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Rules for Determining What is Invention

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THE laws of the United States provide for the encouragement of inventors and the promotion of technological advances through the issuance of patents for new and useful inventions. Authority for these laws is found in the constitutional provision:

"The Congress shall have Power . . . To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries . . . ."

The latest statute, The Patent Act of 1952, which became effective in 1953, provides: "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 . . . ."

The courts have long held that there is no distinction between the terms "invention" and "discovery" as recited in the Constitution, and as these terms are used in patent law. The difficult question for patent attorneys and the courts is: "What is invention"? The meaning of this term has never been positively defined by Congress or by the courts. Instead, invention has always been defined negatively, that is, by statements of what is not invention.

As used in patent law the term invention includes two elements: first, the process or product which is invented; and second, and more difficult of definition, the creative act of the inventor. Perhaps as good a positive definition as can be devised is given by Black's Law Dictionary, which defines invention in patent law as:

"the act or operation of finding out something new; the process of contriving and producing something not previously known or existing, by the exercise of independent investigation and experiment."

However, this attempt at a positive definition of invention omits some qualifications and limitations imposed by the patent statutes and by the courts.

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WHAT IS INVENTION

Obviousness

One test of invention provided by the revised statute\(^5\) is that of obviousness. Even though one may devise a new machine or process or product which has never before existed, if all of the elements of the machine, steps of the process or parts of the product are old, and if no unexpected results or functions obtain, he may not have made an invention. In order to constitute an invention there must be not merely something new but something out of the ordinary.\(^6\) In other words, if the new thing produced is merely a result of routine engineering or design, and if it would have been obvious to anyone "ordinarily skilled in the art" to produce the thing in the manner disclosed, then it does not rise to the dignity of invention.

A patent decision in the District of Columbia indicates the courts' view of what constitutes the dignity of invention:

"Inventions are somewhat like precious jewels, whose value is indicated not so much by size as by brilliance. If a mechanical change or routine adjustment produces merely a mechanical or routine result it is not invention, even though it is improvement. But if a change or adjustment produces an extraordinary result, then the change or adjustment takes on something of the character of the accomplishment."

"... The extraordinary nature of an accomplishment implies an extraordinary use or application of the ordinary implements and a more profound understanding of the science, art or craft; and if the use or application is original and useful, it is invention. If the trend of the teaching of prior art had been against such use for the desired result, ... then that is additional proof of invention. A sound public policy supports the provision of the patent law to promote the progress of science by securing to inventors the exclusive right to their 'discoveries.'"

The district court reversed the Patent Office and ordered the Commissioner to issue a patent to the plaintiff on his invention of a colored fluorescent material having means to filter ultraviolet rays, whereby the

\(^5\) 35 U.S.C.A. § 103 (1954): "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."


\(^7\) The meaning of the term "ordinary skill of the art" has never been finally resolved, but it is clear from many decisions (since Hotchkiss v. Greenwood, 52 U.S. (11 How.) 248 (1850)) that this does not mean merely that skill possessed by an ordinary mechanic (unless the invention is an ordinary mechanical one). Rather, this term of art apparently is intended to mean the ordinary or routine skill of a scientist, designer, or engineer who is fully qualified for professional work in the particular art to which the subject matter of the invention relates. See 2 Robinson, Patents § 488 (1890); 2 Walker, Patents 746-49 (Deller ed. 1937). See also Sinclair Co. v. Interchemical Corp., 325 U.S. 327, 330-31 (1945).

colors would not fade so readily when the material was exposed to daylight. Even though the plaintiff’s fluorescent material was old in the art, and filters opaque to ultraviolet light were also old in other arts, the court held that plaintiff’s combination of a colorless ultraviolet light absorber in connection with fluorescent dyed filaments was an invention. In other words this combination was held not to be obvious, as the Patent Office had contended.

In a more recent decision by the same court the Patent Office was ordered to issue a patent to the plaintiff on his invention of threaded connectors for joining oil well drill collars and drill pipe, where the essential feature was merely the use of screw threads in which the angle between adjacent sloping sides of each thread was ninety degrees, as contrasted with the sixty-degree crest angle of the prior art. The Patent Office had refused a patent on the ground that the substitution of ninety degrees for the prior sixty-degree crest angle was obvious and did not amount to invention, particularly in view of prior use of ninety-degree threads in other arts on solid rods rather than on pipes. The court found, however, that though the change was simple, the effect was a striking improvement in the art of deep well drilling, inasmuch as the ninety-degree threads did not strip or break at great depths as the sixty-degree threads of the prior art had done. The district court also found that “... the plaintiff expended a great deal of effort and money to accomplish the desired result” and, furthermore, that the problem which he solved was one that had long plagued the oil industry. By implication, the plaintiff’s solution was not obvious to those skilled in this art, as evidenced by their failure to discover it even though the need was very great. Hence this was held to be a patentable invention.

Whether a new development is an obvious one is a question which is incapable of determination in the abstract. The particular facts and circumstances surrounding each new development must be considered and weighed as a whole. The question of obviousness should be judged as of the time the invention is made, in the light of the then existing knowledge and state of the art. This test imposes a particularly difficult burden upon judges who may be called upon to determine the validity of a patent many years after an invention is made. In such circumstances, hindsight often affords the court a poor view of the inventor’s foresight at the time of making his contribution to the art. The courts are far from infallible in applying this test.

10. Id. at 228.
A good illustration of this problem is Marconi Wireless Tel. Co. v. United States, decided by the Supreme Court in 1943. This case involved a number of basic patents on radio, for the infringement of which the patent owners commenced action against the United States Government in 1916. The Marconi patent was issued on June 28, 1904, upon an application filed on November 10, 1900. Litigation of the controversy was interrupted and delayed by two World Wars, and when the case finally reached the Supreme Court, forty years later, a majority of the justices held the broad claims of the Marconi patent to be invalid for lack of invention. This determination hinged upon the question of whether Marconi’s creation of wireless telegraphy was the result of inventive skill or “ordinary skill in the art.” Three justices dissented. Mr. Justice Frankfurter in his dissenting opinion stated:

“It is an old observation that the training of Anglo-American Judges ill fits them to discharge the duties cast upon them by patent legislation.

“... The real question is how significant a jump is the new disclosure from the old knowledge. Reconstruction by hindsight, making obvious something that was not at all obvious to superior minds until someone pointed it out,—this is too often a tempting exercise for astute minds. The result is to remove the opportunity of obtaining what Congress has seen fit to make available.

“The inescapable fact is that Marconi in his basic patent hit upon something that had eluded the best brains of the time working on the problem of wireless communication—Clerk Maxwell and Sir Oliver Lodge and Nikola Tesla.”15

Mr. Justice Rutledge in a separate dissenting opinion stated further:

“... Until now law has united with almost universal repute in acknowledging Marconi as the first to establish wireless telegraphy on a commercial basis. Before his invention, now in issue, ether-borne communication traveled some eighty miles. He lengthened the arc to 6,000. Whether or not this was ‘inventive’ legally, it was a great and beneficial achievement. Today, forty years after the event, the Court’s decision reduces it to an electrical mechanic’s application of mere skill in the art.

“... By present knowledge, it would be no more. School boys and mechanics now could perform what Marconi did in 1900. But before then wizards had tried and failed. The search was at the pinnacle of electrical knowledge. There, seeking, among others, were Tesla, Lodge and Stone, old hands and great ones. With them was Marconi, still young as the company went obsessed with youth’s zeal for the hunt.”16

The language of the dissenting opinions quoted above also indicates one of the best tests for obviousness. That is, if a problem has long existed without a satisfactory solution, and if a number of skilled workers

15. 320 U.S. at 60-62.
16. Id. at 64-65.
have endeavored to solve the problem but their efforts have met with less than complete success, then whoever is the first to devise a satisfactory solution has made an invention no matter how simple or obvious his solution may appear by hindsight. On the other hand, if a number of workers independently arrive at the same solution at about the same time, these facts tend to indicate absence of invention and suggest instead that the solution may have been obvious to those workers skilled in the art.

It will be appreciated that early recognition of a problem, of a need to accomplish an end or to improve the existing art, may be a very important step in the act of invention. He who first perceives a problem and conceives a complete solution may make an invention even before others have given any serious consideration to possibilities of improvement in that particular art. When this is the case, the question of whether or not the invention was obvious may often be held in abeyance, and the inventor may be well advised by his patent attorney to proceed with a patent application, particularly if the invention is in a crowded or highly competitive field. If others have made the same invention at about the same time, Patent Office interferences may be declared with their applications, and the question of who was first will thereby be determined.

A New Combination of Old Elements

A positive rule, to which the courts at least pay lip-service, is that a new combination, even if it embody only old elements, may be invention. A recent decision in the District Court for the District of Columbia has applied this rule affirmatively in a case where the inventor freely admitted that there were no new elements in his invention, but nevertheless the court ordered the Patent Office to issue him a patent for his new combination of old elements in a very useful device for pouring molten steel. This invention comprised a portable hydraulic power

17. See notes 8 and 9 supra.
18. Wall Pump & Compressor Co. v. Gardner Governor Co., 28 F.2d 334, 339 (7th Cir. 1928): "It is of much significance here that about the same time several important builders of such machines—without relation to each other, and, so far as the evidence discloses, without knowledge of what Gardner or the others were doing—designed and built machines which substantially embody the elements of the patent, without themselves claiming to be inventors. Such a situation is instructively dealt with in section 25 of Walker on Patents, where it is stated: 'The absence of invention may be established in some cases, by evidence that a considerable number of persons who were not inventors, acting independently of each other, and without receiving any information from the patentee or his patent, did in fact contrive the improvement claimed therein, not long after he produced it.'"
19. 1 Walker, Patents 147, 215, 224, 286 (Deller ed. 1937).
control, known commercially as “Autopour,” for controlling the flow of molten steel from the bottom of ladles. The inventor conceded that bottom pouring ladles with vertical stoppers had been used throughout the steel industry for fifty to seventy-five years and also that hydraulic force devices similar to that incorporated in his disclosure had been used in many different types of machines for some thirty years. But the inventor contended, and the court agreed, that his adaptation of hydraulic power for the purpose of controlling the ladle stoppers brought radically new and different results by way of increased safety and precision manipulation. More frequently, however, acknowledgement of this concept appears in dissenting opinions, or in cases holding that the particular subject matter does not constitute invention because it does not represent a valid combination.

Inventions may be embodied in new machines which are combinations of mechanical parts; or they may involve electrical circuits—as, for example, radio circuits—which are combinations of electrical elements; or they may embody a combination of chemical substances in a new chemical composition; or a combination of steps in a new process. Even a new part or element for use in a machine or in an electrical circuit usually involves a combination of sub-elements when it is analyzed in detail. The diode valve of Fleming and the triode tube of DeForest, both of which are extensively used as elements in radio circuits, embody a combination of sub-elements or parts. Similarly in chemical processes, where a combination of steps or operations is performed to produce a desired end result or product, one or more of the elemental steps of the process may require a chemical compound which itself embodies a number of basic chemical elements in chemical combination.

**Combination v. Aggregation**

Practically all inventions require a combination of one sort or another. A crucial test of invention is whether the claimed invention is really a valid combination or whether it is merely an aggregation. The courts have long held that mere aggregation is not invention. A frequently applied criterion of patentable combination is that the elements must coact or cooperate, one with another, to produce the desired useful result. This is not to say that all of the elements must

23. See notes 21 and 22 supra.
24. Independent Oil Well Cementing Co. v. Halliburton, 54 F.2d 950 (10th Cir.), cert.
be active at the same instant of time,\textsuperscript{25} nor that each element must necessarily coact with every other element in the combination,\textsuperscript{26} but all of the elements must contribute in some way to a unitary end,\textsuperscript{27} and the contribution of each element must be more than a mere additive effect.\textsuperscript{28} In other words, each element must be necessary to the operation of the combination as a whole. This criterion of cooperation between elements of a patentable combination applies whether or not the elements themselves are old.\textsuperscript{29}

This concept has been variously stated by the courts ever since the historic case of \textit{Reckendorfer v. Faber},\textsuperscript{30} in which the Supreme Court declared invalid a patent on a lead pencil having an eraser affixed to one end. The Court held that there was no cooperation, or joint action, between the pencil and the rubber eraser, but rather that each performed its own function in exactly the same way as they did before the separate elements were joined in a single article of manufacture. In that case the Court stated:

"The combination, to be patentable, must produce a different force or effect, or result in the combined forces or processes, from that given by their separate parts. There must be a new result produced by their union: if not so, it is only an aggregation of separate elements. An instance and an illustration are found in the discovery, that, by the use of sulphur mixed with India rubber, the rubber could be vulcanized, and that without this agent the rubber could not be vulcanized. The combination of the two produced a result or an article entirely different from that before in use. Another illustration may be found in the frame in a saw-mill which advances the log regularly to meet the saw, and the saw which saws the log; the two co-operate and are simultaneous in their joint action of sawing through the whole log: or in the sewing-machine, where one part advances the cloth, and another part forms the stitches, the action being simultaneous in carrying on a continuous sewing. . . ."
double effect is produced or a double duty performed by the combined result. In these and numerous like cases the parts co-operate in producing the final effect, sometimes simultaneously, sometimes successively. The result comes from the combined effect of the several parts, not simply from the separate action of each, and is, therefore, patentable.”

In another case, a lower court, following this authoritative rule of the Supreme Court, stated the test thus:

“The test is whether the combination discloses a co-operation or a co-ordination of the elements which, working together as a unit, although mayhap not simultaneously, produces a new or better result.”

At least one judge has used an illustrative analogy which perhaps explains the distinction between inventive combination and mere aggregation more effectively than does the language of the Supreme Court:

“A rough analogy, that cannot be pressed too far, has repeatedly occurred to me in considering this question. I think of a football team as a combination; one passes, one receives, another blocks, another runs, and still others hold the line. Eleven men are doing different things, each in his own way, and not always simultaneously; yet they are working to a common end, to advance the ball; and they coact as a unit. I think of a track team as an aggregation; one runs, another hurdles, another jumps, another throws. They all work for a common general end, to amass points for their alma mater; but there is lacking the vital spark of co-operation or co-ordination. They work, not as one unit, but as several.”

Substitution of Equivalents

Another rule of invention is that mere substitution of an equivalent element in an old combination is not invention, unless a new and unexpected result is obtained. This rule, like the others discussed above, is more easily stated than it is applied, because the difficult question arises as to what is an equivalent.

In some cases, of course, equivelancy may be obvious, as, for example, where a patented machine is operated by an internal combustion engine it would not normally be invention to substitute an electric motor for the gas engine. Or in the case of a mechanism employing spring loading to maintain a desired relation between two parts, it would ordinarily not be invention to substitute a weight for the spring so that the force of gravity is employed to retain the desired relation. Similarly, if prior inventors have employed hydraulic or pneumatic means in a particular

31. Id. at 357.
32. Skinner Bros. Belting Co. v. Oil Well Improvements Co., 54 F.2d 396 (10th Cir. 1931).
33. Id. at 898.
34. Id. at 898-99, by McDermott, J., quoted in Gray v. Texas Co., 75 F.2d 606, 609 (8th Cir. 1935).
combination, it would ordinarily not be invention to substitute electric or spring-powered means for the hydraulic or pneumatic means of the prior art.

Clearly it is not invention in an old combination to substitute roller bearings for a sleeve bearing, or ball bearings for roller bearings, although the original developments of both roller bearings and ball bearings were patentable inventions. Nor is it invention to employ an electrical lock-out device in lieu of a prior mechanical lock-out. This was the holding of a district court in the case of Burt v. Bilofsky:6

"The question presented for determination is whether or not the patentee's improvement... was such an advance over the prior art as will support the claim to patentable invention.... The substitution of an electrically operated lock-out device for the mechanically operated lock-out device... required nothing more than the expected ingenuity of a skilled mechanic...

"The purported invention of the respective claims in issue comprises nothing more than an assemblage of old elements in a circuit in which these elements perform no new or different function. It is well established that such assemblages are patentable 'only when the whole in some way exceeds the sum of its parts.'"38

The Patent Office and the courts have evolved two general tests of equivalency. First, do the two elements perform an identical function? Second, do they perform that function in substantially the same way? If the answers to both of these questions are in the affirmative, then the elements are equivalents and there is no invention in substituting one for the other. The same tests are applied in determining questions of infringement, where the alleged infringement is not exactly the same as the patented invention.40

An example of a mechanical equivalent was an automatic margin regulator for typewriters in which the defendant's infringing mechanism had one member that combined the functions of two elements as disclosed and claimed in the patent. The defendant's single element was held to

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39. 1 Walker, Patents 258-59 (Deller ed. 1937).
be equivalent to the patentee's two elements, and hence constituted an infringement.\textsuperscript{41}

**NEW ELEMENT IN OLD COMBINATION**

An old combination cannot be patented as a new invention by the mere substitution of a new element in the combination, whether or not the substituted element is novel.\textsuperscript{42} This maxim may appear self-evident, and yet cases arise repeatedly in which patentees think they have invented a new machine or device simply because they have improved one part or element of a prior art mechanism.\textsuperscript{43}

A leading case decided by the Supreme Court illustrates this situation. In *Bassick Mfg. Co. v. R. M. Hollingshead Co.*,\textsuperscript{44} the plaintiff obtained a patent on a device for lubricating automobile bearings. He claimed as his invention a combination of a grease gun, a connecting hose, and a type of coupler for connecting the hose to the bearing to be greased. The Court found that grease guns with a connecting hose and different types of couplers were old in the prior art, and therefore ruled that plaintiff had not invented the combination which he claimed. All that he had invented was the coupler. As this part could be manufactured and sold separately from the grease gun and hose, the plaintiff was not allowed to collect patent royalties on the complete assembly including hose and grease gun, but only on the inexpensive coupling. A more obvious example is that one cannot repatent an automobile simply by inventing an improved carburetor, although one may obtain a valid patent on the carburetor itself if it meets all the other tests of invention.

**SUBSTITUTION OF MATERIALS**

Yet another rule of invention, which is in reality another aspect of the doctrine of equivalents, is that ordinarily mere substitution of one material for another is not invention, even if the substituted material has never been used in that combination before, unless a new function or result is obtained.\textsuperscript{45} If a device of the prior art has been made of metal, it would ordinarily not be invention to make the same device of plastic. However, if the substitution of plastic for metal produced a new result which was not obvious or wholly to be expected from the known characteristics of the material, then the substitution might constitute invention.

\textsuperscript{41} Royal Typewriter Co. v. Remington Rand, Inc., 168 F.2d 691 (2d Cir. 1945).

\textsuperscript{42} Lincoln Engineering Co. v. Stewart-Warner Corp., 303 U.S. 545 (1938); American Steel Wire Co. v. Coe, 105 F.2d 17 (D.C. Cir. 1939).

\textsuperscript{43} See 69 C.J.S., Patents § 68 (1951) and cases cited in nn.90-91.

\textsuperscript{44} 298 U.S. 415 (1936).

\textsuperscript{45} Atlantic Works v. Brady, 107 U.S. 192 (1882); Schrüber v. Coe, 119 F.2d 459 (D.C. Cir. 1941); Leibling Automotive Devices, Inc. v. Wildermuth, 104 F.2d 411 (2d Cir. 1939); In re Walters, 35 C.C.P.A. (Patents) 1160, 168 F.2d 79 (1943).
It has been held that in the manufacture of gaskets, the substitution of Thiokol synthetic for natural rubber was not invention. Yet in United Shoe Mach. Corp. v. E. H. Ferree Co. it was held that the substitution of aluminum alloy for the cast iron arm of a shoe manufacturing machine was invention. But in this case it appeared that others before the patentee had repeatedly tried to use aluminum for this part, and that their efforts had failed because of the inability of their aluminum arms to withstand the heavy forces required in the machine. The inventor’s patent was upheld because he had devised a lightweight member of aluminum alloy which successfully withstood the required forces.

**Change in Size, Degree or Speed**

Still another rule of invention is that merely changing the size, shape, degree or speed of a thing is not invention, unless the change produces a new mode of operation or a new function. Because of the complexity of factual situations which frequently surround new developments in science and technology, this simple rule is not always easy to apply. A penetrating analysis of the facts is frequently required.

The Supreme Court applied this rule in the case of DeForest Radio Co. v. General Elec. Co. where the Court considered a patent claiming an improvement in a high-vacuum radio tube having a higher degree of vacuum than in tubes of the prior art. This was held to be a question of degree and therefore not an invention. The Court found that the theoretical advantages of a complete vacuum had long been known to workers in the art of making radio tubes, and that with the improvement in apparatus for creating a better vacuum, superior vacuum tubes naturally followed.

In Edison Elec. Light Co v. United States Elec. Lighting Co., Thomas A. Edison was held to have made an invention in the field of incandescent lamps, even though the crux of his invention appeared to be the mere reduction of the diameter of the lamp filament to one-half its original size. This change in filament size produced a new mode of operation and a new result. The smaller diameter resulted in the increase of the electrical resistance of the filament by a factor of four, decreasing the radiating surface to half the former area, and thereby increasing the ratio of resistance to radiating surface by a factor of eight, which change made the incandescent lamp a practical operable device.

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47. 64 F.2d 101 (2d Cir. 1933).
49. 52 Fed. 300 (2d Cir. 1892).
WHAT IS INVENTION

ADDITION OR OMISSION OF PARTS

A corollary to the rule that aggregation is not invention is the rule that the mere addition of parts to a device to constitute a difference in structure from the prior art is not invention, unless the added parts co-operate with the old structure to produce a new function or result. By the same token, it is not invention to duplicate parts, elements or sub-combinations of the prior art. For example, given the prior invention of a radio receiver comprising a detector and one stage of audio amplification suitable for radio reception by headphones, it would ordinarily not be considered invention to add further stages of amplification to produce a radio capable of loud speaker operation, even though no one had ever built a radio with a loud speaker before.

An early case, in which a court held the addition or multiplication of parts to be an invention, illustrates the exception to this rule. The invention was in the field of water turbines for deriving power for mills, and it comprised mounting two water propellers in proximity to each other on the same vertical shaft. In the prior art only one propeller had been used, and the downward thrust caused by the water striking the propeller necessitated a heavy thrust bearing on the shaft, with an accompanying loss of power through friction. The inventor discovered that by the addition of a second propeller, placed beneath the first, the water passing through the turbine could be caused to produce an upward thrust on the shaft to counteract the downward thrust of the first propeller, and thereby reduce the bearing friction.

Similarly, the omission of parts from a prior art device is not ordinarily an invention, unless by the omission an unexpected result is obtained. However, if one part can be made to perform the functions of two or more parts in the prior art device, and if the parts which have been omitted had formerly been essential to the prior invention, then the omission of parts may constitute a new combination which is a real invention. In highly competitive industries, where price, size or weight of a commercial product are significant factors, improvements in the art

51. Stirling Co. v. Standard Snuff Co., 137 Fed. 94 (C.C.M.D. Tenn. 1902) (patent disclosed and claimed boiler construction having "a single mud drum"; defendant later built boiler having two mud drums—this was no invention but was held to be an infringement of the prior patent).
53. See note 40 supra.
54. Lambert Hoisting Engine Co. v. Lidgerwood Mfg. Co., 154 Fed. 372 (3d Cir. 1907). Where three separate elements in a prior device, each performing an individual function, were supplanted in a later device by a single element which performed the functions of all three, the single element was held not the equivalent of the three separate elements.
are sometimes made by the omission of parts previously thought to be essential, and where such omission was not obvious to others in the art it may very well be patentable invention.

COMMERCIAL SUCCESS

Commercial success of a new development, device or product does not necessarily prove that its concept amounted to invention, although such success may be admitted as evidence, and in a proper case may tilt the balance in favor of a finding of invention.

Of course, commercial success may be attributed to many other factors than the inventor's solution of a long felt need in the art. It may be due to fortuitous business connections, to intensive advertising promotion, or to such economic factors as availability of materials or labor at a cheap price. Because so many diverse factors may influence commercial success, the general rule of the courts is that it should not be determinative of the question of invention except in cases where the issue of invention is itself in doubt.

FURTHER RULES AND THEIR EXCEPTIONS

There are other limitations than those outlined above, but most of these are corollaries of the foregoing rules. For example, it is ordinarily not invention to make a device portable. Neither is it invention to produce an article or device which differs from the prior art only in excellence of workmanship. Nor is it ordinarily invention to use an old device for a new or analogous purpose. However, the revised patent statute expressly provides that a new use of a known process, machine, manufacture, composition of matter, or material is recognized as an invention and may be patented as a new process, provided all the other conditions of patentability are met.

ORDINARY SKILL OF THE ART

All of the rules of invention are tempered by recognized exceptions, the fundamental rule being that it is invention to produce a new and non-obvious function, or a new and unexpected result, whether or not

56. Sampson-United Corp. v. Sears, Roebuck, & Co., 103 F.2d 312 (2d Cir. 1939).
61. 35 U.S.C.A. § 100(b) (1954).
the means employed are individually new, so long as the invention is beyond the ordinary skill of the art.

Lawyers and the courts, as an aid in measuring invention, have adopted a hypothetical man who serves as a yardstick in patent cases, very much in the same manner that the "reasonably prudent man" serves in negligence cases. However, the patent lawyers' legendary man must be more than reasonably prudent. He must be a paragon of knowledge who has read everything that is published and knows everything that is patented in the art throughout the world; he is that flawlessly educated scientist who is designated "the man skilled in the art." The test is very simply stated: if the subject matter was not obvious to the man skilled in the art at the time it was discovered, it constitutes invention. On the other hand, if it would have been obvious to this fellow skilled in the art, then it is not invention.  

This test is comforting only because it is so easily stated. Its application is fraught with difficulty.

One such difficulty is that the man skilled in the art is often allowed a degree of foresight denied the less fortunate remainder of humanity. In other words, in determining the obviousness or non-obviousness of particular subject matter to this person hypothetically skilled in the art, the courts know the result to be attained. It is far easier to find a route to a particular place when one knows where he is trying to go. The one who originally located the spot may have had no such predetermined goal. Often it is the desirability of the particular goal and not the means for its attainment which is non-obvious.

When it comes to determining invention in the trial of a patent case, we find a federal judge, who, in all probability, is totally unskilled in the technical art to which the patent pertains, deciding what one skilled in that art, and having read and understood all pertinent prior publications, would have considered obvious, not as of the time of the trial but as of the patentee's date of invention. This difficult decision poses a tedious task not only for the judge but also for the attorneys who must explain the technical facts of the case. This task, however, is not impossible. It may be effectively accomplished through the aid of expert witnesses.

THE VARIABLE STANDARD OF INVENTION

A greater difficulty today is the indeterminate level of the standard of invention. Handling of "invention" as compared with "obviousness" is a problem of long standing, and one which has seemed to defy helpful judicial definition. In 1885, the United States Supreme Court stated that invention as distinguished from obviousness appears "... to spring

62. See 69 C.J.S., Patents § 55 (1951) and cases cited in nn.20-31.
from that intuitive faculty of the mind put forth in the search for new results, or new methods, creating what had not before existed, or bringing to light what lay hidden from vision. . . . " In 1891, without measurable clarification, the Court defined invention as "... that impalpable something which distinguishes invention from simple mechanical skill." Despite the obvious difficulties in defining the inventive concept, this test was applied for a number of years with considerable success, and at a reasonably constant level.

Invention being incapable of absolute definition, and its presence or absence being largely sensed rather than determined, the standard of invention is necessarily a variable one. Whatever may be the difficulties in sensing invention in mechanical or electrical cases, the difficulty in chemical cases is compounded by the judicially accepted fact that reasoning by analogy is much more restricted in the chemical field. Chemistry is acknowledged to be an essentially experimental science with an extremely low rate of predictability as compared with other fields. Neither chemistry nor any other exact science could long flourish on non-constant standards, but patents got along quite well on that basis for some time. For many years, with few exceptions, the standard of invention did not depart far from a median line.

Then came the depression of the nineteen-thirties when, in searching for the elusive key to economic deterioration, a substantial number of politicians settled on the patent system as blamable for various and assorted economic ills. Hearings by various government agencies were conducted and reported. During this period there was considerable change in judicial personnel, both in the Supreme Court of the United States and the lower federal courts. There seems to have grown up, at least in the Supreme Court, a feeling that a higher standard of invention was required. In other words, that which had heretofore been non-obvious to a hypothetical man skilled in the art must now be considered obvious to him.

In 1941, the Supreme Court announced that subject matter to consti-
tute invention "must reveal the flash of creative genius." This pro-
nouncement at the time created quite a flurry in the courts and among
the patent bar, since it seemed to render non-inventive all save the most
exceptional advancements in the art. But it was soon discredited by the
lower courts as a helpful guide. However, in 1950 some members of
the Supreme Court, apparently still undaunted, in a dissenting opinion
sought to define invention as "to push back the frontiers of chemistry,
physics and the like." Thoughtful consideration of the decisions
demonstrates that judicial determination and appreciation of the stand-
ard of invention is clearly not a science, though it may be an art.

These judicial onslaughts have greatly increased the standard of the
expected skill of the art. While to a considerable extent they have con-
fused rather than clarified the situation, they have nevertheless resulted
in substantially increasing the standard of invention which the courts
apply today. It is generally the opinion of the patent bar that this trend
of increasing the standard of invention, which has been in progress for at
least twenty years, has now about expended its force and that at the
present time a plateau has been reached which will presumably not be
exceeded in the foreseeable future.

In the revised patent statute which became effective in 1953, Con-
gress rebuffed the extreme doctrine of the Supreme Court that an inven-
tion must display a "flash of genius," or must "push back the frontiers
of science." The significance of this statutory change has not yet been
passed upon by the Supreme Court, but in the Second Circuit Judge
Learned Hand has in effect held that the revised Patent Act of 1952
lowered the standard of invention. Judge Frank, however, expressed
serious doubts about the correctness of Judge Hand's interpretation,
while Judge Kalodner, in the Third Circuit, is "... inclined to accept
the sensitive observations of Judge Learned Hand as to the judicial

70. The Court of Appeals for the Seventh Circuit flatly refused to follow the "flash of
genius" test in one case, saying "... [such test] would eliminate nearly all the advances of
history, in science, and in the field of mechanics. ... [It] should be rejected not only
because it is incapable of acceptable definition but because it injects into the statute some-
thing not appearing therein." Chicago Steel Foundry Co. v. Burnside Steel Foundry Co.,
132 F.2d 812, 817 (7th Cir. 1943).
(1950).
72. Libert, Section 103 of the Patent Act and the Standard of Invention: Comments on
74. Lyon v. Bausch & Lomb Optical Co., 224 F.2d 530 (2d Cir.), cert. denied, 350 U.S.
911 (1955).
tendency of recent years, even within the language of the older decisions, to expect an indefinite 'more' of the proffered invention." 76  All of the circuits have not yet been heard from on this matter, and the decisions of the lower courts to date show a wide area of disagreement on the interpretation of section 103 of the Act as relating to the standard of invention. 77

Regardless of the difficulty of judicially determining what is invention, we may well agree with the late Professor Whitehead that "the greatest invention of the nineteenth century was the invention of the method of invention." 78

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76. R. M. Palmer Co. v. Luden's, Inc., 236 F.2d 496 (3d Cir. 1956).