1 supra, Mr. Justice Douglas, joined by Mr. Justice Black, had observed "how far our patent system frequently departs from the constitutional standards" and accused the Patent Office of having "placed a host of gadgets under the armor of patents." 340 U.S. at 154, 158.
12 Amicus Curiae Brief of the School of Law of the University of Texas, pp. 1-2, Graham v. John Deere Co.
toward neither leniency nor harshness. "We believe," wrote Mr. Justice Clark for the Court, "that the revision [in 1952] was not intended by Congress to change the general level of patentable invention."\textsuperscript{13} And, if actions speak louder than words, the Court held a patent valid for the first time in twenty-two years.\textsuperscript{14} The opinions leave the impression that the decisions represent a mere ripple in the long stream of the law of invention and that the Court will now leave that complicated and hopelessly technical subject to the care of the courts of appeals for another fifteen years. But in fact the cases may, indeed, foreshadow an important doctrinal clarification of what has been a needlessly confused concept.

The petitioner in \textit{Deere} eschewed the arguments offered by the amici curiae and asserted instead that "there can be no doubt that Congress has spoken and has defined for the first time a statutory requirement for patentable invention. The wording of the statute is clear and should be followed."\textsuperscript{15} In essence, he argued that the Court of Appeals for the Eighth Circuit had erroneously used a standard of invention that required proof of a new or different result in order to sustain the validity of the patent. The patent involved in \textit{Deere} was on an improved clamp whose structure is difficult to describe but simple to understand from a diagram. The clamp was designed to provide a strong connection between the shank of a plow and the implement frame. The important feature of the clamp was that it permitted the shank to pivot upward when the plow point struck rocks, preventing damage. The patented clamp was an improvement on an earlier clamp that functioned in the same way and was also developed and patented by Graham. By having the shank pass under instead of over the pivot point and providing a rigid connection between the end of the shank and the clamp, Graham had designed a clamp that would perform better because of less wear and because it offered minutely greater freedom of movement along the whole length of the shank.

The Eighth Circuit had rejected this as a ground of patentability because "the inversion of the parts so as to allow the

\begin{itemize}
  \item \textsuperscript{13} 383 U.S. at 17.
  \item \textsuperscript{15} \textit{Brief of Petitioner Graham}, p. 25, Graham v. John Deere Co.
\end{itemize}
shank to flex downwardly away from the plate above it did not bring about a significantly new or different result." On this issue it differed from the Fifth Circuit, which had found the patent valid because of the rule "long recognized by this Court, that an improvement combination is patentable even though its constituent elements are singly revealed by the prior art, where, as here, it produces an old result in a cheaper and otherwise more advantageous way." A concern with "result" as a test for invention has venerable origins in American patent law, but the petitioners in *Deere* argued with complete persuasiveness that "nowhere in [the] ... statute is there any requirement that to be patentable an invention must produce a new result." The Court agreed, concluding "that neither Circuit applied the correct test."

By rejecting the "result test" of invention, the Court brought to an end a standard of patentability that has created confusion for far too many years. Even more important is the implication that in the future § 103 can be used to eliminate other historic tests of invention that have no rational relationship to the non-obviousness inquiry required by § 103. It is thus that the approach adopted by the Court in *Deere* may make it an important turning point in the history of American patent law. But to understand this possibility it is necessary first to understand the history.

The generally received history seems to be that the non-obviousness test of § 103 was articulated in the very first patentability case before the Supreme Court, *Hotchkiss v. Greenwood*, and has remained the test of invention ever since, with the possible exception of certain "hostile" Supreme Court decisions after 1930. Thus, the Supreme Court concluded in *Deere* that § 103 "was intended to codify judicial precedents embracing the principle long ago an-

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16 333 F.2d at 534.
17 219 F.2d at 519.
18 *Supra* note 15, at 26.
19 383 U.S. at 4.
20 11 How. 248 (1851).
21 Discussion of this thesis generally centers on Great Atl. & Pac. Tea Co. v. Supermarket Equip. Corp., 340 U.S. 147 (1950), and Cuno Eng'r Corp. v. Automatic Devices Corp., 314 U.S. 84 (1941), as the most hostile. But under the non-obviousness test, the *Supermarket* case was clearly right on its facts and *Cuno* arguably so. *General Elec. Co. v. Jewel Incandescent Lamp Co.*, 326 U.S. 242 (1945), discussed below, appears really to be the most hostile: wrong both on its facts and its law. But two Terms earlier the Court had held a doubtful patent valid. *Goodyear Tire & Rubber Co. v. Ray-O-Vac Co.*, 321 U.S. 275 (1944).
nounced by this Court in *Hotchkiss.*" And at oral argument all counsel appeared to agree that the test of invention is the same today as it was a century ago.

The idea that the history of a test for invention has so stable a continuity, however, is simply misleading. The history of invention in American patent law only begins to make sense if it is first understood that there have been not one but three different tests which, during the twentieth century, have existed side by side in the decisions of the courts. Section 103 can properly be construed as a selection of one of those three tests and a rejection of the other two. If it is so construed, the law based on the other two tests should now be rejected. Until *Deere,* however, the lower federal courts were not dealing with § 103 in this way. Rather they seemed to assume that since § 103 dealt with invention, all prior law dealing with invention was relevant in applying the section to particular cases. For example, even though Judge Hand recognized that § 103 had changed the prior law, his decision in *Lyon v. Bausch & Lomb Optical Co.* apparently would preserve as relevant all earlier tests of invention no matter what their doctrinal underpinnings.

This incorporative approach is apparent in the history of the *Graham* patent litigation. The Fifth and Eighth Circuits turned to the issue of "result" because they were dealing with a problem of "invention," and the case law on "invention" is full of talk about result. But result is a subject of inquiry related to one of the two tests rejected by § 103. The Supreme Court properly rejected its use as a focus of inquiry. Similar treatment should be afforded other subjects of inquiry based on the tests rejected by *Deere.* For they, too, can no longer be relevant.

I. THE THREE TESTS

The three distinct tests of patentability can be denominated, in the order of their historic development, the "novelty" test, the "genius" test, and the "non-obviousness" test. It is the thesis of this paper that only the last survives the decision in *Deere.*

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22 383 U.S. at 3-4.
24 224 F.2d 530 (2d Cir. 1955).
A. THE NOVELTY TEST

The novelty test focuses inquiry on a simple question: Is the device new? If the device is new, then it is patentable. This was the test of the Statute of Monopolies and of the American patent acts of 1793, 1836, and 1870.

In its simple, natural form, the rationale can be stated as follows. In the specification of his patent the inventor has given to society something that is, by definition, new, something that society did not have before. Because he has given this to society, it is only natural justice that society should give him the exclusive right to its commercial development.

If one prefers an economic justification to one based on "natural right," an argument can also be made that the test of patentability should be "newness." In this view, the purpose of the patent system is not only to encourage invention but to encourage the production and marketing of new products. A new process or product that would be of marginal entrepreneurial interest when facing free entry might become an attractive investment proposition if the right to commercial development were exclusive. Thus, in 1837 Willard Phillips wrote in his Law of Patents for Inventions:

[W]ithout some encouragement and hope of indemnity for expenses, held out by the law, many inventions, after being made, would not be rendered practically useful. . . . Now without the encouragement of a patent, how is any man to engage in a novel and expensive process, if the moment he succeeds, at the cost of all this outlay, he must be sure that his neighbors, who were cautious enough to shun all chances of loss, will come into competition with him, and make the remuneration of all this outlay impossible?

In 1942, Judge Frank stated this rationale at some length:

[T]here seems still to be room for some kind of patent monopoly which, through hope of rewards to be gained through such a monopoly, will induce venturesome investors to risk large sums needed to bring to the commercially useful stage those new ideas which require immense expenditures for that pur-

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25 21 James I c.3 (1623).
27 5 Stat. 117 (1836).
26 1 Stat. 318 (1793).
28 16 Stat. 198 (1870).
30 Picard v. United Aircraft Corp., 128 F.2d 632, 642 (2d Cir. 1942) (concurring).
pose.... [I]f we never needed, or do not now need, patents as bait for inventors, we may still need them, in some instances, as a lure to investors.

Judge Frank recognized the argument against this position. "Some persons, to be sure, argue that the too rapid obsolescence of plant and equipment through new developments is socially undesirable." His response was both unanswerable and unresponsive. "[R]etardation of our nation's technology now seems of doubtful value since it weakens preparedness for war with another country which has not similarly, in pre-war days, retarded its technology."

This same reasoning controls important governmental policies at the present time. In 1965, the Administrator of the National Aeronautics and Space Administration informed a committee of the United States Senate, with obvious satisfaction, that patents developed on NASA research contracts at government expense would be available for only two years on a non-exclusive, royalty-free basis. But "after the 2-year period, if the benefits of the invention have not been brought to the public, NASA will grant an exclusive license to exploit the invention."

This is either sloppy or bad economics. It is sloppy because there is no effort to clarify whether the costs of commercial development that investors should be induced to meet are costs that must be borne by any entrant into the field, or whether they are costs of innovation that must be borne by only the first entrant. If they are of the latter kind, the point is reasonably sound. But it can be taken care of either by granting patents for the first innovation—the one to be developed—or by granting patents for the additional innovations that are necessary before commercial exploitation is achieved. An advocate of the non-obviousness test—to jump ahead for a moment—would argue that if commercial development requires only the exercise of the ordinary skill of the art, it hardly requires a patent to call it forth. In addition, it should be noted that the whole issue is in part a false one since the development work that concerned Judge Frank and the director NASA (nylon is commonly given as the great example) will usually involve processes and

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31 Id. at 645. 32 Ibid.

technical know-how that can probably be kept secret for a substantial period of time.

If the costs that concerned Frank and the director of NASA are of a kind that must be borne by every entrant into the field, costs such as investment in production and marketing facilities, then the argument is bad economics. Neither Frank nor the director of NASA seems to realize that there is no a priori principle dictating that the development of the new is the best use of capital resources. If capital can earn a higher return elsewhere absent the prospect of monopoly for the new product, it may well be because that capital is better applied to the alternative use. But that is a point directly contrary to the very existence of NASA, an existence which can be rationalized only by means of an appeal to national defense or national honor, the same unanswerable and yet unresponsive argument that Frank offered. But again, both NASA and Frank make the same error by assuming that "retardation" of commercial exploitation is the same thing as "retardation" of technology. They are not necessarily the same. An adequate military or space technology potential is not assured by incentives for commercial innovation. And, conversely, the costs of developing and maintaining this technological potential are not reduced by the grant of monopoly incentives to include "spinoff" in the civilian economy.

B. THE GENIUS TEST

The genius test is an extension of the natural law argument for the novelty test. But it is based on a negative economic premise about patents. A patent monopoly is costly to the consumer and should not be granted without good reason. It is a reward that should be given only for worthy achievements, for the achievements of genius. The history of this test has been the unfolding of an effort to define this achievement, the true inventive act, as a certain kind of mental process.\(^3\) One inevitable result of this approach has been the economically absurd conclusion that organized, plodding, group research does not produce patentable discoveries because a group does not have genius.\(^5\) Section 103 of the 1952 Act provides that "pat-
entability shall not be negatived by the manner in which the invention was made," thereby eliminating the test of "genius" from the patent law.  

C. THE NON-OBSERVABLENESS TEST

The non-obviousness test shares the economic premises of both the novelty and genius tests. With the novelty test it shares the premise that innovation should be encouraged. With the genius test it shares the premise that patent monopolies represent a substantial cost to the consumer. These two premises are accommodated by the basic principle on which the non-obviousness test is based: a patent should not be granted for an innovation unless the innovation would have been unlikely to have been developed absent the prospect of a patent. Unlike the novelty test, it does not view the inducement of investment in production and marketing facilities, after the innovation has been developed, as an appropriate function of the patent system. These are costs that must be borne by everyone who wishes to market the innovation and if, in the face of competition, investors do not find the innovation an attractive prospect, that is because there are better uses for their capital elsewhere, not because the competitive situation should be altered. The non-obviousness test makes an effort, necessarily an awkward one, to sort out those innovations that would not be developed absent a patent system. Through the years the test has been variously phrased, but the focus has always been on the question whether the innovation could have been achieved by one of ordinary skill in the art, or whether its achievement is of a greater degree of difficulty.

If an innovator must bear costs that need not be borne equally by his competitors (because they will have the advantage of his work) and that he cannot recoup, he will not make the expenditures to innovate. But in a competitive system some non-recurring costs

level of industrial art until discoveries by ordinary skilled men, which would have seemed miraculous in the last century, are definitely predictable if money is available for organized research." 145 F.2d at 30. But why will the money be expended if it cannot be recovered by means of a patent monopoly?


37 In response to the suggestion of the amicus curiae brief of the State Bar of Texas, the Court expressly noted the demise of the "flash of genius" test in Deere. 383 U.S. at 15.
can be recouped because the innovator has the advantage of the lead
time inherent in his position. Even in the case of products that can
be easily imitated the innovator has the advantage of the good will
and additional experience inherent in the position of being first in
the field. The argument that the innovator can reasonably expect
to recoup his costs simply by being first has been seriously offered
as an argument against any patent system at all.38 The difficulty is
that as a matter of empirical fact it is not known to what extent
the position of innovator gives one an advantage in a competitive
situation, nor is it possible to determine the magnitude of a particular
innovator’s costs to determine whether he can recoup them without
an exclusive grant. But what the economic argument does under-
line is that much innovation will occur in a competitive system
with no patent rights. Only the costlier kinds of innovation will
be retarded by the absence of patents. That these innovations will
probably be the socially and economically more important only
underlines the importance of the patent system. But the central
point is that not every innovation needs the patent system to induce
its appearance. In fact in many cases, the desire to obtain a superior
competitive position by being known as “advanced” and first on
the market will induce the appearance of the new product or
process. An innovation obvious to one of ordinary skill in the
art may indeed be new, in the sense that it did not exist before,
and the costs may indeed be substantial if it takes a long time to
perfect. But it is the implied judgment of the test that the cost
of innovation of this order of difficulty can probably be recouped
in a competitive situation while the costs of innovation of a greater
difficulty cannot.

The argument has to be made somewhat differently in relation
to processes that can be commercially exploited in secrecy. Innova-
tions in this area would occur absent the patent system so long
as there was reasonable assurance that the techniques involved
could be kept secret. Here the function of the patent system is to
induce disclosure of innovations that would otherwise be kept
secret. This is desirable, not only because at the expiration of the
patent the innovation becomes freely available, but also because
during the period of the patent the nature of the innovation is dis-

38 Plant, The Economic Theory concerning Patents for Inventions, Economica
No. 1, 30, 43-44 (1934).
closed on the public record, and this knowledge may make it possible for others to make further innovations in the same or related fields. But since the patent grant is not to be given lightly, it should be given only to obtain the disclosure of innovations that would otherwise be unlikely to become known. If one of ordinary skill in the art could develop the innovation, it is likely to become known with reasonable ease. Only the non-obvious innovation has any prospect of remaining secret for long and therefore justifies the award of a patent to induce its disclosure.

II. The History

These three tests, then, are the components of the history of the idea of invention in the patent law. But for the first eighty-five years there was one basic test, the test of novelty. The Act of 1793 provided that a patent should issue for the invention of any "machine, manufacture, or composition of matter" which was "new and useful."\(^{39}\) (The earlier Act of 1790 had provided that a patent should issue if the invention was "sufficiently useful and important."\(^{40}\) It has no significance in the history of the requirement of patentability.) The text of the Act of 1793 makes it clear that new as used in the Act means new and no more. But the drafters felt constrained to add that "simply changing the form or the proportions of any machine, or composition of matter, in any degree, shall not be deemed a discovery."\(^{41}\)

For the next eighty-two years American patent law followed the process of working out rules designed to prevent trivial advances from falling within the concept of patentable novelty. The problem was to distinguish between changes that were merely changes of form and changes that were changes of substance. "The sufficiency of the invention," Phillips wrote in 1837, "depends not upon the labor, skill, study, or expense applied or bestowed upon it, but upon its being diverse and distinguishable from what

\(^{39}\) 1 Stat. 318–19 (1793).

\(^{40}\) 1 Stat. 110 (1790). Section 7 of the 1836 Act, 5 Stat. 119–20 (1836), provided that "if the Commissioner shall deem it to be sufficiently useful and important, it shall be his duty to issue a patent therefor," but the courts never treated this language as legally significant. This provision was continued in § 31 of the 1870 Act, 16 Stat. 202 (1870), but it has no counterpart in the present law.

\(^{41}\) 1 Stat. at 321.
is familiar and well known, and also substantially and materially, not slightly and trivially so. This requisite of an invention is sometimes expressed to be a difference in principle." These distinctions have the ring of metaphysical debate and indeed the efforts of the courts to distinguish between the new and the really new were to lead them to distinctions that sound metaphysical and were meaningless. To quote Justice Story, "The doctrine of patents may truly be said to constitute the metaphysics of law."

The pressures that led to this line of development are not difficult to identify. On the one hand, the courts were bound by the conceptual framework of a statute whose only requirement was that the invention be "new." On the other hand, they were confronted by a quickening pace of technological advance, particularly after the Civil War, that threatened to bring every commodity within a private patent grant. This pressure was revealed and its consequences described in an 1826 opinion:

The most frivolous and useless alterations in articles in common use are denominated improvements, and made pretexts for increasing their prices, while all complaint and remonstrance are effectually resisted by an exhibition of the great seal. Implements and utensils, as old as the civilization of man, are daily, by means of some ingenious artifice, converted into subjects for patents. If they have usually been made straight, some man of genius will have them made crooked, and, in the phraseology of the privileged order, will swear out a patent. If, from time immemorial, their form has been circular, some distinguished artisan will make them triangular, and he will swear out a patent, relying upon combinations among themselves, and that love of novelty which pervades the human race, and is the besetting sin of our own people, to exclude the old and introduce the new article into use, with an enhanced price for the pretended improvement. More than three thousand patents have been granted since the year 1790. The number obtained for the same or similar objects is well worthy of observation. Eighty are for improvements on the steam engine and on steam boats; more than a hundred for different modes of manufacturing nails; from sixty to seventy for washing machines; from forty to fifty for threshing machines; sixty for pumps; fifty for churns; and a still greater number for stoves. The demand for

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42 Phillips, op. cit. supra note 29, at 127.
this article has called forth much ingenuity and competition. There are now not less than sixty patents for stoves, pretended to be constructed upon different principles. Some are patented, as it is called, because they have ten plates; some, because they have eleven; some because the smoke is permitted to escape at one side, and some because it is let out at the other. Some indefatigable projectors have contrived them with a door on each side, and others, still more acute and profound, make them with a door on one side. . . . The contribution levied upon the community, in the sale of these articles, is enormous, and would be sufficient to satisfy the most inordinate avarice, if it were not distributed among so many men of merit.

The point thus made by Judge Van Ness is that as the pace of obsolescence in a society quickens, the standard of invention must be raised lest every common product be the subject of a patent monopoly. Thus it was logical for Judge Van Ness to raise the specter of no "barriers against the growth and introduction of all the evils that distinguished the ancient system of monopolies," when "all trade and commerce, whether foreign or domestic, was appropriated by monopolists."45 Much of Judge Van Ness's complaint was directed to the absence of an examination system under the statute of 1793, a complaint to which Congress finally responded in 1836. But a necessary implication of his remarks is that the substantive law should be more demanding. For at least some of his parade of horribles, such as changes in the chimneys of stoves, were properly patentable under the law of his own day.

The central influence on the development of the law of inventive novelty was nascent American legal scholarship. By the year 1850, American patent law had been the subject of three different treatises: Fessenden,46 Phillips,47 and Curtis.48 No other area received so much special attention, and the tradition of ponderous treatises on patent law extended into the first decade of this century before finally expiring.49 Reasons readily suggest themselves. First, patent

45 Id. at 1042.
46 FESSERTEN, AN ESSAY ON THE LAW OF PATENTS FOR NEW INVENTIONS (1810) (2d ed. 1822).
47 PHILLIPS, op. cit. supra note 29.
49 The "death bed" efforts seem to be MACOMBER, THE FIXED LAW OF PATENTS (1909), and ROGERS, THE LAW OF PATENTS (1914).
law, designed to induce technological innovation, had great appeal to scholars of a young country that prided itself on modernity and progress. Second, systematic English concern with the problem was relatively recent,\(^{50}\) and thus the Americans were less likely to be overawed in this area. Third, American patent law was a creature of statute and English cases could be dismissed as irrelevant.\(^{51}\) Fessenden, Phillips, and Curtis—together with the omniscient and omnipresent Story on circuit—laid the foundations.

Viewing the complexities of patent law from the perspective of the 1960's, it is difficult to return to the spirit of the law of the first half of the nineteenth century. The pace of technological innovation was slower and the pressure of commercial activity less constant. The first relevant reported decision indicates the difference. The case is *Park v. Little*,\(^ {52}\) decided by Justice Bushrod Washington on circuit in 1813. The plaintiff complained of an infringement of his patent. The plaintiff, Park, a member of a company of volunteer firemen in Philadelphia, was an enterprising fellow who undertook to improve the efficiency of his comrades. Many of the fires that were the objects of the regular ministrations of this company occurred at night. The custom was that when the cry of fire was raised, the engine would proceed directly to the scene. It was the duty of the members of the company to leave their homes and join the engine there. But this could be the occasion of delay, for the members of the company might become confused and, hearing the sound of another engine, join up with the wrong company. Park undertook to remedy this situation by placing a bell on the engine. But it was not an ordinary bell. He mounted the bell on the end of a horizontal arm attached to the top of a flexible upright. On top of the upright was a ball weighing four or five pounds. As the horses pulled the engine through the streets, this arrangement would become agitated and the bell would ring. The device was a great success until the defendants, members of another company, copied the idea—they varied the details—and

\(^{50}\) The first systematic English treatment of patent law appears to be RANKIN, AN ANALYSIS OF THE LAW OF PATENTS (1824).

\(^{51}\) But see FESSENDEN, op. cit. supra note 46, at 41–42. That English decisions under the Statute of Monopolies would be consulted was established in Pennock v. Dialogue, 2 Pet. 1 (1829).

set a similar bell upon their engine. This caused no end of con-
fusion to the members of the complainant's company, who could
never be sure that they were pursuing the sound of their own bell
rather than that of the interlopers. Park brought his patent to court
to eliminate this difficulty. "Whether this is a new and a useful in-
vention, you must decide," Justice Washington instructed the
jury. "But the question is not, whether bells to give alarm or notice
are new, but whether the use and application of them to fire en-
gines, to be rung, not by manual action, but by the motion of the
carriage, for the purpose of alarm or notice, is a new invention, or
improvement of an old one? The power of steam is not new, and
yet its application for propelling boats would be considered as
such."53 The jury, displaying more wisdom than fidelity to these
instructions, found for the defendant.

The principles were equally clear for Justice Story. In Earle
v. Sawyer54 the jury had found against the defendant for infringe-
ment and awarded $300 damages. The defendant moved for a
new trial, contending that the plaintiff's patent was invalid. The
patent related to a device known as a shingle mill, apparently an
apparatus for cutting lumber into shingles. The particular patent,
issued in 1822, was an improvement on an earlier patent issued to
the plaintiff in 1813. The improvement of the first machine over
the second was "to admit the use and application in said machine
of the circular saw, instead of the perpendicular saw heretofore
used, and the substitution of such other parts as are rendered neces-
sary by these alterations."55 The defendant's counsel argued in
prescient terms that the patent was invalid:56

It is not sufficient, that a thing is new and useful, to entitle the
author of it to a patent. He must do more. He must find out
by mental labor and intellectual creation. If the result of acci-
dent, it must be what would not occur to all persons skilled in
the art, who wished to produce the same result. There must be
some addition to the common stock of knowledge, and not
merely the first use of what was known before. The patent act
gives a reward for the communication of that, which might be
otherwise withheld. An invention is the finding out by some
effort of the understanding. The mere putting of two things
together, although never done before, is no invention.

53 Id. at 1108. 55 Id. at 254.
54 8 Fed. Cas. 254 (No. 4,247) (C.C. D. Mass. 1825). 56 Id. at 255.
Story's answer was unequivocal. "It . . . does not appear to me now, that this mode of reasoning upon the metaphysical nature, or the abstract definition of an invention, can justly be applied to cases under the patent act."57 And he added, "It is of no consequence, whether the thing be simple or complicated; whether it be by accident, or by long, laborious thought, or by an instantaneous flash of mind, that it is first done. The law looks to the fact, and not to the process by which it is accomplished."58 It must be new, and it must be useful, and that is all.

But Earle v. Sawyer is not evidence that the judges were not capable of using the test of inventive novelty to strike down patents. Earle v. Sawyer was an unusual case on its facts. The patent claimed exactly what was concededly new, and no more. But if the patent claimed more than the inventor's exact contribution, which was usually the case, the patentee faced a more exacting standard. Thus, in the case of Woodcock v. Parker,59 involving a patent on a machine for splitting leather, Justice Story instructed the jury that:60

[I]f the machine, for which the plaintiff obtained a patent, substantially existed before, and the plaintiff made an improvement only therein, he is entitled to a patent for such improvement only, and not for the whole machine; and under such circumstances, as this present patent is admitted to comprehend the whole machine, it is too broad, and therefore void . . . . If he claim a patent for a whole machine, it must in substance be a new machine; that is, it must be a new mode, method or application of mechanism, to produce some new effect, or to produce an old effect in a new way.

Justice Story groped for words and the test of invention was born. "A new mode, method or application of mechanism, to produce some new effect, or to produce an old effect in a new way." In 1818, the judges began to speak of changes in principle, as opposed to changes in form.61 "The question for your determination,"

Washington explained, is "whether it is an improvement on the principle [of the prior art] . . . or whether it is merely a change in the form, or proportions." But although the concept of a "principle" was later to be the subject of learned exposition, the courts first used it as a shorthand way of stating Justice Story's earlier instruction. The issue of novelty, said Story, "in the present improved state of mechanics, . . . is often a point of intrinsic difficulty."

This remained the law of invention until 1875, so far as the Supreme Court Justices were concerned. *Hotchkiss v. Greenwood*, decided in the 1850 Term, can be understood only against this background. For an examination of that opinion reveals that despite all the significance that has been attributed to it, it merely reaffirmed the law as it then existed, adding only a minor wrinkle that in context liberalized the standard of invention still further. This addition, the non-obviousness test, was understood as a specialized doctrine applicable in a narrow situation, and it was only later that the case became a "leading" case.

The patent in the *Hotchkiss* case was for an improved method of making knobs for "locks, doors, cabinet furniture, and for all other purposes for which wood and metal or other material knobs are used." "This improvement consists," explained the specifications of the patent, "in making said knobs of potter's clay, such as is used in any species of pottery; also of porcelain." The key passage in the specifications stated:

[T]he modes of fitting them for their application to doors, locks, furniture, and other uses will be as various as the uses to which they may be applied, but chiefly predicated on one principle, that of having the cavity in which the screw or shank is inserted, by which they are fastened, largest at the bottom of its depth, in form of a dovetail, and a screw formed therein by pouring in metal in a fused state.

The evidence at trial developed two important facts. First, the defendant was unable to adduce any evidence that knobs of clay had ever been made before. Second, it had been common to fasten

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62 19 Fed. Cas. at 390.
64 11 How. 248 (1850).
65 Id. at 249.
66 Ibid.
67 Ibid.
knobs made of other materials to their spindles by means of the dovetail fastening described in the plaintiff’s specifications. The significance of these uncontroverted facts was the legal issue of the case.

The plaintiff had requested an instruction that the patent was valid “if such shank and spindle had never before been attached in this mode to a knob of potter’s clay, and it required skill and invention to attach the same to a knob of this description, so that they would be firmly united, and make a strong and substantial article, and which, when thus made, would become an article much better and cheaper than the knobs made of metal or other materials.” This was in substance a request for a directed verdict for the plaintiff, for as the trial court correctly observed, “it requires skill and thought to attach a spindle to any kind of knob.” Indeed, it requires skill and thought to do any kind of mechanical work. The trial court rejected the instruction because it failed to take account of the requirement that the knob, to be patentable, must embody a new principle. And, insisted the trial court, improved quality and economy did not mean that the article embodied a new principle. (This was an issue that was still agitating the courts of appeals in the Deere case and that provoked a dissent from Justice Woodbury in Hotchkiss.) The trial court took the position that if the material was old and the mode of fastening the material to the spindle was old, there was no new principle in the operation of the knob and gave the jury an instruction that amounted to a directed verdict for the defendant. The patent was therefore void, added the court, because the material was in common use, and no other ingenuity or skill was necessary to construct the knob than that of an ordinary mechanic acquainted with the business. This implied that a patent might still be valid even if it did not embody a new principle if it required more than mechanical skill for its development. But what is more important, it took the issue away from the jury and held that the knobs had not required more than mechanical skill for their construction. The jury had no choice but to find for the defendant.

In his argument before the Supreme Court, this was the point the defendant raised. The lower court had taken “upon themselves

68 Id. at 263–64.
69 12 Fed. Cas. 551, 552 (No. 6,718) (C.C. D. Ohio 1848).
70 Id. at 553.
to determine in the negative the question whether 'it required skill and thought and invention to attach the knob of clay to the metal shank and spindle, so that they would unite firmly, and make a solid, substantial article of manufacture,' instead of submitting it to the jury. It was a question of fact . . . depending upon evidence, and ought to have been submitted to the jury." The argument fell on unsympathetic ears, for in his opinion Justice Nelson misunderstood the instruction as having put to the jury the issue whether the construction of the device had required more than mechanical skill, and the dissent accepted this interpretation. It is important to note, however, that in his argument plaintiff continued to insist on the language of his requested instruction. "Skill, thought and invention," under the principle of *ejusdem generis,* seems to mean that invention is simply the exercise of skill and thought. One possible interpretation of Justice Nelson's opinion is that he understood the objection to the instructions to be that a requirement of "more than mechanical skill" was too severe and he simply rejected that ground. For it could have been argued under the law prior to *Hotchkiss v. Greenwood* that if an innovation did not incorporate a new principle it was not patentable, even if the innovation required more than mechanical skill, because it would still not be new.

The invasion of the competence of the jury was not, however, the principal argument of the plaintiff. He quoted Curtis: "The mere substitution of one metal for another in a particular manufacture might be the subject of a patent, if the new article were better, more useful, or cheaper than the old." Clay and porcelain knobs, he argued, were better than the earlier knobs of wood and metal:

It is indeed an invention of much more than common importance and merit. It is the combination of two materials, metal and earth, never before united in this manner, so as to give to the new manufacture the strength of iron with the durability and beauty of the clay or porcelain; its exemption from the corrosive action of acids and other chemical agents, and its consequent freedom from tarnish.

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71 11 How. at 253.

72 Id. at 255, quoting Curtis, op. cit. supra note 48, at 27.

73 Id. at 257.
The defendant based his argument on two alternative constructions of the patent. "Does the patent . . . confine its claim to a mere right to use clay or porcelain for the purpose of making . . . knobs, or does it claim to cover the manufacturing [of] knobs of clay and porcelain in the manner . . . set forth in the specification?" He argued for the latter construction. He favored this construction because if the patent covered knobs of clay attached to spindles by means of the dovetail fastening, then the patent covered both old and new matter. He, too, relied on Curtis: "[I]f it turns out that any thing claimed is not new, the patent is void, however small or unimportant such asserted invention may be." This had the ironic result of making the narrower construction of the claim the invalid one. If the patent covered all clay knobs, it might be valid; if it covered only clay knobs of this type, it might be invalid. The argument, however, was a literal application of the controlling law.

The case was more difficult for the defendant if the patent was construed as simply claiming knobs of clay and porcelain. His argument on this contingency required a creative analogy. A number of earlier circuit court decisions had decided that a new use for an old machine did not entitle one to a patent for the machine, since the machine, after all, was not new. Clay and porcelain, the defendant pointed out, were old materials and the patent was simply for a new use of an old material. Therefore it was not new, and not patentable.

Writing for the Court, Justice Nelson first answered the plaintiff's contention that the knobs were patentable because they were better. That they are better "is doubtless true," he said, "but the peculiar effect . . . is not distinguishable from that which would exist in the case of the wood knob, or one of bone or ivory, or of other materials that might be mentioned." Justice Woodbury, citing Earle v. Sawyer, dissented on this point. For an article that is better, he reasoned, must surely be new.

Nelson went on in his opinion to admit of an exception. The knob might be patentable, even though there was no new principle or effect, if "more ingenuity and skill in applying the old method
of fastening the shank and the knob were required in the application of it to the clay or porcelain knob than were possessed by an ordinary mechanic acquainted with the business. But since in this case the jury had found that no such skill was exercised, a conclusion Nelson reached because of his misunderstanding of the instruction, "there was an absence of that degree of skill and ingenuity which constitute essential elements of every invention." It was this phrase that presaged wider application of the test. For its time, the rule of *Hotchkiss v. Greenwood* was that a change of materials is not of itself patentable even if it results in an improvement, unless the application of the material to the use requires more than mechanical skill. In his 1854 edition Curtis added a special section on *Hotchkiss*. He could accommodate it without difficulty:

> [T]he end, effect, or result attained must be new; and... if the same end, effect, or result has been attained before, it is not new, and there has been no invention.... So, too the substitution of one material for another, in a particular manufacture, if the inventive faculty has not been at work, has been held by the Supreme Court of the United States not to be sufficient to support a patent.... But on the other hand, if the end, effect, or result is new, although the same means may previously have been used to produce a different effect, and for a different purpose, there may be a patent for the application of the materials to produce the new effect or result.

In 1850 Curtis' was the leading treatise on patent law. The first edition of *Treatise on the Law of Patents for Useful Inventions* had appeared the year before and, as the summary of the arguments of counsel in *Hotchkiss* makes clear, it was already regarded as authoritative. It was shortly completely to supersede an older and better work: Phillips' *Treatise* of 1837. Phillips' was a fine and careful book. Fessenden's, which preceded it, was largely a collection of cases followed by a sketchy and badly organized "synthetical view of the Law of Patents for New Inventions, together with such rules as may appear best calculated to prevent, as far as possible, future disputes on the subject." Phillips was

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80 Id. at 266.
81 Ibid.
82 Curtis, op. cit. supra note 48, at 45-49 (2d ed.).
83 Phillips, op. cit. supra note 29.
84 Fessenden, op cit. supra note 46, at 186-89 (1st ed.); 362-89 (2d ed.).
the first to pursue the implications of the general approach adopted by the courts. The general problem was: when is a patent covering a change that is not entirely new valid? Since every innovation will build on existing technology, this is a question that must be answered in relation to every patent. The general answer preferred was that the innovation is patentable if it is an application of a new principle or if it produces a new effect or result. Phillips began to divide this general problem into subcategories. These were: improvement; new use; combination; and change of form, proportions, or materials. By dealing separately with the different classes of innovation, Phillips hoped to add precision to the application of the ambiguous generality of the controlling rule. But he was aware that the categories were treacherous:

[W]e are without the usual help to satisfactory speculation, that is, clear language, intelligible to every one, which proves, in this, as in other cases, a double hindrance, first to clear and discriminative thinking, and second, to the ready and perspicuous communication of thought. As the different expressions used in describing patentable subjects are very analogous to each other in signification, and are mutually blended and implicated together in their meaning, and in the application made of them in the cases, the most convenient mode of treating of them, at least the most concise, will be to enumerate them all, and examine them successively.

If later writers had remained as sensitive to these difficulties, perhaps these categories would not have been raised to the dogmas they have become. But Phillips had one basic limitation. He saw himself as expositor of the law, not as commentator on it. The categories were useful, not for analytic purposes, but in order to set out the law with greater precision.

Of the four categories, improvement was the most general. On this Phillips said that either a new effect or a new method of obtaining an old effect was patentable. But what of an improvement which applies known apparatus to achieve a new effect? Not patentable said Phillips: "There is no instance in which it has been held that a mere new effect of the use of a machine already known, without any new combination, machinery, or process, is the subject of a valid patent." But what of the problem of combinations?

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85 Phillips, op. cit. supra note 29, at 77.
86 Id. at 122–23.
87 Id. at 109.
"It is sufficient . . . that the combination is new, though the separate things combined may have been before in use and well known." But then is a change of materials patentable? For a change of materials, after all, is a combination of an old device with a different material. "The substitution of one material for another is not, at least ordinarily, an invention for which a patent can be claimed." The upshot of these inconsistencies was that it made a great deal of difference under which category an innovation was subsumed. The argument in Hotchkiss v. Greenwood was an argument for competing categories. "Our invention," argued the plaintiff, "is a combination of dissimilar materials." "[W]e maintain," responded the defendant, "that they cannot obtain a patent for a new use, or double use, of the article of clay."

In 1849, Curtis did not give these categories the same prominence. He re-emphasized the general rule that the "line of demarkation between invention and a mere application to a new use" is "that the end, effect, or result attained must be new" and, unlike Phillips, he seemed to assume that this rule applied to combinations as much as to any other kind of innovation. But after Phillips the important thing is that the conceptual structure he created began to dominate the cases.

Cases before the Supreme Court raising issues of patentable novelty after Hotchkiss were infrequent. The small number, a characteristic of the entire period from 1793 to 1870, certainly cannot be explained by the ease with which the controlling rules could be applied. The concept of change of "principle" was ambiguous and the text writers' categories were inconsistent. The simplest explanation lies in the small number of patents issued each year prior to the Civil War. But even when computed as a percentage of the patent cases litigated, there appears to have been a marked rise in the incidence of the patentability issue after 1870. The rules as applied resulted in the validation of most patents and, except in the unusual case, the issue of patentability did not represent a fruitful avenue of attack for defendants. So long as

88 Id. at 115. 91 Id. at 261.
89 Id. at 133. 92 Curtis, op. cit. supra note 48, at 45.
90 11 How. at 256. 93 Id. at 41-44.
the controlling approach was that anything new was patentable, only the most trivial innovations would pose a serious problem. After 1836 many of these were screened out by the Patent Office examining procedure with which the Court seems to have been satisfied. "It is evident," the Court said in 1854, "that a patent . . . issued, after an inquisition of examination made by skillful and sworn public officers, appointed for the purpose of protecting the public against false claims or useless inventions, is entitled to much more respect, as evidence of novelty and utility, than those formerly issued without any such investigation." The few cases decided by the Court on the issue address themselves to the problem of working out the categories suggested by the early circuit decisions and organized by Phillips. There are so few of them that they can be catalogued.

The first case after Hotchkiss was Winans v. Denmead, a change-of-form case. The plaintiff had patented an improvement of cars for transporting coal. The Court without difficulty concluded that the car was patentable: "[B]y means of this change of form, the patentee has introduced a mode of operation not before employed in burden cars." Phillips v. Page, was both a new-use and change-of-size case. The patent was on a saw mill. The plaintiff's saw was larger than the earlier saws in use and was meant to be used on full-sized saw logs instead of small blocks. The Court said the enlargement of the machine was no ground for a patent. Using the language of the non-obviousness test, the Court observed that enlarging a machine is "done every day by the ordinary mechanic in making a working machine from the patent model." But it then concluded that novelty rather than non-obviousness was the appropriate standard by adding that "in order to reach invention," the patentee "must contrive the means of adapting the enlarged old organization to the new use." Neither a change of size nor a new use made the saw a patentable device.

The pace accelerated in 1870. Stimpson v. Woodman was an improvement case. The patent was for a machine for ornamenting leather by means of a figured roller. Previously a figured roller had been applied by hand for the same purpose, but the same

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95 Corning v. Burden, 15 How. 252, 270 (1854).
96 15 How. 329 (1854).
97 Id. at 338.
98 24 How. 164 (1861).
99 Id. at 167.
100 10 Wall. 117 (1870).
machine had existed using a smooth roller. The Court reversed the trial court for refusing to give a requested instruction that "if they should find that the form of the surface of the rollers in the plaintiff's machine is not material to the mechanical action of the roller in combination with the other devices and their arrangements, by which the roller is moved, the leather supported, and the pressure made," the patent is invalid. The Court added that the improvement "required no invention; the change with the existing knowledge in the art involved simply mechanical skill, which is not patentable." Although the approved instruction said nothing about mechanical skill, this sentence was apparently thought to justify the instruction, not to constitute an independent test of invention. *Seymour v. Osborne,* was also an improvement case and was explicit in ruling that non-obviousness did not constitute an independent ground of invalidity. "Improvements for which a patent may be granted," explained the Court, "must be new and useful, within the meaning of the patent law, or the patent will be void, but the requirement of the patent act in that respect is satisfied if the combination is new and the machine is capable of being beneficially used for the purpose for which it was designed." *Tucker v. Spalding,* held that a new use of an old device was not patentable, leaving to the jury the question whether the patented device was identical to an earlier device or not. *Hicks v. Kelsey,* held a change of materials unpatentable, and represented the first time in twenty-three years that *Hotchkiss* was cited in an opinion of the Court.

*Hailes v. Van Wormer* was a combination case in which Justice Strong pompously gave forth the doctrine of aggregation. The doctrine managed to combine the appearance of complex significance with the substance, if not the grace, of a nonsense rhyme:

\[ \text{The results must be a product of the combination, and not a mere aggregate of several results each the complete product of} \]

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101 *Id.* at 119. 104 *Id.* at 548-49. 102 *Id.* at 121. 105 *Id.* at 548-49. 103 11 Wall. 516 (1871). 106 13 Wall. 453 (1872). 107 *Hotchkiss* had been cited by Justice Campbell, dissenting, in *Winans v. Denmead*, arguing that a patent on a change of form should be held invalid as equivalent to a patent on a change of material. 15 How. at 344. 108 20 Wall. 353 (1874). 109 *Id.* at 368.
one of the combined elements. Combined results are not necessarily a novel result, nor are they an old result obtained in a new and improved manner. Merely bringing old devices into juxtaposition, and there allowing each to work out its own effect without the production of something novel, is not invention. No one by bringing together several old devices without producing a new and useful result, the joint product of the elements of the combination and something more than an aggregate of old results, can acquire a right to prevent others from using the same devices, either singly or in other combinations.

_Rubber Tip Pencil Co. v. Howard,_ 110 held invalid a patent for placing an eraser on the end of a pencil. It was a good idea, the Court conceded, but the device itself incorporated nothing new.

The 1874 Term brought a change. It was a silent change, unacknowledged by the Court. It first appeared in _Smith v. Nichols_, 111 involving a patent for an improved fabric. The Court held the patent invalid, although it conceded that the cloth was better, because the improvements were only improvements in degree. "Doing substantially the same thing in the same way by substantially the same means with better results, is not such invention as will sustain a patent." 112 This holding suggests that novelty alone is not enough but was not very different from _Hotchkiss v. Greenwood_. The Court added a phrase, however, suggestive of a new approach. "A patentable invention is a mental result." 113 For the first time the Court did not speak of an invention, a thing, which must be new and useful. Now it spoke of invention, an act, something that must be done, and implied that this too was a requirement of patentability.

Less than two months after _Nichols_, the Court decided _Collar Company v. Van Dusen_. 114 The patent was for a shirt "collar made of long-fibre paper." 115 The contribution of the patentee was to find a quality of paper suitable for making paper collars which, prior to his innovation, had always been found unsatisfactory. Collars already existed. The paper already existed. The Court might easily have disposed of the case as a change of materials case. But it did not: 116

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110 20 Wall. 498 (1874).
111 21 Wall. 112 (1875).
112 Id. at 119.
113 Id. at 118.
114 23 Wall. 530 (1875).
115 Id. at 542.
116 Id. at 563.
Articles of manufacture may be new in the commercial sense when they are not new in the sense of patent law. New articles of commerce are not patentable as new manufactures, unless it appears in the given case that the production of the new article involved the exercise of invention or discovery beyond what was necessary to construct the apparatus for its manufacture or production.

For the first time *Hotchkiss v. Greenwood* was cited as a case of general application, standing for the proposition that "nothing short of invention or discovery will support a patent." Invention became a third requirement for patentability.

This was a change of ultimate significance but of little immediate effect. The Court had recognized a new requirement, invention, but it still had no idea what it was. The Court simply fell back on older patent cases and their tests of novelty. At first, the cases experimented with language about genius and what it means to invent; only slowly does the non-obviousness test come to the forefront. Indeed, the change may have been at the time imperceptible to both the Court and its bar. Not until 1885, in *Thompson v. Boisselier*, did the Court take pains to point out that "it is not enough that a thing shall be new, in the sense that in the shape or form in which it is produced it shall not have been before known, and that it must, under the Constitution and the statute, amount to an invention or discovery."


118 See, e.g., *Densmore v. Scofield*, 102 U.S. 375, 378 (1880): "It does not appear... that there was a 'flash of thought' by which such a result... was reached, or that there was any exercise of the inventive faculty, more or less thoughtful, whereby anything entitled to the protection of a patent was produced."

119 The non-obviousness test predominated after 1880. But it never became the exclusive test.

120 The lower federal courts never recognized the *Paper Collar* case as a turning point. *Hotchkiss*, which eventually came to be cited as the leading case establishing the requirement of invention, was not even cited by the lower federal courts of general jurisdiction until 1882. *Scott v. Evans*, 11 Fed. 726, 727 (C.C. W.D. Pa. 1882). It was there cited as a change of material case. (It was cited in review of a Patent Office decision in *In re Maynard*, MacArthur's Patent Cases 536, 537-38 (C.C. Dist. Col. 1857).) It was first cited for the general proposition that "not every trifling device, nor any obvious improvement in the material already possessed is intended to be rewarded" by the patent laws, in *Leonard v. Lovell*, 29 Fed. 310, 314 (C.C. W.D. Mich. 1886).

121 114 U.S. 1, 11 (1885).
Perhaps the reference to the Constitution was felt necessary to validate the pronounced change. But, in spite of this strong position, the Court was confronted the next Term with the argument that "the statute makes novelty and utility the only tests of patentability."\(^{122}\) "It is sufficient answer to these suggestions," Justice Blatchford wrote, "to say that the questions presented are not open ones in this court."\(^{123}\)

It was fortuitous that the Court's change of position took place when it did. The 1836 statute had always been susceptible of two different readings. The statute provided that "any person or persons [who] discovered or invented any new and useful" device was eligible for a patent.\(^{124}\) The problem was how to read "discovered or invented." Was it the equivalent of "found," if what is found is "new and useful?" Or did "discovered or invented" connote some additional requirement? The original interpretation posited two requirements for patentability: novelty and utility. The new reading posited three: novelty, utility, and invention. As early as 1856, a district judge had read the statute in the second way, instructing a jury that "it is required that there should be an invention, that the invention should be new, and that it should be useful. In other words, before a patent can be issued, the thing patented must appear to be of such a character, as to involve or require 'invention' for its production—require the exercise of the genius of an inventor as contradistinguished from the ordinary skill of a mechanic in construction."\(^{125}\)

A satisfactory explanation of the Court's shift can only be found in non-legal forces at work in the country after the Civil War. First and foremost is the sharp rise in the number of patents issued immediately after the cessation of hostilities. In 1860, 4,357 original patents were issued on inventions.\(^{126}\) After a decline during the war, the number jumped to 8,863 in 1866. In 1867 the number jumped again to 12,277. The number of patents issued annually

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\(^{122}\) Gardner v. Herz, 118 U.S. 180, 191 (1886).

\(^{123}\) Ibid.

\(^{124}\) § 6, 5 Stat. 117, 119 (1836). The 1793 Act had provided simply that the person must have "invented." § 1, 1 Stat. 318 (1793). The 1870 statute said "any person who has invented or discovered. . . ." § 24, 16 Stat. 198, 201 (1870).


\(^{126}\) U.S. DEPT. OF COMMERCE, OP. CIT. SUPRA note 94, at 34.
remained at about this level until 1880, when it rose to an annual level of about 20,000. This is in striking contrast to the 883 patents issued the year *Hotchkiss* was decided. This increase was reflected in a rapidly expanding volume of patent litigation before the courts. At the same time, the patent abolition controversy in England and on the Continent\(^2\) exacerbated worry about the threat of the patent system to a competitive economy. During the debate on the codification of 1870, one senator put the question "whether our whole patent system is not founded in an error" and quoted from an abolitionist a statement "that patents are injurious alike to the inventor, the public, and the manufacturer."\(^1\) Although the patent abolition position never gained substantial support in the United States, it gave impetus to the drive to limit patents. "The time is not yet ripe for the propagation of this idea [of the abolition of patents] in the United States," explained an editorial writer in the *New York Times* in 1870, but "another phase of it, which will in due time lead up to the great issue, is the tendency . . . [in official American circles] not, indeed to repress the introduction of inventions, but to confine the period and chances of their reward to narrower limits."\(^1\)\(^2\)

By the 1870's the Patent Office had lost the prestige it had once enjoyed. During the Civil War charges of misappropriation of funds had been made against the commissioner. An investigating committee of the House found no evidence of misappropriation, but ample evidence of mismanagement.\(^3\)\(^4\) During the debate on the codification of 1870 some of the speakers suggested corruption in the Patent Office,\(^5\) and a new provision was put in the patent laws to prevent employees of the office from taking a personal interest in patents issued.\(^6\)

The quickening pace of innovation also made patents seem less necessary. In 1872, an engineer and inventor suggested that the art

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\(^1\) Assorted documents related to this controversy may be found in *Recent Discussions on the Abolition of Patents for Inventions* (1869) and *2 Copyright and Patents for Inventions* (Macfie ed. 1883).

\(^2\) *Cong. Globe*, 41st Cong., 2d Sess. 4827 (1870).

\(^3\) *N.Y. Times*, March 20, 1870, p. 4, col. 4.


of inventing had advanced to the point where "bribes for discovery" were no longer necessary: 133

We no longer need the incentive of personal right in invention or demonstration to develop our arts, and the writer, from his own observation, both in England and America, finds that the better class of engineers and mechanics have come already to look with disfavor upon patents, a question of fact which will be confirmed by as many as have noticed the matter, and one that can be determined by searching the records of the patent office for the names of our best engineers.

Only once, however, did the Court take notice of all this in its opinions. In 1882 the Court observed: 134

It was never the object of . . . [the patent] laws to grant a monopoly for every trifling device, every shadow of a shade of an idea, which would naturally and spontaneously occur to any skilled mechanic or operator in the ordinary progress of manufactures. Such an indiscriminate creation of exclusive privileges tends rather to obstruct than to stimulate invention. It creates a class of speculative schemers who make it their business to watch the advancing wave of improvement, and gather its foam in the form of patented monopolies, which enable them to lay a heavy tax upon the industry of the country, without contributing anything to the real advancement of the arts. It embarrasses the honest pursuit of business with fears and apprehensions of concealed liens and unknown liabilities to lawsuits and vexatious accountings for profits made in good faith.

The story of the Court's efforts after 1874 to delimit the boundaries of the concept of invention is the story of failure. The non-obvious test predominated; yet in 1892 the Court upheld the barbed-wire patent without a mention of non-obviousness, observing tersely that "in the law of patents it is the last step that wins." 135 In the preceding Term the Court had apparently despaired of ever defining invention: 136

The truth is the word cannot be defined in such manner as to afford any substantial aid in determining whether a particular device involves an exercise of the inventive faculty or not. In a

133 Richards, Patent Invention, 63 J. FRANKLIN INST. 17, 21 (1872).
given case we may be able to say that there is present invention of a very high order. In another we can see that there is lacking that impalpable something which distinguishes invention from simple mechanical skill.

Novelty, genius, and non-obviousness are all part of the requirement. In the infamous Cuno case of 1941, Mr. Justice Douglas referred to all three in almost the same breath: [T]he new device, however useful it may be, must reveal the flash of creative genius not merely the skill of the calling. . . . Tested by that principle Mead’s device was not patentable. We cannot conclude that his skill in making this contribution reached the level of inventive genius. . . . A new application of an old device may not be patented if the “result claimed as new is the same in character as the original result. . . .”

The reason for the Court’s inability to settle on the non-obviousness test as the controlling one may be due to the fact that it was never acknowledged to be a new test, but rather a continuation of an old one always required by the statute. This myth, largely the myth of Hotchkiss v. Greenwood, meant that the Court continued to treat the earlier cases as good law, and forced the concept of non-obviousness into an unhappy marriage with a concept of novelty and its doctrines of “new principle,” “new result,” or “new function.” In one case, the Court attempted to accommodate these quite different notions by propounding a rule of evidence. “It may be laid down as a general rule, though perhaps not an invariable one, that if a new combination and arrangement of known elements produce a new and beneficial result, never attained before, it is evidence of invention.” But the irrelevance of “new result” to “non-obviousness” made this a hopeless solution. The inherent instability was only increased by the additional test of genius, and the Court’s actions became erratic and unpredictable. Ironically, in the 1940’s the inventive novelty tests, originally favorable to patents, were used by the Court to invalidate patents on substantial technical advances.

The analytic dilemma was clearly revealed in the secondary lit-

137 Cuno Eng’r Corp. v. Automatic Devices Corp., 314 U.S. 84 (1941).
138 Id. at 91.
The last quarter of the nineteenth century. In 1883, Henry Merwin attempted to resolve the problem by creating two categories. Turning to the language of the statute, he made the original observation that it did not say "invented," but "invented or discovered." For Merwin this perception put everything in place. A patent was valid if it was either invented or discovered. Some cases dealt with one category, some cases with the other. In his introductory essay he wrote that "Most patents are granted for inventions strictly." But there is another class, where "the patentee has discovered a new principle, and if he makes some practical application thereof... he may obtain a valid patent." Merwin went on to explain that in the case of a discovery "no inquiry need be made into the mental process by which a knowledge of the principle was attained. It is sufficient that the principle upon which the patent is based should be new, i.e., that it should not have been known till the patentee revealed it." This division made it possible for Merwin to accommodate the old novelty (discovery) cases with the new invention cases. Merwin lavished his warmest attention on the description of invention: "Invention is imagination; it is the very opposite of reasoning or inference; it is a single act of the mind; rather an instantaneous operation than a process. It has no stages; the essence of it is that it dispenses with them." But the discussion was a failure. And with a sigh of resignation, he admitted that his was "a distinction which has not, in terms, been taken by the courts."

A far more comprehensive work than Merwin's, a three-volume work by William C. Robinson of the Yale law faculty, appeared in 1890. Robinson did not look for an easy way out. For Robinson, it was the nature of the inventive act that would furnish "a correct and definite apprehension of the attributes which must be found in every true invention." Each inventive act consists of two ele-

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141 Merwin, The Patentability of Inventions (1883).
142 Id. at 3.
143 Ibid.
144 Ibid.
145 Id. at 22.
146 Id. at 557.
147 Robinson, The Law of Patents for Useful Inventions (1890). It was described in Davis, Proposed Modifications in the Patent System, 12 Law & Contemp. Prob. 796, 806 (1947), as "perhaps the most profound study of our patent system ever made."
148 Robinson, op. cit. supra note 147, at 115.
ments: "(1) An idea conceived by the inventor; (2) An application of that idea to the production of a practical result." This second element incorporated the traditional idea that there must be a reduction to practice. Most interesting was Robinson's definition of the necessary mental element: "an exercise of the creative faculties, generating an idea which is clearly recognized and comprehended by the inventor, and is both complete in itself and capable of application to a practical result." Thus he was able to transform the old novelty doctrine into a test of the inventive act and thereby harmonize the old cases with the new. His solution has three fundamental defects. First, it involves tests that have little relation to reality, or to the extent they are based on reality, that reality is exclusively one of mechanical improvements. Second, the tests are derived inductively from a given concept of invention without any reference to the economic functions a patent system might or should perform. And, third, it is discriminatory because it suggests that of two people who discover the same thing, only one might have invented it. Only the person who understands the "idea" is worthy of a patent. Robinson extended the metaphysics of invention begun in Story's early opinions. He was the last scholar to attempt to move directly from "invention" to a test of patentability on the basis of inductive logic. It is as if the thoroughness of his attempt proved once and for all the futility of the approach.

Walker's Text-Book of the Patent Laws, published in 1883, is much different from the works of both Merwin and Robinson. Merwin and Robinson conceived of themselves as walking among the inventors of genius they so laboriously describe. Walker, on the other hand, plods through the cases. This is both the weakness of his analysis and the source of the book's endurance for more than eighty years. Walker does not solve the analytic dilemma, he encapsulates it. And fossilized in Walker, the dilemma has been treated as the law down to the Deere decision. Walker is quick to acknowledge that "invention" is not defined. "There is no affirmative rule by which to determine the presence or absence of invention in every case."

But Walker does have something to offer: "negative rules of invention" derived from the cases in which patents have been held invalid. For the most part these are the old novelty

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140 Id. at 116.
150 Id. at 132.
151 WALKER, TEXT-BOOK OF THE PATENT LAWS 18 (1883).
tests put into the negative. For instance, Walker announces that "aggregation is not invention."\textsuperscript{152} The negative novelty tests are supplemented by a negative non-obviousness test: "It is not invention to produce a device or process which any skillful mechanic or chemist would produce whenever required."\textsuperscript{153} Commercial success is used to resolve borderline cases: "When the other facts in a case leave the question of invention in doubt, the fact that the device has gone into general use, and has displaced other devices which had previously been employed for analogous uses, is sufficient to turn the scale in favor of the existence of invention."\textsuperscript{154}

The use of the negative form was a rhetorical device that eased the tension between the old novelty tests and the new requirement of invention. When the Court said that a new result is evidence of invention, that left the basic problem what is invention if its presence can be proved by a new result. But if one says that aggregation is not invention, there is no such problem because the rule in form does not claim to say anything about what invention is. Thus Walker's contribution was to give the new requirement of invention and the old tests of novelty a framework in which they could coexist in an uneasy but apparently permanent peace. The 1937 edition,\textsuperscript{155} the sixth version of the book to appear, contains these same tests, illustrated in greater detail by cases that relied on earlier editions. And if the structure of the 1964 edition is substantially affected by the 1952 statute, the negative novelty tests are still given a prominent role,\textsuperscript{156} in spite of the fact that they find no basis in § 103.

Walker captured the inconsistencies of the law of his day as well as anyone could. But having structured the analytic dilemma, he

\textsuperscript{152} Id. at 24. \textsuperscript{154} Id. at 30.

\textsuperscript{153} Id. at 18. \textsuperscript{155} \textit{Deller}, \textit{Walker on Patents} (1937).

\textsuperscript{156} \textit{Deller}, \textit{Walker on Patents} (3d ed. 1964). The negative tests were summarized as follows: "(1) mere exercise of skill expected of a person having ordinary skill in the art; (2) substitution of materials or elements; (3) change of location, size, degree and form; (4) reversal of parts; (5) unification or multiplication of parts; (6) making old devices adjustable, durable, portable or moveable; (7) change of proportion; (8) duplication of parts; (9) omission of parts with a corresponding omission of function; (10) substitution of equivalents; (11) new use for a new and analogous purpose; (12) conversion of manual to a mechanical operation; (13) superior or excellent workmanship; and (14) aggregation." 2 id. at 75. This framework treats non-obviousness as one of many tests rather than as the controlling test of invention.
made it harder for the Court to move away from it. In 1962 Congress explicitly legislated that non-obviousness was the controlling test of invention and thus eliminated any basis for the old novelty tests. In Deere, the Court applied the non-obviousness test and rejected new result as a relevant subject for inquiry. Now that new result has fallen, all tests of invention, whether negative or affirmative, based on a test of novelty should quickly follow. Patent law has too long suffered under the confusing concepts of "combination," "aggregation," "new effect," and "new use." These tests only complicate the inquiry into non-obviousness that is required by § 103.

III. NOVELTY AND INVENTIVE NOVELTY: ADAMS

This conclusion may bury tests based on inventive novelty before their demise. Their past durability suggests that they will not fall simply on the basis of the Court's action in the Deere case. Section 101 provides that "whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title."157 This is the language of § 24 of the 1870 codification, the very language on which Walker based his negative tests. Some courts consider the inventive novelty tests to derive from § 101 rather than § 103.158

The answer to this position must be that in a statute that contains § 103, "new" in § 101 should be interpreted as it was in Earle v. Sawyer.159 The whole metaphysical apparatus that developed to distinguish the new from the trivially new would never have been necessary in a statute that contained a non-obviousness test. Now that the statute does contain such a test, the apparatus can be dispensed with and new can once again be interpreted as meaning new. The only good reason for inserting § 103 in the statute was to choose one of the three competing tests of invention. If tests implicitly rejected by § 103 are to reappear in § 101, these statutory changes will prove fruitless. Several of the nineteenth-century cases clearly imply that the Court then thought that a finding of non-

159 See text supra, at notes 54–58.
obviousness would override a finding of lack of inventive novelty.\footnote{160} This was the case in \textit{Hotchkiss} itself where Justice Nelson went on to discuss the non-obviousness issue after he had already found no new effect.

The decision of the Court in \textit{United States v. Adams}\footnote{161} can be read, if with some difficulty, as confronting this issue. The record in \textit{Adams} made the non-obviousness issue a simple one. In 1939 Adams had found, after considerable experimentation, that a battery with unusual properties could be made from a positive electrode of magnesium, a negative electrode of cuprous chloride, and an electrolyte of water with a carbon catalyst. The battery was light in weight relative to its output. It could be activated in the field with impure water, even salt water. It produced a constant voltage and current throughout the period of its life. Once activated, the battery produced heat, which meant that it would continue to operate in extremely low temperatures. That a battery with these characteristics could be constructed was not suggested by anything previously known to the art. In fact, the scientists of the Army Signal Corps whom Adams tried to interest in his discovery at first thought it was not workable. Adams' battery was clearly non-obvious.

The Government, defendant in the infringement action in the Court of Claims, nevertheless argued for the invalidity of the patent. Not because anything in the prior art suggested that a battery with these characteristics could be built. But because the prior art suggested that a battery made of these materials was not new. The Government's brief spelled this out:\footnote{162}

\begin{quote}
\textit{[I]f, as we submit, the combination of magnesium and cuprous chloride in the Adams battery was not patentable because it represented either no change or an insignificant change as compared to prior battery designs, the fact that, wholly unexpectedly, the battery showed certain valuable operating advantages over other batteries would certainly not justify a patent on the essentially old formula.}
\end{quote}

\footnotetext{160}{E.g., Ansonia Brass & Copper Co. v. Electrical Supply Co., 144 U.S. 11, 18 (1892); "[I]f an old device or process be put to a new use which is not analogous to the old one, and the adaption of such process to the new use is of such a character as to require the exercise of inventive skill to produce it, such new use will not be denied the merit of patentability."}

\footnotetext{161}{383 U.S. 39 (1966).}

\footnotetext{162}{Brief for the United States, pp. 21-22.}
Although the Government did not cite it, the strongest case in support of the Government position was General Electric Co. v. Jewel Incandescent Lamp Co. The Court in that case held a patent for an inside-frosted light bulb invalid. Earlier frosted light bulbs had either been frosted on the outside so that dirt collected in the crevices or on the inside which made them weak and easily broken. The patent in issue taught that if a bulb was frosted on the inside twice, the second etching treatment would increase the strength of the bulb because the angular crevices formed by the first frosting would be smoothed into saucer-shaped pits. Before this discovery, it was not known that a second treatment would strengthen the bulb, and the Court practically conceded that this characteristic was non-obvious. But the Court held the patent invalid on grounds of lack of novelty even though theretofore "electric bulbs had [not] been frosted on the interior with rounded rather than sharp angular crevices or pits." The Court's reason was that the prior art revealed both the inside-frosted bulb and that double etching would affect the surface of the glass, although for decorative and light-diffusing purposes, not for strengthening purposes. A patent is invalid when "the prior art discloses the method of making an article having the characteristics of the patented product, though all the advantageous properties of the product had not been fully appreciated."

The facts in the Adams case could easily have brought the patent within this rule. Not only would an elementary table of electrochemical characteristics have suggested a battery of magnesium and cuprous chloride, but a British patent of 1880 showed a battery with magnesium and cuprous chloride electrodes in a liquid electrolyte. The chief difference between the two batteries seems to be that the British patent showed the carbon in the cuprous chloride

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163 The Government placed its chief reliance on Sinclair & Carroll Corp. v. Interchemical Co., 325 U.S. 327 (1945). That case held a patent on a printing ink invalid. The ink was developed through the use of solvents whose relevant characteristics could be obtained from the manufacturer's catalogue. Thus, unlike the battery in Adams, the properties of the ink were obvious to one skilled in the art. The Court distinguished the case on this ground. But it also said that "here [unlike Sinclair] ... the Adams battery is shown to embrace elements having an interdependent functional relationship." 383 U.S. at 50. This language suggests that the Court was using the doctrine of aggregation to distinguish the cases, although one would have thought that the solvents in Sinclair also had such a relationship with the ink.

164 326 U.S. 242 (1945).

165 Id. at 248.

166 Ibid.
electrode rather than in the electrolyte. It was perfectly possible for the Court again to hold that lack of inventive novelty made the patent invalid even in the face of non-obviousness.

The Court did not do so. It found the patent valid. But not on the ground that simple novelty was enough. The Court dismissed the British patent on the ground that it had been shown to be inoperable, although there was no explanation of why the British patent was inoperable and the Adams patent highly useful. And it dismissed the contention that the Adams discovery simply involved the substitution of known electrochemical equivalents, and therefore was not new, on the ground that its characteristics were wholly unexpected. This seems to be the Court’s way of saying that simple novelty is enough where non-obviousness is present. The Adams decision can and should be read as overruling the General Electric Co. case and holding that simple novelty is enough under § 101. If it is so read, the inventive novelty tests have no place under either § 101 or § 103.

IV. COMMERCIAL SUCCESS: THE COOK CASES

The elimination of the inventive novelty tests cannot be effected by a simple declaration. Tests based on inventive novelty so permeate the patent cases that it is necessary to analyze each test in terms of its relation to non-obviousness. That much work remains to be done was revealed in the Cook Chemical Co.\textsuperscript{167} cases, which turned on the role to be assigned to commercial success and long-felt need in a determination of non-obviousness. The patent was for a hold-down cap on the pump-type sprayers so familiar to every American housewife. Before the development of the patented cap, it had been necessary to distribute the fluids in bottles with regular caps and the sprayer separately attached to the package. After purchase, the customer had to remove the cap and put the sprayer on the bottle. The sprayer, thus exposed, was subject to loss and breakage. The patented cap holds the pump in retracted position and provides a seal effective against even low viscosity insecticides, making it possible to ship the fluids with the sprayer on the bottle forming a compact, break-resistant unit. The cap is, as the description should indicate, a simple device. The district

court found it patentable on the basis of evidence that for at least five years the industry had been aware of the need for a sprayer that could be shipped on the bottle and that once the patented device was developed, it was a commercial success. Citing the Barbed Wire Patent case, the court concluded that "the last step is the one that wins and he who takes it when others could not, is entitled to patent protection." The Court of Appeals affirmed, observing that "instantaneous industry, as well as public acceptance of the device in issue, confirms our belief invention was produced."

The Supreme Court held the patent invalid, answering that in this case factors such as commercial success and long-felt need did not "tip the scales of patentability." The Court added, however, that "such inquiries may lend a helping hand to the judiciary which, as Mr. Justice Frankfurter observed, is most ill-fitted to discharge the technological duties cast upon it by patent legislation. . . . They may also serve to 'guard against slipping into hindsight,' . . . and to resist the temptation to read into the prior art the teachings of the invention in issue." The effect of this language is to leave commercial success the role it has traditionally enjoyed. Even when rejecting commercial success in a particular case, the Court has almost always conceded that "commercial success may be decisive where invention is in doubt."

But how is commercial success relevant to non-obviousness? The argument for commercial success is set out in a law review comment cited with apparent approval by the Court in Cook:

The possibility of market success attendant upon the solution of an existing problem may induce innovators to attempt a solution. If in fact a product attains a high degree of commercial success, there is a basis for inferring that such attempts have been made and have failed. Thus the rationale is similar to that

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169 336 F.2d 110, 114 (8th Cir. 1964). 170 383 U.S. at 36.
of longfelt demand and is for the same reasons a legitimate test of invention.

This argument involves four inferences. First, that the commercial success is due to the innovation. Second, that if an improvement has in fact become commercially successful, it is likely that this potential commercial success was perceived before its development. Third, the potential commercial success having been perceived, it is likely that efforts were made to develop the improvement. Fourth, the efforts having been made by men of skill in the art, they failed because the patentee was the first to reduce his development to practice. Since men of skill in the art tried but failed, the improvement is clearly non-obvious.

Each inference is weak. The commercial success might not be due to the innovation but rather, as the petitioners in Cook argued, to "sales promotion ability, manufacturing technique, ready access to markets, consumer appeal design factors, and advertising budget." But given the commercial success of the innovation, why is it likely that the commercial potential was perceived in advance? And why is it likely that because the commercial potential was perceived, men of skill began to work on the problems of that innovation as opposed to other potential improvements? And if men of skill start to work on the improvement, why does the fact that the patentee was first to perfect the improvement mean the others failed? Perhaps they were only a little slower. This seems a fragile thread on which to hang a conclusion of non-obviousness, particularly in a case where the patentee shows only commercial success but does not show that the commercial potential was perceived or that attempts actually were made that failed. How, then, does commercial success constitute a helping hand? The Court said that "these legal inferences or subtests do focus attention on economic and motivational rather than technical issues and are, therefore, more susceptible of judicial treatment than are the highly technical facts often present in patent litigation." Perhaps commercial success is a familiar distraction for judges confused by the facts.

It is not difficult to see why lawyers for patent owners are eager to introduce evidence of commercial success. By introducing evidence of commercial success the lawyer is telling the judge that his client's patent is very valuable and that if the judge holds the patent...
invalid he is destroying expectations of great value. This is not an argument without persuasiveness. The Supreme Court itself was once led to recognize an exclusive right simply because the plaintiff's right was valuable and he had created it.\textsuperscript{178} When Walker suggested to the courts that they should resolve borderline cases on the basis of commercial success, he was really saying, "Decide all of the borderline cases where the patent is worth something in favor of the patentee, decide all the other borderline cases against the patentee." Since it is unlikely that patents that are not commercially successful will be brought to litigation, this amounts to a suggestion that borderline cases be decided in favor of patentees. In fact, if one is willing to infer from the litigation itself that the patent is valuable because it is worth litigating, and that since it is valuable it must be commercially successful, one ends up with the rule that all patents that are litigated should be held valid.\textsuperscript{177} If commercial success is a relevant "economic issue," then one can argue that it should be a factor weighing against patentability in borderline cases. Commercially successful patents are the ones that truly impose a monopoly tax on the market, and therefore courts should be even more cautious in holding them valid. Furthermore, it is in the area of innovations that quickly meet consumer acceptance that the innovator has the best chance of recovering his special costs without a patent monopoly. The chances of doing this in any particular case depend, of course, on the good-will advantages of being first and the speed with which potential competitors can enter. But the more quickly a substantial market can be developed and its profit returns enjoyed, the greater (as a general rule) would seem to be the advantages accruing to the innovator who enters the market first. He will not need extensive market development that will alert potential competitors before the profits begin. Thus, in the area of the commercially successful improvement quickly recognized by the market, a patent is less likely to

\textsuperscript{178} See International News Service v. Associated Press, 248 U.S. 215 (1918). Use of commercial success as a basis for validity in patent cases reached its peak in Temco Elec. Motor Co. v. Apco Mfg. Co., 275 U.S. 319, 328 (1928), where the Court reversed a holding of invalidity because the patent's "usefulness was demonstrated by ten years' use in such large numbers and by such profitable business."  

\textsuperscript{177} Cf. Diamond Rubber Co. v. Consolidated Rubber Tire Co., 220 U.S. 428, 441 (1911): "... the utility of a device may be attested by the litigation over it, as litigation 'shows and measures the existence of the public demand for its use.'" See also Eames v. Andrews, 122 U.S. 40, 47 (1887).
be necessary to evoke the improvement. The argument assumes, of course, that the commercial potential is perceived in advance by the innovator so that it can affect his decision to develop the innovation. This is not necessarily so, but the same assumption is made by the traditional argument for commercial success as a factor favoring a finding of invention. At the very least, these two arguments should cancel each other and leave commercial success with no role to play in a non-obviousness inquiry.

Commercial success entered the picture because it was relevant to the issue of inventive novelty. If an innovation is received by the commercial community as a substantial improvement, it is hardly for the courts to hold that it is only a trivial advance. "[I]f there be anything material and new," said an often quoted English judge in 1785, "which is an improvement of the trade, that will be sufficient to support a patent." In 1849, a federal district judge explained to a jury that the higher the degree of utility, the stronger the evidence that "some new principle, or mechanical power, or mode of operation, producing a new kind of result, has been introduced." "It is said," reported Curtis, "that whenever utility is proved to exist in a very great degree a sufficiency of invention to support a patent must be presumed." The Supreme Court, citing the same authority as Curtis—an essay by an English writer—recognized the doctrine in 1877.

In Smith v. Goodyear Dental Vulcanite Co. the defendants contended that the plaintiff's patent for denture plates of hard rubber was invalid because it simply involved a change of materials. Justice Strong rejected this contention, writing of the merits of the plaintiff's teeth as if he himself had acquired a pair: "It was capable of being perfectly fitted to the roof and alveolar processes of the mouth. It was easy for the wearer, and favorable for perfect

178 This relationship was spelled out in Strobridge v. Lindsay, Sterritt & Co., 2 Fed. 692 (C.C. W.D. Pa. 1880). The case was decided at a time when the federal trial courts were still applying the test of inventive novelty alone.

179 Rex v. Arkwright, 1 Webs. Pat. Cas. 64, 71 (K.B. 1785) (Buller, J.).


181 Curtis, op. cit. supra note 48, at 37.

182 Webster, On the Subject Matter of Letters-Patent for Inventions, reprinted as an appendix to Curtis, op. cit. supra note 48, at 521 (2d ed.).

183 93 U.S. 486 (1877).
articulation. It was light and elastic, yet sufficiently strong and firm for purposes of mastication."\footnote{Id. at 494.} Observing that many thousands of "operators" were using the new improvement in preference to older devices, he concluded that "all this is sufficient . . . to justify the inference that what Cummings [the inventor] accomplished was more than substitution of one material for another; more than the exercise of mechanical judgment and taste [sic];—that it was, in truth, invention."\footnote{Id. at 495.}

Fifteen years later, the Court reversed its position and rejected commercial success: "If the generality of sales were made the test of patentability, it would result that a person by securing a patent upon some trifling variation from previously known methods might, by energy in pushing sales or by superiority in finishing or decorating his goods, drive competitors out of the market and secure a practical monopoly, without in fact having made the slightest contribution of value to the useful arts."\footnote{McClain v. Ortmayer, 141 U.S. 419, 428 (1891).} But when the Court upheld the barbed wire patent, it laid heavy emphasis on the widespread use of the improvement covered by the patent.\footnote{The Barbed Wire Patent, 143 U.S. 275, 282–84 (1892).} Although commercial success has often been rejected in particular cases, its general relevance has never again been questioned.

Like new result, commercial success passed into the potpourri of the law of invention without any attempt to relate it to non-obviousness. If the Court is going to follow the logical implications of its approach in \textit{Deere}, it will be necessary to reject commercial success as a standard, not only in particular cases but generally. It only distracts judges from the issue of validity and draws their attention to the value of the patent. Unlike actual proof of long-felt need or efforts that failed, it is not a relevant "motivational or economic" issue.

V. PROBLEMS FOR THE FUTURE: THE PRIOR ART

Should the Court be willing to pursue the implications of \textit{Deere} and focus the issue of invention on an inquiry into non-obviousness, subsidiary tests of invention unrelated to non-obviousness must be rejected. Tests so old and so familiar will not disappear
unless the Court subjects each one to the inquiry: what does this test have to do with non-obviousness?

Given the present state of the law on invention, this will constitute a substantial departure. But it is, in fact, only a beginning not an end. It should help the courts to concentrate on the resolution of the factual issues instead of relying on inherited, irrelevant doctrinal crutches. But the test of non-obviousness is not without its own difficulties. The Court said in Deere: "Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved." Although the resolution of these factual issues is often difficult, the issues themselves are reasonably clear. But underlying each of the three steps there is one central problem that has never really been faced: the meaning of the "pertinent art." This is a crucial issue because it plays a double role: it determines both the relevant prior subject matter and relevant level of skill. Nevertheless, it has barely been touched on in the cases or the secondary literature.

There are, at least, two possible approaches. One is to define the "pertinent art" as the art of the industry for which the innovation is designed. This can be called the "product-function" approach. The second is to define the "pertinent art" as the art of dealing with the kind of problem which the innovation is designed to solve. This is the "problem-solving" approach.

To illustrate. In Cook the basic, unarticulated premise of the patentee-respondent was that the relevant art was the "shipper-sprayer" industry. Since Calmar, an important member of this industry, had worked unsuccessfully for ten years to produce an integrated breakage-resistant sprayer, it was beyond argument, the patentee contended, that the development of such a successful device was non-obvious. "Either the technicians employed by Calmar to solve the problem did not possess ordinary skill in the art or the subject matter of the Scoggin patent was not obvious at the time the invention was made to persons possessing such skill." The patentee dismissed the first possibility facetiously, citing the testimony of the president that the company had "for a good many years a number of good, clever people" engaged in research

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188 383 U.S. at 17.
189 Brief for Respondent, pp. 33-34.
Indeed, this conception of the pertinent art was so narrow that he argued that a patent for a seal on a cover for a pouring spout "had nothing to do with a sprayer." 101

Colgate argued for a somewhat broader art, but gave the same kind of definition: "the art of making dispensers for liquids in containers for household use." 102 Rejecting the contention that a patent relating to a pouring spout was not pertinent art, the Court offered a definition of the pertinent art different from that advanced by either side. "The problems confronting Scoggin and the insecticide industry were not insecticide problems; they were mechanical closure problems." 103 The Court defined the pertinent art, not in terms of the industry or the type of product, but in terms of the kind of problem that the patent was designed to solve.

The product-function approach to the definition of the art is compatible with the inventive novelty test. If the issue is whether the device is new, the sensible place to look for anticipation is in the industry where it is used. It is also the implicit concept of the art that lies behind the commercial success test. If the innovation was commercially successful in the industry it must be new to the industry, and since the industry is the relevant "art" it is patentable. It is the concept of the art that lies behind the Patent Office classification system: "[T]he characteristic selected as the basis of classification is that of essential function or effect. Arts or instruments having like functions, producing like products, or achieving like effects are brought together." 104

There is a basic difficulty with the product-function approach to the definition of the art when it is used in conjunction with the non-obviousness test. It can be called the problem of the dumb art. The respondent in Cook raised this problem when he facetiously suggested that Calmar's technicians might not have possessed ordinary skill in the art. The respondent could flippantly dismiss this possibility because Calmar was such an important part of the consumer pump-sprayer industry. But suppose Calmar's technicians were in fact incompetent to develop a satisfactory breakage-resistant sprayer? Should the innovation be patentable because the industry is staffed by unskilled men? The product-function ap-

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100 Id. at 34.
101 Id. at 25.
102 Brief for Petitioner Colgate, p. 4.
103 383 U.S. at 35.
The approach would suggest that it should be. But if patents are viewed in relation to their economic function this is an unsettling result. In terms of economic purpose, the idea behind the non-obviousness test is to evaluate the magnitude of the costs involved in a given innovation. What are the costs of a development that is non-obvious only to the dumb industry? They are the costs of hiring the personnel with the skill to deal with the problems in need of solution. If the solution to the problems is indeed obvious to the person with skill in the art concerned with solving them, these costs should not be very great. A patent hardly seems necessary in order to enable the innovator to recover his costs.

A recent example of a case where the traditional approach to the definition of the pertinent art was carried to its logical extreme is *Abington Textile Machinery Works v. Carding Specialists Ltd.*[^105] The patent in suit was for an improvement in cotton-carding machinery. The improvement consisted of an addition to the machine of a pair of rollers that would crush impurities in the cotton, causing the impurities to fall out at later stages in the processing. A professor in the School of Textiles at North Carolina State College testified for the parties attacking the patent that at the time the invention was made it would have been obvious to him. The district court dismissed this testimony on the grounds the professor was a man of extraordinary skill in the art. The question, said the district court, was whether the improvement would "have been obvious in 1957 to a person having ordinary skill in the art, namely, a typical card operator in a fine cotton processing mill."[^196] Clearly, there is a great deal of difference between the "art" of the men who actually operate the machines and the "art" of the men who concern themselves with the design and effective operation of textile-processing machinery. If the "pertinent art" is the first, then the Court was clearly right in dismissing the professor's testimony. But if the art is the art of solving problems in textile processing, then perhaps the professor really was a man of ordinary skill in that art. The crucial issue in the case was whether similar crushing rollers used in different processing systems—woolen, worsted, and cotton-condenser systems—made the use of the rollers


[^196]: 249 F. Supp. at 829.
in a fine cotton-processing system obvious. The chief difference between the other uses of crushing rollers and the use in the patent in suit was that the earlier uses put the crushing rollers in place before further carding operations. The parties attacking the validity of the patent argued that “since the conventional single cylinder cotton carding machine used in fine cotton mills provides a web at only one location,” and since the crushing rollers had to be applied to a web, it was obvious to locate them where the innovation in issue did. The court dismissed this on the grounds that it was obvious only after one had decided to use crushing rollers in such a machine. The court assumed that the innovation must be obvious, not to one trying to improve cotton processing, but to the day-to-day operator of the machinery.

Defining the art in terms of the problem to be solved also has its difficulties. If the relevant art is the art of inventing, all inventions become obvious because the improvement was obvious to its inventor. This definitional quandary clearly appears in the design-patent cases. Design patents are an archaic survival of the nineteenth-century view that copyright did not provide a basis for design protection. They do, however, provide some examples of the problems of the non-obviousness test. So long as the only requirement was that the design be new, the concept of an inventive design patent was not inherently absurd. But it is impossible to apply the non-obviousness test. In desperation the courts have fallen back on distinguishing between the designs of genius and designs not of genius, which reduces to an attempt to discriminate between good art and bad art. The application of the test requires that there be a craft with norms of problem solving whose skills are reasonably widely known and which are directed to the solution of the type of problems the innovation in question is designed to solve. To advance a tentative definition of the “pertinent art,” it is the art to which one can reasonably be expected to look for a solution to the problem which the patented device attempts to solve.

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197 Id. at 834.
199 General Time Instruments Corp. v. United States Time Corp., 165 F.2d 853, 854 (2d Cir. 1948); “In short, the test is whether the design involved a step beyond the prior art requiring what is termed ‘inventive genius.’”
This is the definition of the pertinent art that the Supreme Court adopted in *Cook*.

This definition raises two issues. First, what of the device that solves no problem? Is it non-obvious? Second, what of the innovation where the solution was obvious but the existence of the problem was not?

The first difficulty is only of theoretical curiosity. And there is no need to confront this rhetorically plausible problem. The device is not patentable for lack of utility. The Court only recently reaffirmed the requirement that utility is necessary for patentability, so that every patentable device must respond, with some degree of success, to some need.

The second difficulty is an important one. The case that provides the most useful example of the problem is *Great Atlantic & Pacific Tea Co. v. Supermarket Equipment Corp.* That case turned on the validity of a patent for a counter extension and frame used to pull groceries along a checkout counter. The frame was simplicity itself, made of three pieces of wood fastened together and a handle to enable the cash register operator to pull it forward along the counter. The evidence in the record showed that the patentee, a district supervisor for a supermarket chain, had developed it in a short period of time after being confronted with the need to be able to handle more customers in one of his stores that lacked adequate space to install an additional checkout counter. The Court chose to speak in terms of inventive novelty and found the device lacked invention on the grounds that it was an aggregation that performed no new function. This conclusion was contrary to the facts. But the conclusion of the Court that the device lacked invention is nonetheless proper. Surely the device was an obvious solution to the problem of speeding up the flow of customers through the checkout lane. But the evidence also suggested that what had not been obvious to the industry was

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201 340 U.S. 147 (1950), reversing 179 F.2d 636 (6th Cir. 1950).

202 The Court did not note this fact. The Court of Appeals described the patentee as an employee “who was assigned the task of solving the problem” of speeding up the flow of customers in the checkout lane. 179 F.2d at 636. This gives the impression that the development was the result of a concerted effort to solve a perceived problem. In fact, the patentee-employee was assigned to solve the “problem” of an unhappy store manager, if necessary by the installation of an additional counter. Record, p. 55.
the problem about the rate of flow through checkout lanes, or that it might be possible to improve it. The contribution of the patentee was the recognition of the need to improve the flow and a willingness to investigate the problem. The problem was surely non-obvious to an industry that had ignored it for years. And if the problem was non-obvious, why was its solution not also non-obvious, since there can be no solution without a problem? A traditional verbal answer to this contention in patent law has been that the patent is on the solution, not the problem, and therefore the solution must contain the "invention" or the non-obvious element. But there is a serious economic argument for this position as well. The patent law is designed to induce innovations that would not otherwise appear in a competitive system. The prospect of a patent gives the innovator the assurance that if he is successful he will make profits, and this prospect of profits makes the expenditures on experimentation, whether they be expenditures of time or money or both, a reasonable investment. But before the prospect of a patent can begin to operate in this fashion, the person must have been confronted with the decision whether to innovate or not. If he has no knowledge that there is a problem to be solved, he is hardly in a position to decide whether or not to try solving it. Once he has a perception that there is a problem, no matter how general that perception may be, he is then in a position to decide whether to expend time and money to solve it. And only if he is confronted with such a decision, can the prospect of a patent have any role to play. So when an innovation results merely from the perception of a problem, rather than the working-out of a non-obvious solution, no patent should issue. That seems a sensible way to state the holding of the Supermarket Equipment Corp. case. And if that is so, the situation creates no difficulty for the tendered definition of the "pertinent art," because every patentable innovation must be responsive to a problem.

VI. THE COURT'S RESPONSIBILITY

Deere, Adams, and Cook are hopeful signs that the courts will begin to work out the implications of the non-obviousness test that have been ignored. If the courts begin to face and solve

203 Robinson stated that the idea generated by the mental part of the inventive act must be "an idea of means as distinguished from an idea of end." Robinson, op. cit. supra note 34, at 155.
these analytic issues, the administration of § 103 should be made easier. But the Supreme Court did not think the problem of § 103 was one for the courts at all. "[I]t must be remembered," said the Court, "that the primary responsibility for sifting out unpatentable material lies in the Patent Office. To wait litigation is—for all practical purposes—to debilitate the patent system. We have observed a notorious difference between the standards applied by the Patent Office and by the courts."204 Although gentler in language, this criticism of the Patent Office is in the tradition of the attack on the office made by Mr. Justice Douglas in his concurring opinion in the Supermarket Equipment Corp. case.205 This attack accuses the Patent Office of ruining the patent system because of its failure to apply the invention requirement with sufficient rigor. The problem with this statement is not that it is untrue but that it is unwise. The Court should be more sensitive to the roots of its power even in so small a matter. Can the Court seriously expect men who have dedicated themselves to the operation of the Patent Office and the patent system to respond warmly to the charge that they have debilitated the patent system? Yet the co-operation of these men is essential if there is going to be any change in Patent Office practice.

The usual complaint is that the Patent Office issues many patents that are invalid under § 103. This appears to be true, but how does it debilitate the system? The explanation offered is that each of the invalid patents issued is a "license to litigate" which can be used as a "threat" to "coerce" weaker competitors into submission. The problem is presently receiving serious attention from the Antitrust Division, which has filed a suit against the Minnesota Mining and Manufacturing Company charging abuse of patents in this manner.206 But if the patents are invalid, how are they such an effective threat? The answer is that the defense of an infringement suit, even if the patent is held invalid, is expensive and that the patentee can always offer a settlement cheaper than the litigation costs. A leading patent lawyer has estimated the costs for

204 383 U.S. at 18.

205 340 U.S. at 154.

206 United States v. Minnesota Mining & Mfg. Co., Civ. No. 66C627 (N.D. Ill. April 7, 1966). "According to the suit, the company has attempted to control the industries by systematic coercion of competitors, through suits or threatened suits for patent infringement, to accept illegal patent license agreements." 5 TRADE REG. REP. ¶ 45,066 (1966).
each side in a patent infringement suit at a minimum of $50,000. 207 Invalid patents, in the hands of unscrupulous and powerful men, are worth money. This debilitates the patent system because it makes patents the vehicles for suppression of competition rather than the reward for invention.

But why is it so expensive to defend a patent suit? The answer is twofold. First, there are endless procedural devices in the hands of a patent holder willing to use them. And, second, the factual issues in patent cases are made unnecessarily complex by the doctrinal difficulties of the invention requirement. These are not the fault of the Patent Office. If fault is the appropriate word, surely Congress and the Supreme Court must share the blame.

A determined patent holder is in a position to keep relitigating the validity of his patent against the infringing manufacturer and his customers. These suits can be brought in every part of the country. 208 Motions under § 1404(a) for transfer and consolidation can be made, ruled on, and taken to the courts of appeals. 209 The factual issues are "complicated" and summary judgment is seldom available. Discovery procedures can be used to increase the costs that a patent-infringement action inflicts on the defendant. The Supreme Court must bear some responsibility for failing to keep these abuses in check.

For fifteen years the Supreme Court failed to take cases raising the issue of non-obviousness. Differences have arisen among the circuits, encouraging litigants to engage in complex maneuvering to get in the "right" court. It is traditionally said that the facts in patent cases are extremely complicated. This is not true. The facts in patent cases, as in any other class of cases, are sometimes com-


208 28 U.S.C. § 1400 provides for venue where "the defendant has committed acts of infringement and has a regular and established place of business." In the case of an infringing product sold throughout the country, the provision permits suit to be brought almost anywhere.

209 I have discussed these problems elsewhere. Kitch, Section 1404(a) of the Judicial Code: In the Interest of Justice or Injustice, 40 Ind. L.J. 99 (1965). They are particularly troublesome in patent cases.
plicated and sometimes simple. *Deere, Adams,* and *Cook* are examples of cases in which the facts themselves are simple and easily understood. But even simple facts become complicated if there are no controlling legal principles around which they can be organized. In a case as simple as *Deere* two circuits differed on the validity of the patent, not because they differed on the facts, but because they differed regarding the law. These failures of the Court are perhaps minor when one considers the heavy responsibilities that it has in other more important areas. But it ill becomes the Court, whose own performance in the area has suffered from lack of interest, to castigate the Patent Office for "debilitating" the patent system.

The Patent Office has remained insensitive to the requirement that invention must be shown for patentability because it applies the "inventive novelty" law that was in force prior to 1875. The basic question for a Patent Office examination is whether the device is new. The primary effort of the examiner is to have the claims narrowed so that they only read on what is new in the development. There seem to be two important reasons for this apparent disregard of the invention requirement. The first lies in the history of the Patent Office and the law. The Patent Office as presently organized has been an on-going institution since 1836. During the first thirty-nine years of its life, it quite appropriately applied the controlling law of inventive novelty. Since that time its internal traditions have perpetuated the approach. This tendency has been condoned by the Supreme Court, which never, until *Deere,* suggested that the inventive novelty approach was inconsistent with non-obviousness. The second reason is the organization of the Patent Office itself. Because of the heavy backlog of applications there is pressure on examiners to dispose of them. If an examiner approves the application, the matter is closed. If he denies it, the applicant has a right of appeal up through the Patent Office to the Court of Customs and Patent Appeals and now to the Supreme Court. 210 Such an appeal places additional burdens on the office. At the very least, it is considered undesirable for an examiner to be reversed once an appeal is taken. 211 In this situation even a

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conscientious examiner is unlikely to reject an application unless he is sure of his ground. A rejection for lack of novelty is relatively stable ground. If something is not new, it is hard for the applicant to argue that it is. But a rejection on grounds of non-obviousness is shakier because it may involve differences in judgment between the examiner and the review board.

It is even possible to argue that it is not the duty of the Patent Office to screen out non-obvious patents. Why should not the Patent Office concentrate on weeding out those applications that do not involve new developments? When a patent is granted on an innovation, it assures that information about it is placed on the public record. At the Patent Office stage in the proceedings it is difficult to predict whether the patent will ever be important or the subject of controversy. The ex parte proceeding of the Patent Office is not the best forum in which fully to ventilate the validity issue.\textsuperscript{212} If the validity issue is determined negatively, the information about the innovation is never placed on the public record. Why should the resources necessary to make the non-obviousness determination be expended unless the validity of the patent actually matters? Once it matters, the courts can provide a forum in which the validity issue can be litigated. Although this is not the system contemplated by the statute, it has long been the \textit{de facto} system in American patent law.\textsuperscript{213} And it would work, if the courts provided a reasonably efficient and conclusive forum

\textsuperscript{212} In \textit{Walker Process Equip., Inc. v. Food Mach. & Chem. Co.}, 382 U.S. 172 (1965), the Court held that the enforcement of a patent obtained by fraud on the Patent Office is actionable under the Sherman Act. If "fraud" is interpreted to include negligent failures to cite prior art, the decision should have an impact on the amount of prior art brought to the examiner's attention. But it may not be wise to reform Patent Office procedure by using the threat of a punitive statute to force the applicant to be his own adversary.

\textsuperscript{213} The Court of Customs and Patent Appeals and the Patent Office recognize this in the "rule of doubt." This rule is that in cases of doubt concerning patentability, the doubt should be resolved in favor of the applicant. "There are very sound policy reasons underlying the rule applied in this court, and supposedly in the Patent Office, that doubts are to be resolved in favor of applicants. Several of the factors properly taken into account in determining patentability, especially unobviousness and utility, are often not known at the time when the application is being prosecuted in the Patent Office but are developed later, perhaps even after the patent is issued. It therefore is proper that doubt should be resolved in favor of applicants so that they shall not be denied patents which later events may show them entitled to." \textit{In re Hofstetter}, 150 U.S.P.Q. 105, 109 (C. C. P. A. 1966).
for the adjudication of validity. The present statutory framework makes this difficult for the courts, but they have not done their best to maximize their effectiveness even within this framework.

*Deere* points in the direction of removing complicating doctrinal irrelevancies and returning patent law to the relative simplicity of the statute. It is a significant step toward the improvement of the patent system if the courts are willing to insist that the inquiry be focused on the statutory test of non-obviousness. It is perfectly possible for the tradition-minded reader to interpret the opinions in *Deere*, *Adams*, and *Cook* as simply continuing past doctrine.\(^{214}\) The myth of *Hotchkiss v. Greenwood* seems to be part of an even larger myth in patent law—the myth that invention decisions differ only on the “facts” or the “attitude” of the court, but that they all embody the same law. The courts ought not permit this myth to overtake *Deere*.

\(^{214}\) See Brumbaugh, *The Standard of Patentability Now*, 21 Record 291 (1966). Brumbaugh reads *Adams* as continuing the inventive novelty tests under § 101 and views § 103 as simply an additional negative test. This is, of course, the scheme of the Walker treatise.