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Patentable Invention

Eugene C. Knoblock

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PATENTABLE INVENTION

The most persistent and frequent question which one practicing in that highly specialized branch of the law, Patent Law, is called upon to answer is: "Does this device involve a patentable invention?" Its answer is as elusive as the well known eel, as subject to difference of opinion as the prohibition question, and about as indefinable as a state of mind; and all this in spite of multitudinous decisions ranging from *ex parte* cases decided by Patent Office tribunals to hotly contested *inter partes* cases decided by the United States Supreme Court. It may therefore be of interest to consider some of the fundamental concepts by which one must be guided in giving an answer in any particular case.

The Constitution of the United States¹ provides for the granting of patents in the following words:

"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 Statutes² cover the matter in the following words:

"Any person who has invented or discovered any new and useful art, machine, manufacture, or composition of matter, or any new and useful improvements thereof . . . may, upon payment of the fees required by law, and other due proceedings had, obtain a patent therefor."

The Constitution and Statutes thus circumscribe the inventions on which patents may be granted to those directed to an art, machine, manufacture, composition of matter, or to improvements thereon. Of these enumerated classes of patentable invention, all but "art" are clear and definite. With respect to "art" it has generally been held that the

¹ ART. I, Sec. 8.

² REVISED STATUTES OF THE UNITED STATES §4886.

class of invention there referred to is one directed to a method or process of doing or making something, and is particularly applicable to inventions involving chemical processes,³ and to new and improved methods involving a series of mechanical operations which are not the function of a machine but which may be performed by a machine.⁴ A process which is a mere function of a machine is not patentable, however.⁵ The class "art" has also been held not to cover discoveries in pure science, such as the discovery of physical laws and scientific principles;⁶ nor methods of doing business;⁷ nor code messages;⁸ nor the arrangement of a room in a house;⁹ nor printed matter or forms;¹⁰ nor a railway tariff index;¹¹ nor a mathematical formula;¹² nor the arrangement of information on the leaves of a book.¹³

The Constitution and Statutes require that the *res*, to be patentable, must have been "invented" or "discovered," but they do not define what a patentable invention or discovery is, and they fail to indicate criteria by means of which it can be determined whether a new art, etc., involves invention. It is therefore necessary to look to the common law and to the textbooks for guidance, and these authorities we find to be rather unsatisfactory when defining invention in general terms, or to be restricted to determining the question of invention in reference to the particular case decided. Thus in *Robinson on Patents*¹⁴ we find the following exposition:

³ *In re Weston*, 1901 C. D. 290; *In re Wagner*, 105 O. G. 1783; *Carnegie Steel Co. v. Cambria Steel Co.*, 185 U. S. 403 (1901).

⁴ *Expanded Metal Co. v. General Fireproofing Co.*, 214 U. S. 366 (1908); *Gulf Coal Co. v. Sutton, Steele & Steele*, 35 Fed. (2d) 433 (1929).

⁵ *Conroy v. Penn Electrical Co.*, 155 Fed. 421 (1907); *San Jose Canning Co. v. Oneal*, 10 Fed. (2d) 100 (1926).

⁶ *American Bell Telephone Co. v. Dolbear*, 17 Fed. 604 (1883).

⁷ *In re Talmadge*, 174 O. G. 1219.

⁸ *Bernardini v. Tocci*, 200 Fed. 1022 (1912).

⁹ *American Bed Co. v. Arnaelsteen*, 182 Fed. 324 (1910).

¹⁰ *In re Taylor*, 136 O. G. 1767.

¹¹ *Guthrie v. Curlett*, 10 Fed. (2d) 725 (1926).

¹² *Scovill Mfg. Co. v. Satler*, 21 Fed. (2d) 630 (1927).

¹³ *Flint v. G. R. Leonard & Co.*, 27 Fed. (2d) 215 (1928).

¹⁴ Vol. 1, §§ 77, 78.

"The inventive act in reality consists of two acts; one mental, the conception of an idea; the other manual, the reduction of that idea to practice The mental faculties employed in the inventive act are the *creative* not the imitative faculties. An invention is the product of original thought. It involves the spontaneous conception of some idea not previously present to the mind of the inventor. Industry in exploring the discoveries and acquiring the ideas of others, wise judgment in selecting and combining them, mechanical skill in applying them to practical results; none of these are creation; none of these enter into the inventive act."

The inability of anyone to define invention has even been acknowledged by the Supreme Court when, in the case of *McClain v. Ortmyer*,¹⁵ Justice Brown said:

"The truth is the word (invention) 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 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 palpable something which distinguishes invention from simple mechanical skill. Courts, adopting fixed principles as a guide, have by a process of exclusion determined that certain variations in old devices do or do not involve invention; but whether the variation relied upon in a particular case is anything more than ordinary mechanical skill is a question which cannot be answered by applying the test of any general definition."

Fortunately all of the courts have not spoken of invention in the same manner as Justice Brown did, and we are able to find some decisions in which positive definitions of invention are formulated. Thus in *Eck v. Kutz*,¹⁶ the court said:

"Inventive discovery involves the intelligent apprehension of elements or operations not before recognized by others, although actually existing, followed by the conception of how they can be practically utilized"

And in *Ex parte Champney*¹⁷ it was said:

"Whenever in an art, machine, manufacture, or composition of mat-

¹⁵ 141 U. S. 427 (1891).

¹⁶ 132 Fed. 758, 779 (1904).

¹⁷ 1892 C. D. 176.

ter a change, however apparently minute, is made which is not devious and results in marked advantages, a patentable invention has been produced."

Many other interesting decisions-commenting on invention have been handed down by the courts, a few of which will be quoted:

"The true test of invention is the novelty of the result, and that this result must be criticised by comparing it with the machines, processes or methods known before. The test is an objective one. If the result of an idea in a machine or process involving a new function, or an old function arrived at by new means, the embodiment of the idea is patentable."¹⁸

"But patentable novelty in a case like the present may be founded upon superior efficiency; upon superior durability including the ability to retain a permanent form when exposed to the atmosphere; upon a lesser tendency to breakage and loss; upon purity and, in connection with other things, upon comparative cheapness."¹⁹

"Invention is not always the offspring of genius; more frequently it is the product of plain hard work; not infrequently it arises from accident or carelessness; occasionally it is a happy thought of an ordinary mind; and there have been instances where it is the result of sheer stupidity. It is with the inventive concept, the thing achieved, not with the manner of its achievement or the quality of mind which gave it birth, that the patent law concerns itself."²⁰

"Invention may reside in the conception of the idea for remedying defects, and in the valuable results, even though the means for carrying out the concept be simple and old."²¹

"In every case involving the use of old elements in a new combination the ultimate questions whether invention or mere mechanical skill was involved and whether the transfer of an old device to another art is patentable, are questions of fact; where the substituted device was not found in a closely analogous art, and the new association was of benefit to the art, and utility is admitted by defendant's adoption of it, the change is attributable to invention."²²

In other cases it has been held that invention was involved in the thought of taking advantage of a known quality to

¹⁸ *Hiler Audio Corp. v. General Radio Co.*, 26 Fed. (2d) 475 (1928).

¹⁹ *Union Carbide Co. v. American Carbide Co.*, 181 Fed. 104 (1910).

²⁰ *Radiator Specialty Co. v. Buhot*, 39 Fed. (2d) 373 (1930).

²¹ *Matrix Contrast Co. v. Kellar*, 34 Fed. (2d) 510 (1929).

²² *Kendall v. Trico Products Co.*, 31 Fed. (2d) 522 (1929).

accomplish a new result;²³ in discovering the cause of a defect;²⁴ in making a slight improvement in a crowded art;²⁵ in changing a construction to obtain advantage in operation;²⁶ and in using old principles to simplify a device.²⁷

In an interesting article in the Journal of the Patent Office Society,²⁸ Horace G. Seitz, a patent attorney practicing in New York City, formulated the following definition of invention which he used in determining questions of invention submitted to him:

"Invention consists fundamentally, in the isolation and solution of problems. The *presence* of invention is made evident by the failure of the prior art to present the complete solution of the totality of problems involved. The *measure* of the invention is provided by the character and extent of the problems and the manner of solution.

"Isolation of the problems is a prerequisite to the formulation of the solution or solutions. If the art carries no suggestion of the problems, it carries no solution, and the invention is of basic scope. If it carries a partial solution, the missing problems must be isolated from those solved by the known solution antecedent to development of a solution; and, basically, such solution must deal with both the known and the isolated problems in their relations one to the other, rather than individually.

"If the art fails to suggest any solution—even broadly—of the problems involved, the invention is of basic scope."

The result of considering the authorities on this question is to impress upon the mind three factors which are paramount and largely determinative thereof. The first of these is the novelty of the structure, of the steps of the process, or of the elements and their relative proportions in the composition of matter involved in the *res* considered. In many cases this novelty may be slight and involve but small changes over the prior art, but it is an essential factor in all cases except one, which will be later discussed. The sec-

23 In re Angert, 34 Fed. (2d) 1014 (1929).

24 In re Phair, 384 O. G. 477.

25 Rachlin v. Watsky, 30 Fed. (2d) 225 (1929).

26 D'Olier v. Tohlin, 363 O. G. 453.

27 Star Can Opener Co. v. Owen Dyneto Co., 16 Fed. (2d) 353 (1926).

28 Vol. 1, p. 381.

ond factor is the manner in which the elements of the device coact, or the relation or cooperation of the steps of the process. This second factor is perhaps the most important one because its answer is determinative in more cases than the others, particularly in cases involving machines and processes. The third factor is the result obtained by the new *res*. In most cases these three factors must be considered together, for the old saying that "there is nothing new under the sun" is very appropriate to the question of invention when interpreted to mean that in the natural course of events one thing follows upon and is a mere expansion of another already old. Thus it is generally true that any new device is either a combination or aggregation of old parts or devices, etc., and novelty of structure or *res per se* can hardly be admitted. But if it is shown that a particular device involves a new arrangement of elements structurally considered, and functions in a new way to produce a new result, then it is seen that what at first blush appeared old is in reality new, meritorious and unobvious, and hence involves that "something" which marks invention. The function and method of functioning or co-operation of parts of a device, if novel, thus generally indicate that the device involves invention.

While the three factors set forth above may generally be said to be determinative in any case, there are in addition other rules, and particular applications of the above rules, which the courts and Patent Office have laid down and applied in particular types of cases by means of which it may be judged whether a device differing from prior devices in certain respects, largely structural, involves invention when compared to the prior art relating thereto. One of the most common types of cases to which such rules are directed is that in which the new device is the same, and comprises the same elements as an old device, except for the addition or subtraction of an element. In cases where the new device comprises the mere addition of an element to an old com-

ination, the new element functioning in the combination in the same way that it functions in other uses and without modifying the co-operative relative or function of the elements of the old combination, the device is considered to be a mere extension of an old idea, and it has universally been held that such a device does not involve invention.²⁹ Thus the addition to an old device of a locking mechanism to hold parts in and out of operative position was held devoid of invention;³⁰ the addition of a wedge to tighten a joint was held not to involve invention;³¹ the use of an automatic alarm on an engine-stopping device was denied patentability;³² and the provision of additional holes in a rubber heel lift for attaching purposes was held not to be inventive.³³ However, in cases where the addition of an element in an old combination produces a new cooperation of the elements of the old device, or a different mode of action, with a new and improved result, the device is considered to involve invention. Thus it was held that where a five-section scale for measuring tracks involved more than merely adding a section to a four-section scale, the other devices not being satisfactory, the change amounted to invention.³⁴

Where a new device comprises an old device except for the omission of an essential element thereof, such a device is not patentable if the well known function of the omitted element is also omitted,³⁵ but such a device involves invention if the remaining elements co-operate in a different way or are re-arranged in a manner to produce the same result

²⁹ *Standard Scale Co. v. Computing Scale Co.*, 126 Fed. 639 (1903); *Press Pub. Co., v. Westinghouse Machine Co.*, 135 Fed. 767 (1905); *Volkman v. Truax*, 126 O. G. 2593.

³⁰ *U. S. Peg Wood Co. v. Sturtevant Co.*, 125 Fed. 378 (1903).

³¹ *National Co. v. Interchangeable Co.*, 106 Fed. 693 (1901).

³² *In re Addams*, 111 O. G. 1623.

³³ *In re Tufford*, 315 O. G. 611.

³⁴ *Standard Scales Co. v. Fairbanks & Co.*, 125 Fed. 4 (1903).

³⁵ *In re McElroy*, 161 O. G. 753.

as the old combination.³⁶ It has often been said that to attain simplicity is the highest trait of genius. In *Davis v. Perry*,³⁷ it was held that patentability may be based on simplicity and elimination of parts when the prior art fails to disclose the structure, in view of its utility and success, though the invention is narrow; and in *American School Furniture Co. v. J. M. Sander Co. et al.*,³⁸ that the omission of an element from a combination, and the rearrangement of what remains so as to perform the same function, amounts to invention. But in the case of *In re Thomson*,³⁹ it was held that where the omission of certain elements of a combination merely involved the omission of their well known functions, then only the judgment, selection and adaptation of old machines to particular work, which is expected of those trained in the art, and not invention, was involved.

A second class of cases which is commonly met with is that in which an old device is reconstructed to provide adjustability of parts thereof. Generally speaking, the courts have held that merely to make a thing adjustable does not fall in the range of invention, since any mechanic seeing the desirability of such adjustability could provide it.⁴⁰ Among the numerous cases in which it has been so held are *Union Sewing Machine Co. v. American Raveller Co.*,⁴¹ where it was held that mere adjustability of parts was not sufficient grounds for the issuance of a patent; *Wessel et al. v. United Mattress Machine Co.*,⁴² which held that where it was old to provide for lateral expansion of a mattress stuffing box and a spout therefor, it did not involve invention to pro-

³⁶ *Dececo Co. v. Gilchrist*, 125 Fed. 293 (1903); *Stevens Tool Co. v. Dav-enport et al.*, 134 Fed. 869 (1905); *Hardinge Bros. v. Marr Corp.*, 27 Fed. (2d) 779 (1928).

³⁷ 120 Fed. 941 (1903).

³⁸ 113 Fed. 576 (1902).

³⁹ 118 O. G. 266.

⁴⁰ *Smyth Mfg. Co. v. Sheridan et al.*, 149 Fed. 208 (1906); *Houser et al v. Starr*, 203 Fed. 264 (1913); *Minnesota Paper Co. v. Eibel Process Co.*, 274 Fed. 540 (1921); *In re Scott*, 37 Fed. (2d) 441 (1930).

⁴¹ 119 Fed. 367 (1902).

⁴² 139 Fed. 11 (1905).

vide for vertical adjustability in the same way; and *Ross v. Dowden Mfg. Co.*,⁴³ which held that where adjustability was desired, it did not involve invention to provide it by means of a series of holes in a supporting member which might be engaged by a bolt of the part to be adjusted. In some cases, however, adjustability has been found to be patentable where it caused the machine to operate in a new way or to perform a new function.⁴⁴ Among such cases it has been held that invention was involved in making brackets for supporting swifts adjustable vertically and horizontally in view of advantages secured;⁴⁵ that a new combination of elements permitting a new adjustment and accomplishing a new and useful result was patentable;⁴⁶ and that a machine for making tire-forming material in which one part was adjustable, so that an old device capable of but a single use was made capable of universal use, was patentable.⁴⁷

A third class of cases concerning which the question of invention arises involves devices in which a number of parts or elements, all old, are combined or aggregated, the use of those parts in a device of the character considered being new. This class of case is perhaps the most common of all those to be considered, and involves the question of whether the device is a true and patentable combination of elements or a mere aggregation of elements which is not patentable. A true combination of elements is one in which the elements combined in the machine cooperate with each other to perform a new function in a new way, or where one element acts upon another in the combination to change the mode of operation of that other; in other words the parts coacting in such a manner that their combined product or result is different from that produced by the individual operation of the same elements. On the other hand a device is a mere aggre-

⁴³ 157 Fed. 681 (1907).

⁴⁴ *Rich v. Baldwin*, 133 Fed. 920 (1904).

⁴⁵ *Atwood-Morrison Co. v. Sipp Electric Co.*, 136 Fed. 859 (1905).

⁴⁶ *Louden Co. v. Janesville Tool Co.*, 141 Fed. 975 (1905).

⁴⁷ *In re Morris*, 386 O. G. 485.

gation, and unpatentable, if the elements comprising it each act independently of the others to produce an unrelated series of operations or results such as might be accomplished if each element was separate from the others. Some cases held to involve a true combination are *Steiner v. Schwartz*,⁴⁸ holding that where it was old to provide a doll with mechanism whereby it could walk, and also to provide a doll with mechanism whereby it could sit, the bringing together of these features and adding thereto means whereby the legs were held rigidly perpendicular when walking involved patentable invention; *Oshkosh Matting Co. v. Waite Carpet Co.*,⁴⁹ in which two parts performed separate operations, but the material operated upon coated with these parts to contribute to its movement through the machine from one part to another, it was held that this coaction between the material and parts negated a claim of aggregation; *Concrete Appliances Co. v. Meinken*,⁵⁰ which held that apparatus for elevating and distributing wet concrete to the floors of a building under construction, which in a sense is a unitary work, involved a patentable combination even though it involved successive steps under manual control; and *Line Material Co. v. Brady Mfg. Co.*,⁵¹ which held that a plate, clevis and pin all cooperated to form a support for an insulator permitting the insulator to move into the line of strain to relieve wear, and the device therefore involved a true combination. Cases in which a device has been held to be a mere aggregation are *Goodyear Co. v. Rubber Co.*,⁵² in which it was said that a combination of old elements each performing its appropriate function in the same way was not inventive even though the sum of all the old results made the article more durable; *In re Davenport*,⁵³ in which it was held that

48 148 Fed. 868 (1906).

49 207 Fed. 937 (1913).

50 262 Fed. 958 (1920).

51 7 Fed. (2d) 48 (1925).

52 116 Fed. 363 (1902).

53 110 O. G. 2017.

an article consisting of a catalogue having a desk pad bound thereto to form a cover was an aggregation of unrelated elements; *In re Harris*,⁵⁴ which held that a method of preparing beverages consisting of the steps of preparing, storing and dispensing the beverage was an aggregation; *Campbell v. Mangle*,⁵⁵ which held that taking the two best features from the prior art and combining them into a single device did not constitute invention; *In re Smith*,⁵⁶ which held that merely bringing old devices into juxtaposition and there allowing each to work out its own effect without a novel result was not patentable; and *Muser v. Bell*,⁵⁷ which held that merely making a more conveniently operating mechanism than those preceding did not make an aggregation patentable.

A fourth class of cases concerning which the question of invention must often be determined is one in which the new device or subject matter involves a change in form, size, degree or proportions as compared to previous subject matter of the same character; in other words subject matter in which the originator has merely carried forward an old idea to produce a more efficient construction or one having advantages of refinement. These cases have seldom been held to involve invention. Thus a change of size to adapt a device for use in another art, as from tile making to moulder's core making was held unpatentable;⁵⁸ an article embodying superior workmanship was held to be only an improvement in degree and unpatentable;⁵⁹ carrying forward an old idea by changing the form of an element was held uninventive even though a better result was obtained;⁶⁰ mere strengthening of parts to obtain longer life was held unpatentable;⁶¹

54 170 O. G. 484.

55 194 Fed. 110 (1912).

56 262 Fed. 717 (1920).

57 278 Fed. 904 (1921).

58 *Brown v. Crane Co.*, 125 Fed. 34 (1903).

59 *Edison v. American Mutoscope Co.*, 114 Fed. 926 (1902).

60 *Galvin v. City of Grand Rapids*, 115 Fed. 511 (1902).

61 *Adams Co. v. Schreiber Mfg. Co.*, 111 Fed. 182 (1901).

providing a greater degree of elasticity was held not to involve invention;⁶² a change in mechanical design without accomplishing a new result was held unpatentable;⁶³ making a device arc-shaped to avoid strain was held not to involve invention;⁶⁴ a change in the form of a groove in which a sealing mixture is placed was held unpatentable;⁶⁵ and enlarging a clothes line pulley to make it effective for hauling logs was held to be unpatentable.⁶⁶ There are cases, however, in which a change of degree, etc., has resulted in the production of a new result or a new function, and these cases have been held to involve invention. This is particularly true of chemical patents, where oftentimes a slight change of proportion in the constituents of a formula produce an entirely unexpected result or product. Thus an alloy of 7 per cent tin, 20 per cent lead, and the remainder copper was held to involve invention over an alloy comprising 8 per cent tin, 15 per cent lead, and the remainder copper, where the new composition avoided eutetic alloys and the formation of a homogenous mass;⁶⁷ and the use of a minute quantity, less than 1 per cent, of oil to effect a change in the "type of oiling" which produced results unaccounted for as a mere matter of degree, was held inventive.⁶⁸ Other decisions have held that lessening the weight of a part of a scale which converted a machine from a failure to a success constituted invention;⁶⁹ that raising the breast roll end of a wire in a paper making machine which increased the output of the machine from 450 to 600 feet per minute was new and inventive;⁷⁰ and that longitudinally corrugating a capillary tube to reduce its cross section was invention where the corrugation effected

62 *Waterman Co. v. Johnson*, 123 Fed. 303 (1902).

63 *In re Hill*, 117 O. G. 2365.

64 *Louden Machinery Co. v. Janesville Co.*, 141 Fed. 975 (1905).

65 *In re Williams*, 130 O. G. 1688.

66 *Williamette Works v. Columbia Works*, 252 Fed. 594 (1918).

67 *Ajax Metal Co. v. Brady Brass Co.*, 155 Fed. 409 (1907).

68 *Minerals Separation, Ltd. v. Miami Copper Co.*, 237 Fed. 607 (1916).

69 *Toledo Scale Co. v. Computing Scale Co.*, 208 Fed. 410 (1913).

70 *Eibel Co. v. Minnesota Co.*, 267 Fed. 847 (1920).

cross sectional reduction without disadvantages encountered in cross sectional reduction by other methods.⁷¹

A fifth class of cases involves the change of location or the reversal of parts of an old device. Devices differing from the prior art in this manner are generally held devoid of invention; but if they produce a new mode of action or a new result they are held inventive. The test of invention in these cases was set out in *Mayer v. Mutschler*⁷² to be that whether it is patentable novelty to reposition the old parts of a well-known machine depends on whether the result is new or merely an improvement, and whether the difference obtained is one of kind or degree. Instances where cases of this kind have been deemed uninventive are: *In re Ivan*,⁷³ involving making a handle of a knife for cutting hay reversible on the head of the shank to which the blade is attached; *Redgrave v. Singer*,⁷⁴ involving a change of location of a bagatelle board handle from the end of a block to top and countersinking it; *Union Co. v. Domestic Co.*,⁷⁵ involving shifting the platen of a typewriter toward and away from the type-bar frame where the type-bar frame had previously been shifted relative to the platen; *In re Saunders*,⁷⁶ involving locating a sales station at the rear of a self-serving store; *Wappler Electric Co. v. Bronx Hospital*,⁷⁷ involving repositioning parts to secure compactness without new function; and *In re Hammond*,⁷⁸ involving rotating a shaft with respect to a fixed dial instead of rotating a dial relative to a fixed shaft. Instances in which invention has been held to be involved in such changes are: *Tompkins Co. v. Holden*,⁷⁹ involving repositioning a roll in a paper-making machine to prevent

71 *Schlauch v. Robertson*, 26 Fed. (2d) 681 (1928).

72 248 Fed. 911 (1918).

73 95 O. G. 441.

74 120 Fed. 306 (1902).

75 109 Fed. 85 (1901).

76 383 O. G. 813.

77 28 Fed. (2d) 419 (1928).

78 326 O. G. 684.

79 273 Fed. 424 (1921).

breakage and increase production; *Hoffman Co. v. Larence*,⁸⁰ involving admitting steam through a perforated hinged presser plate rather than through perforations in a bed plate where the change produced new and useful results; and *Diamond Co. v. Brown*,⁸¹ where a substantial and patentable difference was found between means for pressing a saw in a straight line to stationary material, and lifting material of great weight and bulk to a saw.

A sixth class of cases which often arise involve substituting one material for another in an old device. These cases as a rule do not involve invention, but there are exceptions to the rule, and under some conditions the use of certain materials alone, or in combination with others, to produce desired results, may involve invention, even though it involves merely taking advantage of inherent qualities developed or discovered experimentally.⁸² Obviously a change of materials which involves invention often occurs in chemical mixtures and metal alloys. Instances where a change of material has been held to involve invention are: *Allen Filter Co. v. Star Co.*,⁸³ where a refrigerating coil was made of resilient material rather than metal to avoid breakage of the coils; *Dickelman Mfg. Co. v. Lorcher*,⁸⁴ where use was made of a thin sheet metal for the outer wall of a chicken brooder to utilize the extra radiating power of such material over wood, the improvement being revolutionary and contrary to conventional conceptions; *Ludlum Steel Co. v. Terry*,⁸⁵ where a valve was made of an alloy, previously known, where use of the alloy accomplished a hitherto unattained result; *Thomson-Houston Co. v. Lorain Steel Co.*,⁸⁶ where one material when substituted for another successfully overcame

⁸⁰ 202 Fed. 923 (1913).

⁸¹ 130 Fed. 896 (1904).

⁸² *Supra* note 67.

⁸³ 40 Fed. (2d) 252 (1930).

⁸⁴ 4 Pat. Q. 190 (1930).

⁸⁵ 37 Fed. (2d) 153 (1928).

⁸⁶ 117 Fed. 249 (1902).

an obstacle which a number of workers in the field had unsuccessfully attempted to overcome; and *George Frost Co. v. Cohn*,⁸⁷ where the substitution of one material for another was in a relation in which the substituted material had never before been used, and which accomplished new and beneficial results long sought for by those in the art. Instances where substitution of material was denied invention are: *Angier v. Nehring Electrical Works*,⁸⁸ where a package for an automobile tire was formed by a wrapping of crepe where the use of burlap and plain paper was old; *Cahill v. New Orleans Public Service*,⁸⁹ where a steel sealing ring in an electric meter was substituted for a felt ring, to prevent tampering with the recording mechanism; and *Health Products Co. v. Ex-Lax Co.*,⁹⁰ where phenolphthalein was substituted for non-bitter cascara as a laxative in chewing gum.

A seventh type of cases involves the changing of the parts of an old device to divide previously combined or unitary parts, or to make integral, parts previously separate. The case is rare where the bare idea of consolidating several members into one has been held to involve invention;⁹¹ and any new function or effect, where making a thing in one piece that was before made in two, does not give it patentability unless there is evidence of "unexpected properties or uses capable of producing a new result."⁹² Particular cases involving such changes which have been held devoid of invention are: making a broom cap of one flaring piece fastened on one side instead of two pieces fastened on two sides;⁹³ using three castings bolted together instead of one;⁹⁴ making a device in one piece instead of several, and thus

⁸⁷ 119 Fed. 505 (1902).

⁸⁸ 37 Fed. (2d) 953 (1930).

⁸⁹ 35 Fed. (2d) 534 (1929).

⁹⁰ 24 Fed. (2d) 245 (1926).

⁹¹ *Herzog v. Keller Co.*, 234 Fed. 85 (1916).

⁹² *Cordley v. Richardson Corp.*, 278 Fed. 683. (1921).

⁹³ *Lay v. Indianapolis Brush Co.*, 120 Fed. 831 (1903).

⁹⁴ *Stetson v. Herreshoff Mfg. Co.*, 113 Fed. 952 (1902).

cheaper and more durable, but in an expected manner naturally anticipated by the elimination of joints;⁹⁵ building solid what was formerly soldered together;⁹⁶ and combining unit molds into multiple molds, even though necessary to commercial success, was denied invention.⁹⁷ Particular cases involving such changes which have been held patentable are: making teeth supporting ribs integral rather than riveted, where so doing shortened the teeth, reduced breakage, and permitting a larger proportion of the teeth to be used;⁹⁸ and in making the supporting arm of a bracket for a shade roller and the ears for a guide roller of one integral piece.⁹⁹ The last case cited was decided in view of a doctrine announced in the much discussed case of *Davis-Bournonville Co. v. Alexander Milburn Co.*,¹⁰⁰ in which it was said that it is not a rule of general application that there can be no invention in making into two parts what was single, and *vice versa*, and it is often an invention of considerable merit to combine into one what everyone theretofore thought must be two. The instances which the *Davis v. Milburn* case states may involve invention are, of course, those which have the "unexpected properties," etc., set forth above.

An eighth class of cases concerning which the question of invention often arises is one in which an old device or process is employed in a double or analogous use. This is the only class of case in which novelty of construction of the *res* is not involved. In such cases the manner in which the device operates in its new use, that is, the proximate function of its actuating mechanism, must be considered; and if similar in the new device to that of the old device, it is unpatentable. Thus under this rule a device for simultaneously

⁹⁵ *General Electric Co. v. Yost Co.*, 139 Fed. 568 (1905).

⁹⁶ *Lawson v. Metal Products Co.*, 209 Fed. 51 (1913).

⁹⁷ *I. T. S. Rubber Co. v. Panther Co.*, 253 Fed. 63 (1918).

⁹⁸ *Vanderhoef v. Johnson*, 233 O. G. 1403.

⁹⁹ *In re Daniel*, 34 Fed. (2d) 995 (1929).

¹⁰⁰ 297 Fed. 846 (1924).

operating a plurality of tuning elements in a radio apparatus was held to be anticipated and unpatentable in view of a device for operating a churn or a printing press.¹⁰¹ In another recent case involving the question whether the art of stopping leaks in automobile radiators was analogous to and unpatentable over the art of stopping leaks in tires, the court held that the problems arising from difference in place and structure of the leaking article and the means and methods of solving said problems had to be considered and compared, and that when so considered the art of stopping radiator leaks was patentable over the art of stopping tire leaks.¹⁰² The problems solved and the method of their solution by devices employed in different arts, must therefore determine the patentability of one device over another in a different art. Illustrations of unpatentable analogous arts are: a machine for finishing concrete pavements was held anticipated by a machine comprising the same combination of elements and used in a turret lathe;¹⁰³ a seal against back pressure used in a metallurgical liquid fuel furnace was held anticipated by a seal used in liquid fuel furnaces generally;¹⁰⁴ a disc plow was held to anticipate a disc cultivator, plowing and cultivating being analogous arts;¹⁰⁵ and weaving a fabric from reed strands in a way familiar in weaving other fabrics was held not inventive.¹⁰⁶ Illustrations of similar devices in non-analogous arts, and therefore patentable, are: a frozen confection on a stick was held inventive over a lollipop and over a block of ice frozen to a metal handle;¹⁰⁷ a rotary drier for paper making machines was held non-analogous to steam turbines and refrigerating ap-

¹⁰¹ *In re Asbury*, 5 Pat. Q. 120 (1930).

¹⁰² *Radiator Specialty Co. v. Buhot*, 39 Fed. (2d) 373 (1930).

¹⁰³ *In re Robb*, 5 Pat. Q. 484 (1930).

¹⁰⁴ *In re Meinkoff*, 3 Pat. Q. 306 (1929).

¹⁰⁵ *Linville v. Milberger*, 34 Fed. (2d) 386 (1929).

¹⁰⁶ *In re Lloyd*, 30 Fed. (2d) 1006 (1929).

¹⁰⁷ *Popsicle Corp. v. Weiss*, 40 Fed. (2d) 301 (1930).

paratus;¹⁰⁸ and applying a principle employed in a waffle iron to an electric toaster was held inventive.¹⁰⁹ It is often quite difficult to reconcile the decisions involving double or analogous use, some admitting and others denying invention, since apparently the same factors leading to a decision in one case are lightly held in another; but, considered generally, the trend seems to be to show more liberality in favor of invention at the present time than formerly.

A ninth class of cases concerning which the question of invention arises is one in which a new device involves a multiplication or duplication of features old in the art to which the device relates. Such a mere duplication of parts is not patentable.¹¹⁰ Instances in which invention has been denied in cases of this character are: placing a tab on the bottom and top edges of an index card, where a tab had been previously applied only at the top edge;¹¹¹ making two vertical rows of retorts empty into a common standpipe where it was known that a series of retorts could be emptied into a common standpipe;¹¹² and duplicating the inidirectional entrance of a sales section to allow two lines of customers to enter at one time instead of one line as previously.¹¹³ There have been a few cases where such changes have been held patentable, however. Thus it has been held that duplication amounted to invention where it produced a new unitary additional result, and not duplication of product or function;¹¹⁴ and that provision of two cranes with a boring machine to enable new work to be hoisted to position simultaneously with the removal of the completed piece, where only one crane was shown by the prior art, was patentable.¹¹⁵ The test of patentability in cases of this type

108 *Berry v. Robertson*, 40 Fed. (2d) 915 (1930).

109 *Economy Appliance Co. v. Fitzgerald Co.*, 35 Fed. (2d) 756 (1928).

110 *Burnham et al. v. Union Mfg. Co.*, 110 Fed. 765 (1901).

111 *Library Bureau v. Macey Co.*, 148 Fed. 380 (1906).

112 *Riter-Conley Co. v. Atlanta Gaslight Co.*, 234 Fed. 896 (1916).

113 *In re Saunders*, 383 O. G. 813.

114 *Goss Printing Press Co. v. Scott*, 108 Fed. 253 (1901).

115 *In re Sears*, 148 O. G. 279.

is substantially the same as that applied to determine the question of true combinations as opposed to aggregations, and requires that some new, different and unexpected result follow from the duplication of old elements.

Devices which comprise a combination of elements in which all the elements are old in a prior device except for one or more elements which are substituted for elements in the old combinations, present a tenth type of cases concerning which the question of invention is frequently raised. The general rule applied to this class of cases is that the substitution of a new element for an old element in a combination does not make the combination patentable where the new element is differently constructed, but performs the same function as the substituted element, and the new combination functions in the same manner to produce the same result as the old combination. The leading case on this subject is *In re McNeil*,¹¹⁶ decided by the Court of Appeals of the District of Columbia, and involved a sewing machine in which a particular type of stitch-former was employed; one claim of the application reading:

"In a sewing machine, the combination with stitch-forming mechanism, including devices for forming two rows of irregular stitches, the adjacent loops of which are interlocked, of a trimmer arranged in advance in the stitch-forming mechanism and in the line of the same, substantially as described."

The Court denied patentability in the following words:

"Borton and Wilcox having invented the combination of a trimmer with a stitch-forming mechanism, it is not invention to combine a trimmer with another stitch-forming mechanism whether the stitch-forming mechanism be new or old. No new result is accomplished by appellant which differs in kind from the result accomplished by Borton and Wilcox. There is no special coaction between the particular stitch-forming mechanism and the trimmer. Each acts in its own way and is not affected by the other and performs its function in the combination irrespective of the other. I think that what the appellant has done is within the province of a mechanic and does not amount to invention."

116 1902 C. D. 563.

The same rule applies whether the new element added to the old combination be new *per se* or not; and if it is new *per se* it must be claimed separately and apart from the old combination. Combinations which have been held to involve the mere substitution of equivalents are: the substitution of a leather washer for a metal washer in a tool-retaining coupling;¹¹⁷ the substitution of a tractor drive for a steam or gasoline engine in a stump pulling machine;¹¹⁸ the substitution of a caterpillar tractor for horses as a motive power for a snow plow;¹¹⁹ the substitution of a better strainer for a metal wool strainer in an oil purifying device;¹²⁰ the substitution of electrical solenoids for rotating cams in a valve-operating device;¹²¹ and the substitution of a cutting stylus for a pressure stylus in a record-forming device.¹²² Instances in which a change in the construction of an old device or combination by changing an element thereof have been held patentable and not merely the substitution of an equivalent are: the substitution of a belt-drive for an overrunning clutch in a self-starter for automobiles;¹²³ the substitution of an air lift pump for a sucker-rod pump in a combination for fusing sulphur underground and raising it to the surface;¹²⁴ the substitution of a solid arm with fixed end centers for a slotted bar or free link involving an apparently simple change, where the change involved a reorganization of the elements functioning in an improved manner;¹²⁵ the substitution of one form of clutch for another for locking the adjusting screw of a micrometer gauge to lock the spindle securely without disturbing its minute adjustment;¹²⁶ the sub-

117 In re Stevens, 36 Fed. (2d) 296 (1929).

118 Huston Mfg. Co. v. Clyde Iron Co., 32 Fed. (2d) 558 (1929).

119 Northern Trailer Co. v. La Plant, 21 Fed. (2d) 686 (1927).

120 In re Sweetland, 12 Fed. (2d) 163 (1926).

121 In re Bowers, 321 O. G. 215.

122 In re Hawley, 117 O. G. 2364.

123 In re Huff, 259 O. G. 386.

124 Union Sulphur Co. v. Freeport Texas Co., 251 Fed. 634 (1918).

125 Troy Carriage Co. v. Kinsey Co., 247 Fed. 672 (1917).

126 Brown & Sharpe Co. v. Starrett Co., 225 Fed. 993 (1912).

stitution of a chambered block or valve for two poppet valves in a mechanism for playing musical instruments where this one light valve was easily workable by suction and quickly responsive in light motors;¹²⁷ and substituting a split-phase alternating current for two or more independently generated currents.¹²⁸

In addition to the rules relating to the different types of cases in which the new device bears somewhat of a structural relationship to the prior art, there are certain auxiliary rules or criteria of invention which may be determinative and applicable in cases where there is doubt of the existence of invention as measured by the foregoing rules. These rules or criteria, considered alone, are not decisive in any case, but have often been held important in deciding close questions, as where the novelty of the device in question was slight and of doubtful invention.

One of these auxiliary rules is that where the question of invention is doubtful the fact that the device is of superior utility, or that it is the first to successfully perform a useful function, may be sufficient to turn the scale in favor of invention and the validity of a patent therefor.¹²⁹ In *Imperial Bottle Cap Co. v. Crown Cork Co.*¹³⁰ it was said that where there is an actual and admitted improvement in a combination of old elements, and its utility is shown in a marked degree, there should be controlling reasons to rebut the presumption that there is a sufficiency of invention to support a patent. And in *Burdon Wire Co. v. Williams*,¹³¹ it was said that while the utility of a device cannot prove that it is a patentable invention, it is entitled to weight when the question is doubtful. A particular instance wherein utility is largely determinative in favor of invention is where the

¹²⁷ *Aeolian Co. v. Piano Co.*, 134 Fed. 872 (1905).

¹²⁸ *Westinghouse Mfg. Co. v. Roberts*, 125 Fed. 6 (1903).

¹²⁹ *Sperry Mfg. Co. v. Owens Co.*, 111 Fed. 388 (1901).

¹³⁰ 139 Fed. 312 (1905).

¹³¹ 128 Fed. 927 (1904).

change in the new device over old devices is small, but is the thing which gives the device utility or makes it operative.¹³²

The fact that there existed a mechanical requirement for a machine to do a certain thing for a long time, which was first supplied by an inventor with a given machine, is another factor which has often been held to evidence invention in that machine.¹³³ Thus in *Todd Protectograph Co. v. Safe-Guard Check Writer Co.*,¹³⁴ it was held that the history of the art is a safer test of the exercise of the inventive faculties than is mere speculation, *a priori*, as to what new steps are within the imagination of the ordinary journeyman; and if, after numerous efforts, a need of long standing is successfully met, it is a mistake to suppose that the answer was all along apparent. In *Blake Automotive Co. v. Cross Mfg. Co.*,¹³⁵ it was held that a device which has gone into extensive use and met great favor with the public is not anticipated by a patent disclosing a different construction and which had been in existence for thirteen years, during which time the best device was diligently sought. And in *Brogdex Co. v. American Fruit Growers*,¹³⁶ it was held that evidence that a remedy to prevent blue mold decay in fresh fruits was sought for twenty-five years prior to the discovery of the patentee, was proof of invention, although "viewed retrospectively and ignoring the long unsuccessful search for a remedy, the claimed process would seem to be wanting in invention." The case last cited is now under consideration by the Supreme Court, and it will be of interest to note whether the decision quoted favoring invention is affirmed; the patent being based on very slight novelty but being of a scope dominating the entire citrus fruit industry. The de-

¹³² *Atlantic & Pacific Co. v. Wood*, 288 Fed. 148 (1923).

¹³³ *Maunula v. Sunell*, 155 Fed. 535 (1907).

¹³⁴ 291 Fed. 613 (1923).

¹³⁵ 13 Fed. (2d) 30 (1926).

¹³⁶ 35 Fed. (2d) 106 (1929).

cision of the Supreme Court in this case will probably have an important bearing upon the consideration to be given evidence of satisfaction of a long felt want in determining the question of invention.

Somewhat akin to evidence of satisfaction of a long felt want as evidence of invention is evidence that others had sought and failed to produce a device to accomplish a certain purpose.¹³⁷ Thus it was held in *Hale & Kilburn Co. v. Oneonta Ry. Co.*¹³⁸ that where many have struggled for years to accomplish a result without avail, it combats the contention that there is no invention. Other cases holding to the same effect are *Hallock v. Davidson*¹³⁹ and *American Fruit Growers Co. v. Brogdex Co.*¹⁴⁰

The commercial success with which a new device has met has sometimes been held to evidence invention in cases of doubt.¹⁴¹ Thus it was held that the conjunction of true mechanical combination, novelty, great utility and notable commercial success in a very ancient art is persuasive that more than mechanical skill is involved in a device.¹⁴² In *Ferry v. Waring Hat Co.*¹⁴³ it was held that where a patented device proved exceptionally successful commercially, produced a marked saving in the cost of manufacture and in the amount of waste, and resulted in an enlarged output, it involved invention even though the improvement seemed trivial. Again it was held that extensive use of a device, not merely due to advertising, and the fact that defendants themselves abandoned a previously used device and adopted the patented one, evidenced invention.¹⁴⁴ The factor of imi-

¹³⁷ *Hanifen v. Armitage*, 117 Fed. 845 (1902).

¹³⁸ 124 Fed. 514 (1903).

¹³⁹ 107 Fed. 482 (1901).

¹⁴⁰ 35 Fed. (2d) 106 (1929).

¹⁴¹ *Boyer v. Keller Tool Co.*, 127 Fed. 130 (1903); *In re Thomson*, 118 O. G. 266; *Kohler v. Smith*, 326 O. G. 895; *Crozier-Straub v. Reiter*, 34 Fed. (2d) 577 (1929).

¹⁴² *Regent Mfg. Co. v. Penn Electrical Co.*, 121 Fed. 80 (1902).

¹⁴³ 129 Fed. 389 (1900).

¹⁴⁴ *Peters v. Union Biscuit Co.*, 120 Fed. 679 (1903).

tation or universal adoption by competitors is strong evidence of patentable invention.¹⁴⁵

In another important line of cases it has been held that a simple device or improvement may involve patentable invention where it converts failure into success or accomplishes what others tried to accomplish and failed.¹⁴⁶ The very simplicity of the device thus sometimes becomes the factor determinative of invention on the ground that the simplicity illustrates the elusiveness of the solution to others previously engaged in an attempt to solve the problem.¹⁴⁷ Other cases have held that small changes in a new device over the prior art by which the new device remedies former defects and supplies a need;¹⁴⁸ or results in a saving of time, material and the use of skilled labor to produce a better and cheaper article;¹⁴⁹ or where it is favorably received and recognized by the art and there is a great demand for it;¹⁵⁰ are inventive. And in *Star Brass Works v. General Electric Co.*¹⁵¹ it was held that the change involved in a new device "seems simple enough now but it was the first to combine comprehension of the problem to be solved with a practical arrangement of parts for its solution." The same thought that simplicity of solution of a problem after disclosure does not negative invention, where the solution was long sought by the art, has often been expressed by the courts and will easily be recognized as equitable and correct.

*"The invention all admired; and each how he
To be the inventor missed, so easy it seemed,
Once found, which yet unfound most would have thought
Impossible!"*
—Milton.

SOUTH BEND, INDIANA

Eugene C. Knoblock.

¹⁴⁵ *Carson v. American Smelting Co.*, 4 Fed. (2d) 463 (1925).

¹⁴⁶ *Hall Signal Co. v. General Signal Co.*, 168 Fed. 62 (1908).

¹⁴⁷ *Theroz v. U. S. Chemical Co.*, 14 Fed. (2d) 629 (1926).

¹⁴⁸ *Hutter v. Bottle Stopper Co.*, 128 Fed. 283 (1904).

¹⁴⁹ *General Electric Co. v. Hill-Wright Co.*, 174 Fed. 996 (1909).

¹⁵⁰ *Globe Knitting Works v. Segal*, 248 Fed. 495 (1917); *Buchanan v. Perkins Electric Switch Co.*, 135 Fed. 90 (1905).

¹⁵¹ 111 Fed. 398 (1901).