STRAUSS *v.* KING, 18 BLATCH. 88.

S. D. OF N. Y., 1880. BLATCHFORD, J.

Davis, Strauss, & Co.'s reissued patent of March 16, 1875, for an "improvement in pantaloons."

The specification: —

"My invention relates to a fastening for pocket-openings, whereby the sewed seams are prevented from ripping or starting from frequent pressure or strain thereon; and it consists in the employment of a metal rivet or eyelet at each edge of the pocket-opening, to prevent the ripping of the seam at those points. The rivet or eyelet is so fastened in the seam as to bind the two parts of cloth which the seam unites together, so that it shall prevent the strain or pressure from coming upon the thread with which the seam is sewed. . . . I am aware that rivets have been used for securing seams in shoes, . . . and hence I do not claim broadly fastening of seams by means of rivets."

The claim was: —

"As a new article of manufacture, pantaloons or other garments having their pocket-openings secured at the edges by means of rivets or their equivalents, substantially," &c.

The objections to the patentability of this improvement were thus stated and met by the court: —

"On the point that there is no invention in the thing patented, the defendants contend that the want of patentability consists in the fact that the invention is nothing more than the employment at the corners of a pocket-opening of the old and well-known rivet, and that no new function is performed by the rivet in that place from what is performed by it in any other place. The invention is claimed as an improvement in the pocket-opening of a garment which has a pocket-opening. It does not extend to anything but a pocket-opening. It requires that the seam which unites two pieces of cloth laterally shall terminate at the commencement of the pocket-opening; that such seam shall be made by means of sewing the two pieces of cloth together laterally by thread; that the rivet shall be of metal; that it shall be placed in the seam at the edge of the pocket-opening, — that is, where the seam ends and the pocket-opening begins, but still in the seam; that it shall be so located and fastened with reference to the two lateral pieces of cloth which the seam unites as to bind together such two lateral pieces of cloth by pressing tightly upon both of them; that this shall be

effected by putting the rivet through a hole and heading it down on both of the two opposite faces where the hole begins and ends; that the operation of the rivet when so set shall be to receive the strain which results from pressure from within on the edge or end of the pocket-opening, and keep such strain from coming on the thread of the seam, and thus protect such thread from ripping or starting and allowing the seam to open; and that the practical advantages of the arrangement shall be to get rid of the frequent renewal by sewing of the thread in the seam at the edge of the opening.

"In view of the testimony as to the state of the art, and prior to the invention of Davis, all the foregoing features are involved in such invention. They all appear on the face of the specification of the patent, and are embraced in the claim. They amount to invention, and they embody patentability. The result of them was new and useful. The case is not one of mere double use, or of the use of an old rivet in a new place. It is not merely the usual through and through binding or uniting function of the rivet that is availed of.[1]

"It is argued for the defendants that there is no combination between the rivet and the sewed seam, but a mere aggregation; that the claim is not confined to the application of a rivet to a sewed seam; that a stay of sewed thread is the equivalent of a rivet; that in view of the prior use of a stay of sewed thread at the corner of a pocket-opening, there was no invention in the change to a metal rivet; and that a button had before been sewed on with thread at the upper end of the seam, at the edge of the pocket-opening, to prevent the thread of the seam from being worn away, and the seam had been stayed by sewing in leather or other fabric; and there was no invention in passing from these arrangements to Davis's. It is sufficient to say that there is no force in any of these suggestions as against the validity of the patent;

[1] The learned judge sets out in great detail the exact application and working of the plaintiff's device; but after all is said and done, was it anything more than using a rivet in a new place? And the function of the rivet being merely to hold fast, does it require invention to perceive that a rivet which holds fast in one place will do so in another? If it is known to bind two pieces of leather, for instance, is not the inference that it will bind two pieces of cloth an obvious one? It may be that in the case of the pantaloons there was this new circumstance, — namely, that the pressure which the rivet resisted was, as regards the cloth, a lateral pressure; that is, a pressure which would tend to separate the two pieces of cloth, not by pulling them apart, but by bearing down on the point of contact, and so severing them. But this, if it was a new circumstance in the use of rivets, was a very slight one. It did not affect the operation of the rivet, or call for any change in the mode of its application, — certainly for no change that mechanical skill would not effect.

nor is it shown that the invention as before defined was known or in use before it was made by Davis.

QUIROLO *v.* ARDITO, 17 BLATCH. 400.

S. D. OF N. Y., 1880. WHEELER, J.

It is no invention to mount stereoscopes upon a stand such as has been used before for surveyors' compasses, theodolites, telescopes, &c.

FAULKS *v.* KAMP, 17 BLATCH. 432.

S. D. OF N. Y., 1880. WHEELER, J.

Charles Brown's patent of Aug. 27, 1867, No. 68,282, for baling short hay.

Its validity doubted, but not determined, the court saying: —

"There is considerable doubt whether the patent, as between the owners and the public generally, is of any validity. Hay has long been baled, to the common knowledge of all. The whole invention in controversy consists in baling hay cut short in the same manner. The well-known process of baling hay was applied to another kind of hay. The short-cut hay was well known before, and the process made no change in its properties or quality. When baled, it could be more conveniently handled, as common hay could be. Langdon *v.* De Groot, 1 Paine, 203; Alcott *v.* Young, 16 Blatch. 134."

THE AMERICAN WHIP CO. *v.* THE HAMPDEN WHIP CO., 1 FED. REP. 87.

D. OF MASS., 1880. LOWELL, J.

C. R. Shelton's reissued patent, No. 7382, for an improvement in whip-tips.

Lowell, J.: —

"The specification represents that driving-whips, especially long whips without a lash, are expensive, and frequently broken or frayed out at the tip end, and that several inconvenient and imperfect devices have been resorted to for repairing them.

"The patented improvement is to make a whip-tip independent of the stock, and providing it with a socket which may be fitted to the stock. The particular mode described, which is mentioned as one of many possible modes, is to make a screw-thread on the inside of the socket of the tip, whereby the tip can be readily screwed upon the stock, and again removed at pleasure.

"The first claim is: 'As a new article of manufacture, a whip-tip provided with a socket, so as to be attached to the stock proper, as and for the purpose set forth.'

". . . It is in evidence, and is well known, that fishing-rods had been made in sections before the invention of Shelton, and the tips of these rods were so made with sockets as to be fitted to or removed from the next joint, at pleasure. These sockets were not usually fastened with a screw-thread, and I doubt if any were so fastened in the mode of the patent before its date. The joints which came together were so nicely fitted by their ferrules that they were held for a practically useful purpose by adhesion or friction.

"Before the date of the patent, whips had been made in sections by a travelling agent, not, however, for sale in that form, but for convenience of packing in a trunk. The plaintiffs' expert testifies that a sample of these sectional whips would not work well, because the parts were so loosely united that the tip would come off when a smart blow was struck. This is a matter of adjustment. There can be no doubt, I suppose, that a whip-tip might be united to the stock in a useful way, after the old fashion of the fishing-rod. These being the facts, although the merits of the adoption of this form of manufacture in the trade are great, I feel constrained by the authorities to hold that the patent is for little more than the application of an old art to a new use, analogous to that of making fishing-rods. To sustain the patent, therefore, it must be confined to the particular improvement of the screw-thread; and so construed, I do not find it infringed by the defendants."

TINKER *v.* WILBER EUREKA MOWER & REAPER MANUFACTURING CO., 1 Fed. Rep. 138.

S. D. of N. Y., 1880. Wheeler, J.

J. B. Tinker's patent, No. 51,364, dated Dec. 5, 1865, for an improvement in mowing-machines.

The court: —

"There is no doubt but that, as argued for the orator, the patent would give an exclusive right to the patented invention for all uses to

which it could be put, whether contemplated by the inventor, or discovered by himself or others afterwards. Roberts *v.* Ryer, 91 U. S. 150. But the invention must in some way be covered by the patent before he can acquire an exclusive right to it for any purpose.

"Although Tinker constructed rollers in advance of the shoes, so they would roll down the grass, and without anything before them that would divide the grass and prevent it being rolled, he does not appear to have apprehended what their utility would be in preventing tangling of the grass over the parts of the machine next to the grass left uncut, [*sic*] to their hindrance, nor to have obtained a patent for that device. The use of such rollers is what the orator complains of; but the patent she owns does not appear to cover them, therefore the defendant does not appear to infringe her patent as it was granted."

PROCTOR *v.* BRILL, 4 FED. REP. p. 419.

E. D. OF PENN., 1880. BUTLER, J.

If a certain device for sustaining the pole of a horse-car, so that its weight should not bear upon the horses' necks, had previously been used on "carriages or wagons," "the application of such old device to a street-car is not patentable."

AMERICAN WHIP CO. *v.* HAMPDEN WHIP CO., 4 FED. REP. 536.

D. OF MASS., 1880. LOWELL, J.

D. C. Hull's reissued patent, No. 5651, dated Nov. 11, 1873, for an improvement in the mode of making whip-stocks.

In turning the legs of chairs, &c., it had been the practice to leave a "stump-shod" or piece to be cut off; this method applied to whip-stocks, in combination, was held patentable with some hesitation, Lowell, J., saying: —

"I think, upon the whole, it may be supported as being something more than the new application of an old method. The invention does not consist either in making a 'stump-shod,' or in sawing it off, but in combining the metallic load-piece of a whip-stock with the stump-shod in such a way that the stump-shod may be sawed off."

KNOX *v.* QUICKSILVER MINING CO., 4 Fed. Rep. 809.

D. of Cal., 1880. Field, J.

A device in common use for limekiln furnaces is not patentable for use in a quicksilver furnace.

MOFFITT *v.* ROGERS, 8 Fed. Rep. 147.

D. of Mass., 1881. Lowell, J.

J. R. Moffitt's patent, No. 178,809, granted June 20, 1876, for a process of making counter stiffeners for boots and shoes, and for the machine employed to make them.

The specification said: —

"My invention relates to the shaping of the counter from the blank; and consists, primarily, in using a double process for effecting this, as will be more fully explained hereafter, — the first process consisting in shaping them by means of a former moving upon an axis, and suitable means for holding the blank up to the former; and the second process consisting in moulding the counter so formed over a male mould of the desired form. By this double process a counter is formed which suits the wants of the consumer much better than any other known to me."

Lowell, J., said: —

". . . The defendants . . . do not use the specific improvements in machinery described in patent No. 178,869, but they do use the process of the first claim [the claim is not given in the report]. As I intimated at the hearing, I am not aware that a patent has ever been sustained for a process or method which consisted of employing an old machine for the very purpose for which it was made.

"If any person discovers how to use an old machine to the best advantage, he is only a skilful workman, not an inventor. The plaintiff undertakes to prevent the owners of a machine made for moulding counters from using it to finish counters already begun upon another old machine for making counters. He might as well, in my opinion, claim a patent for passing a counter twice through the same machine.

"I do not mean to say that a patent cannot possibly be supported for a process or method which consists only of applying an old machine to a new use. Many of the ablest writers and jurists assert that such a claim is possible. I have never seen a case in which a patent of this

sort has been sustained,[1] and there are some in which it has been rejected. If one is ever supported, it will be when the new use is so remote from the old use that a court or jury can say that a new idea has been discovered. In the case of Brook *v.* Aston (8 E. & B. 478, affirmed 32 L. T. Rep. 341), the patentee applied to fibres of wool and hair a process which had been before used for burnishing threads of cotton and linen; but it was held, as matter of law, to be a mere double use, and the court refused to leave to the jury the question whether a new result was obtained. Certainly hair is less like cotton than a counter-blank partly made into a counter is to the counter-blank."

WESTERN ELECTRIC MANUFACTURING CO. *v.* ANSONIA BRASS & COPPER CO., 9 FED. REP. 706.

D. OF CONN., 1881. SHIPMAN, J.

Two reissued patents, dated Feb. 29, 1876, numbered respectively 6954 and 6955, for "improvements in insulating telegraph wires,"— the first for a process, the second for its product.

The specification ran as follows: —

"The method of insulating now in use consists in braiding over the wire a fibrous covering, after which it is dipped in wax, for the purpose of filling and closing its pores, and, after a subsequent scraping to remove the surplus wax, it is ready for use.

"This method is, however, objectionable, inasmuch as it leaves the covering in a very rough and soft condition, and fails to secure perfect insulation. In my improved method, after the wire has received its coating I dip it in paraffine or wax, after which, instead of scraping off the surplus coating, I pass the whole through a suitable machine, which compresses the covering, and forces the paraffine or wax into the pores, and secures perfect insulation. By so compressing the covering, the paraffine or wax is forced into the pores, and the surface becomes and appears polished. Wire insulated in this manner is entirely impervious to the atmosphere, of greater durability, and less cumbersome than any heretofore made."

The claim of the process patent was for

"the method of insulating telegraph wire by first filling the pores of the covering and subsequently compressing this covering, and thereby polishing its surface, substantially as specified."

[1] *Vide ante*, page 291.

The claim of the product patent was for

"an insulated telegraph wire, the covering of which has its pores filled and its surface polished, substantially as described."

"The defect in the article coated with uncompressed paraffine," said Judge Shipman, "was a leakage of electricity, which was probably owing to the shrinkage of the paraffine in the interstices of the fibrous covering while the melted paraffine was cooling. The paraffine which was compressed while in a plastic state was thereby forced into the interstices of the fibres, and the defect was obviated."

The invention or discovery was of the fact that compressing paraffine is a superior way of causing it to fill all the pores of the fibrous covering. Both paraffine, as applied to the fibrous covering of the wire, and the mechanism by which the patentee compressed it, were old. Moreover, this same process of compression had been applied to cloth coated with bitumen or fatty substances, as a covering for telegraph wire. Its use to compress paraffine for the same purpose was therefore a double use, which is not patentable; and the court so held, concluding thus: —

"The old process was applied to the new use without substantial alteration or change. The process patent not stating a patentable invention, the product patent is in no better condition."

ENGLISH CASES.

BRUNTON *v.* HAWKES, 4 B & Ald. 541.

King's Bench, 1820.

T. Brunton's patent of March 26, 1813, for "improvements in the manufacture of ships' anchors, windlasses, and chain cables." There were two improvements, one in chain cables, one in the anchor.

"As to the first invention, chain cables had been formerly made with twisted links, a wrought-iron stay being fixed across the middle of the opening of each link to keep it from collapsing. The alleged improvement consisted in making the links with straight sides and circular ends, and in substituting a cast-iron stay with broad ends adapted to the sides of the link and embracing them. This combination of the

link and the stay was calculated to sustain pressure better than the old form;"[1]

and the court intimated that it was patentable, but they held the whole patent void because the other improvement which it claimed — that of the anchor — was a mere double use. This we shall consider presently.

Of the cable, Bayley, J., said: —

"The improvement in that respect, as it seems to me, is shortly this: so to apply the link to the force to operate on it, that that force shall operate in one place, namely, at the end; and this is produced by having a bar across, which has not the defect of the bar formerly used for similar purposes. The former bars weakened the link, and they were weak themselves, and liable to break, and then if they broke, there might be a pressure in some other part. Now, from having a broad-ended bar instead of a conical one, and having it to lap round the link instead of perforating it, that inconvenience would be avoided; and, therefore, the present impression on my mind as to this part of the case is that the patent might be supported."

The anchor. Formerly, each arm of a ship's anchor was welded to the shank separately. In the plaintiff's anchor,[2] "the two arms were formed in one piece, having a conical opening in the centre, through which the shank was passed, the coned end of the shank being welded to the arm-piece. The patentee relied for strength on the impossibility of drawing a thick conical piece of iron through the smaller aperture of a conical opening into which it was fitted." Moreover, injury to the iron from repeated heating was avoided, only one heating being necessary to unite the end of the shank perfectly with the side of the conical hole. But it was proved that the same form of construction had been employed before in what were called *adze* or *mushroom*[3] anchors, which were used for mooring stationary vessels

[1] We take this lucid description from Curtis on Patents, § 37.

[2] We quote from Goodeve's Abstract of Patent Cases, page 61.

[3] The only further description of these anchors contained in the report is in the argument for the plaintiff. It is as follows: —

"The mode pointed out in the specification has never before been applied to the manufacturing of ships' anchors. It is true that it has been applied to that which, from the poverty of language, is embraced under the same generic word, namely, a mushroom-anchor. That, however, is never taken on board a ship, but is deposited. A quantity of sand is thrown on it, and it then becomes fixed to the spot, and, though called an anchor, is in fact a submarine post."

only, such as lightships. And the same mode of uniting flukes and shank was employed in common hammers and pickaxes.

Abbott, C. J.: —

". . . It appeared in evidence . . . that the mode of making cables and anchors, introduced by the plaintiff into general use, was highly beneficial to his Majesty's subjects, and I should wish that he who introduced it might be entitled to sustain the patent. . . . The mode of joining the shank to the flukes of the anchor is to put the end of the shank, which is in the form of a solid cylinder, through the hollow and conical aperture, and it is then made to fill up the hollow, and to unite itself with it. Now that is precisely the mode by which the shank of the mushroom-anchor is united to the mushroom top, — by which the shank of the adze-anchor is united to its other parts. It is, indeed, the mode by which the different parts of the common hammer and the pickaxe also are united together.

" Now, a patent for a machine, each part of which was in use before, but in which the combination of the different parts is new, and a new result produced, is good, because there is a novelty in the combination. But here the case is perfectly different. Formerly three pieces were united together; the plaintiff only unites two; and if the union of those two had been effected in a mode unknown before, as applied in any degree to similar purposes, I should have thought it a good ground for a patent; but, unfortunately, the mode was well known and long practised. I think that a man cannot be entitled to a patent for uniting two things instead of three, where that union is effected in a mode well known and long practised for a similar purpose."

Bayley, J.: —

" Could there be a patent for making in one entire piece what before had been made in two pieces? I think not; but if it could, I think that still this would not be new.

" In the mushroom and the adze anchors, the shank is introduced into the anchor by a hole in the centre of the solid piece; and in reality the adze-anchor is an anchor with one fluke, and the double-fluke anchor is an anchor with two flukes. After having had a one-fluked anchor, could you have a patent for a double-fluked anchor? I doubt it very much. After the analogies alluded to in argument, of the hammer and pickaxe, I do not think that the mere introducing the shank of the anchor, which I may call the handle, in so similar a mode, is an invention for which a patent can be sustained. It is said in this case that the mushroom-anchor and adze-anchor are not ships' anchors, but mooring anchors.

"I think they are ships' anchors. They are not indeed such anchors as ships carry with them, for the purpose of bringing the ship up; but if the ship is required to be stationary at a particular place, then the common mode of making it stationary is by the mushroom-anchor. So the mode adopted to bring a ship containing a floating light to an anchor is by mooring her to one of these mushroom-anchors. That is the description of anchor for a holdfast to the ship. The analogy between the case of the mushroom-anchor and of the adze-anchor is so close to that of the present anchor, that it does not appear to me that this discovery can be considered so far new as to be the proper ground of a patent. In reality, it is nothing more than making in one piece what before was made in two, and introducing into this kind of anchor the shank in the way a handle is introduced into a hammer or pick-axe."

HALL *v.* BOOT (OR JARVIS), WEB. 100.

K. B., 1822. COR. ABBOTT, C. J.

The patent was for a method of removing the superfluous fibres of lace by means of a flame of gas, which, passing up through the interstices of the lace, singed off those fibres or ends of fibres, which formed not an integral part of the meshes, but a kind of fur or wool about them. Over the flame and the lace was a chimney, producing a current of air which drew the flame up through the meshes of the lace. The lace was passed over the flame by means of rollers, the velocity of its passage being regulated according to the nature of the lace, so that the fur should be burnt off without injury to the lace itself. This had not been done effectually until the plaintiff made his invention, which, therefore, was of great value, and was generally used in England.

The defence was, first, that the same result had been accomplished by other kinds of flame, which was not substantiated;[1]

[1] The report says: "The witnesses for the defendants proved that the flame of charcoal, of waste paper, wood, shavings, or common pit-coal, had been used for many years to singe the fibres from silk, cotton, or lace sleeves, but the articles for this purpose had been placed on a wooden leg or a sleeve-board; that bellows had been used to force the flame against the article, which it was said would produce the effect of burning the interstices." That none of these means accomplished the object aimed at is plain from the fact that the plaintiff's process revolutionized the manufacture of lace in England.

and, secondly, that the flame of gas being well known, its use for the particular purpose of the plaintiff's invention was not patentable.

The jury found for the plaintiff, the court refused to disturb the verdict, and the patentee enjoyed the benefit of his patent for the whole of the term.

KAY *v.* MARSHALL, 8 Cl. & Fin. 245.

The plaintiff had a patent (1) for macerating flax, so that its fibres were shortened for spinning, and (2) for altering the relative positions of the drawing and retaining rollers, so that they should be not more than two and a half inches apart.

It being shown that the rollers in cotton-spinning machines were so placed, — *Held*, that it was no invention to transfer the arrangement to the spinning of flax in its changed condition.[1]

CRANE *v.* PRICE, Web. p. 408.

Common Pleas, 1842. Sir N. C. Tindal, C. J., Erskine, J., Maule, J.

Crane's patent of Sept. 28, 1836, for an "improvement in the manufacture of iron." This patent followed that of Neilson[2] in the same art. Neilson discovered that a hot blast is better than a cold blast in an iron furnace, — this fact being exactly contrary to the universal opinion before his discovery. Neilson's patent was for the interposition of a heated receptacle between the air-blast and the furnace, wherein the blast should be heated on its way to the furnace. At the time of Crane's discovery, bituminous coal only was used in the manufacture of iron. Attempts had been made to use anthracite coal with the cold blast, but they were unsuccessful. About eight years after Neilson's patent issued, Crane discovered that, with the hot blast, anthracite coal could be used in smelting iron. This new use of the hot blast improved the quality of the iron, and greatly diminished its cost. In his patent, Crane gave directions as to the proportions of coal and ore, the temperature of the air-blast, and the size of the coal.

[1] *Vide ante*, page 286.

[2] *Vide* Neilson *v.* Harford, *post*, page 611.

These matters, it was shown, were not determined without experiments, which consumed time and money.

Sir N. C. Tindal, C. J., delivered the opinion of the court as follows: —

" . . . What he [the patentee] claims as his invention is the application of anthracite or stone coal, and culm, combined with the using of the hot-air blast, in the smelting and manufacture of iron, from iron-stone, mine, or ore. And the question, therefore, becomes this, — whether, admitting the using of the hot-air blast to have been known before in the manufacture of iron with bituminous coal, and the use of anthracite or stone coal to have been known before in the manufacture of iron with cold blast, but that the combination of the two together (the hot blast and the anthracite) were not known to be combined before in the manufacture of iron, whether such combination can be the subject of a patent.

" We are of opinion that if the result produced by such a combination is either a new article or a better article, or a cheaper article to the public than that produced before by the old method, that such combination is an invention or manufacture intended by the statute, and may well become the subject of a patent. Such an assumed state of facts falls clearly within the principle exemplified by Abbott, C. J.,[1] where he is determining what is or what is not the subject of a patent; namely, it may, perhaps, extend to a new process to be carried on by known implements or elements acting upon known substances, and ultimately producing some other known substance, but producing it in a cheaper or more expeditious manner, or a better or more useful kind. And it falls also within the doctrine laid down by Lord Eldon,[2] that there may be a valid patent for a new combination of materials previously in use for the same purpose, or even for a new method of applying such materials. But the specification must clearly express that it is in respect of such new combination or application.

" There are numerous instances of patents which have been granted where the invention consisted in no more than in the use of things already known, but producing those effects so as to be more economically or beneficially enjoyed by the public."

The learned Chief Justice then mentioned the cases of Hall *v.* Jarvis, *ante*, page 375; Derosne *v.* Fairie, Web. p. 152; Hill *v.* Thompson, Web. p. 229; The King *v.* Daniell, reported in Godson on Pat. 274; and he continued: —

[1] The King *v.* Wheeler, 2 B. & Ald. 319.

[2] Hill *v.* Thompson, Web. 237.

"The only question, therefore, that ought to be considered on the evidence is, was the iron produced by the combination of the hot blast and the anthracite a better or a cheaper article than was before produced from the combination of the hot blast and the bituminous coal; and was the combination described in the specification new as to the public use thereof in England. . . . We think there is no doubt that the result of the combination of the hot blast with the anthracite on the yield of the furnaces was more, the nature, properties, and quality of the iron better, and the expense of making the iron less, than it was under the former process, by means of the combination of the hot blast with the bituminous coal.

"It is to be observed that no evidence was produced on the part of the defendants to meet that given by the plaintiff on these grounds; and that it was a necessary consequence, from the proof in the cause, that from the substitution of the anthracite coal, in whole or in part, instead of . . . bituminous coal, the manufacture of the iron should be obtained at less expense.

"It was objected in the course of the argument that the quality or degree of invention was so small, that it could not become the subject-matter of a patent; that a person who could procure a license to use the hot-air blast under Neilson's patent had a full right to apply that blast to coal of any nature whatever, whether bituminous or stone coal. But we think, if it were necessary to consider the labor, pains, and expense incurred by the plaintiff in bringing his discovery to perfection, that there is evidence in this cause that the expense was considerable and the experiments numerous. But, in point of law, the labor of thought or of experiments, and the expenditure of money, are not the essential grounds of consideration on which the question, whether the invention is or is not the subject-matter of a patent, ought to depend. For if the invention be new and useful to the public, it is not material whether it be the result of long experiments and profound research, or whether by some sudden and lucky thought, or mere accidental discovery. . . . If the combination now under consideration be, as we think it is, a manufacture within the statute of James, there was abundant evidence in the cause that it had been the great object and desideratum, before the granting of the patent, to smelt iron-stone by means of anthracite coal, and that it had never been done before; there was no evidence on the part of the defendants to meet that which the plaintiff brought forward."

This decision was questioned by Willes, J., in the case of Horton *v.* Mabon.[1] He said that the only ground upon which it

[1] 16 C. B. N. S. 141.

could be supported was that the iron produced by Crane's process was materially better than any which had been made before.

In the case of Rushton *v.* Crawley,[1] Sir R. Malins, V. C., said of Crane *v.* Price: —

"It is now generally considered that such a case would not succeed in the present day."

In the case of Murray *v.* Clayton,[2] Sir W. M. James, L. J., also criticised this decision, but not the ground of it, as stated by Tindal, C. J., in the following passage (quoted above): —

"We are of opinion that if the result produced by such a combination is either a new article, or a better article, or a cheaper article to the public, than that produced before by the old method, such combination is an invention or manufacture intended by the statute, and may well become the subject of a patent."

In the case of Smith *v.* The Goodyear Dent. Vul. Co.,[3] Mr. Justice Strong said of Crane *v.* Price: —

"This case has been doubted, but it has not been overruled; and the doubts have arisen from the uncertainty whether any new result was obtained by the use of anthracite."

MUNTZ *v.* FOSTER, 2 WEB. P. C. 96.

COMMON PLEAS, 1844. COR. SIR N. C. TINDAL, C. J., AND A JURY.

Muntz's patent of Oct. 22, 1832, for "an improved manufacture of metal plates for sheathing the bottoms of ships or other such vessels."

It described plates made of a mixture containing sixty parts of copper and forty of zinc. This compound was cast in ingots, and rolled while at a red heat. Full directions were given for making the sheathing. The merit of it was that in sea-water it rusted enough to prevent accumulation of barnacles upon it, and yet it did not rust so much as the sheathing ordinarily used. It was therefore both effective and durable, and a very valuable invention.

[1] L. R. 10 Eq. 522. [2] L. R. 7 Ch. App. 570. [3] 93 U. S. p. 492.

Tindal, C. J., thus instructed the jury: —

" . . . I cannot think, as at present advised, that if it was shown (as possibly it might be) that sheets had been made of metal before in the same proportions which he has pointed out; that if this hidden virtue or quality had not been discovered or ascertained, and consequently the application never made, — I cannot think the patent will fail on that ground. That is the opinion which I form upon it. I look upon it that there is as much merit in discovering the hidden and concealed virtue of a compound alloy of metal, as there would be in discovering an unknown quality which a natural earth or stone possessed.

" We know by the cases that have been determined, that where such unknown qualities have, from the result of experiments, been applied to useful purposes of life, that such application has been considered as the ground, and a proper ground, of a patent; and therefore when I came to that part of the case in which they seek to show this is not so, because these metal plates have been invented before, — that is, persons have used them before, — in my judgment it will not go far enough, unless they can show there has been some application of them before to this very useful purpose." [1]

REGINA *v.* CUTLER, 3 C. & K. 215; 14 Q. B. 372, note.

Queen's Bench, 1849. Cor. Lord Denman, C. J., and a Jury.

Head-note: "A patent for the application of iron tubes coated with brass to form the tubular flues of steam-boilers cannot be supported; for, although the application of the tubes was new, neither the tubes themselves nor the mode of applying them was new."

Lord Denman, C. J.: —

"If he had introduced a new article which required the application of a new principle to the production of it, it might have formed a subject for a patent; but the mere application of a thing which existed before does not appear to me to be a subject for a patent. And, in general terms, I think that the application of an article to produce any particular result, the party having no claim either to the mode of producing the article or to the mode of applying it for attaining that result, forms no ground for a patent."

[1] The prior patent of one Collins was also set up in defence; but as this was passed upon by the jury only, we do not report it. The case was compromised at the end of the jury trial.

At a subsequent trial, Wightman, J., gave the same direction to the jury.

The case was compromised, and never brought before a court of error.

NEWTON *v.* VAUCHER, 6 Ex. R. 859; 21 L. J. Ex. 305.

Exchequer Chamber, 1851.

W. E. Newton's patent of May 15, 1843, No. 9724, for "improvements in the construction of boxes for the axles of carriages and for the bearings or journals of machinery." The patent provided for lining the inner part of the boxes used to support gudgeons or axles with a metal compounded of fifty parts tin, five antimony, and one copper. The use of this soft metal prevented heating and abrasion, because (and this was the patentee's discovery) such soft metal was "incompetent to take up the motion of heat by friction."

The defendant had an earlier patent, No. 7800, dated Sept. 8, 1838, for a soft-metal compound for packing the pistons of hydraulic engines, which consisted in forty parts of tin, sixty of zinc, and four of antimony. It was cast in grooves running around the piston.

Parke, B.: —

"... After the date of the defendant's patent it was discovered ... that soft metal could be used beneficially, not merely for the purpose of excluding air and water, but that it produced this remarkable effect, — that where there was pressure upon it, friction was in a great degree diminished.

"That probably arises, as my Brother Alderson has suggested, from the circumstance that the particles of the soft metal (which may be said to approach more nearly in their nature to those of a fluid) have comparatively a more easy motion among themselves than those of a hard metal. If water could be confined in the same way as soft metal is, and the axis could be made to revolve in the water so confined, the invention might possibly answer as well. It was, however, discovered that by the action of soft metal no heat or friction, comparatively speaking, would take place.

"Then the question is, whether the plaintiff's patent is for the application of that principle. Now, upon looking at his specification, which embodies a new principle in a new machine, it differs materially from

the defendant's, which is for the purpose merely of packing; for in the plaintiff's invention it is essential that there should be not only the intervention of soft metal, but that there should also be a hard rim covered in part with that soft metal, or some other means to prevent the soft metal from expanding and getting out of its place. But any other hard rim covered with soft metal, or substances covered with soft metal, are part of that machine; that is no part of the defendant's invention. Therefore, I think the discovery by the person under whom the plaintiff claims is not merely the discovery of a new principle, but of a new principle embodied in a new machine. Then, that being so, if the plaintiff claims a patent for that new principle embodied in a new machine, and that only for the purpose of diminishing friction, and the application of it is only to cases where there is pressure as well as motion, that patent is perfectly good; but if he has also claimed in it the application of soft metal to all cases of stuffing, to exclude fluids of every description, his patent in that respect is for an old invention, and is void."

BUSH *v.* FOX, 5 H. L. CAS. 707; 2 JUR. N. S. 1029.

HOUSE OF LORDS, 1856.

A patent, dated Sept. 21, 1841, for "improvements in the means of, and in the apparatus for, building and working under water."

"What I claim is," said the patentee, "the mode of constructing the interior of a caisson, in such manner that the work-people may be supplied with compressed air, and be able to raise the materials excavated, and to make or construct foundations and buildings, as above described."

The means and apparatus consisted chiefly in a caisson, which became part of the foundation.

The report contains no description of the contrivance; but it was substantially the same as that described in Lord Cochrane's patent of Oct. 20, 1830, and intended to be used in mines or other subterranean places. It was therefore *held* that the plaintiff's use of it *under water*, instead of on land, was not patentable.

BROOK *v.* ASTON, 8 E. & B. 478.

QUEEN'S BENCH, 1857.

Brook & Hirst's patent of Feb. 23, 1856, for finishing yarns of wool or hair by a process substantially like that applied before to yarns of cotton and linen, held void.

Lord Campbell, C. J.:—

"It may well be that a patent may be valid for the application of an old invention to a new purpose; but, to make it valid, there must be some novelty in the application. Here there is none at all. . . . In all the cases in which a patent has been supported, there has been some discovery, some invention. It has not been, as in this case, merely the application of the old machinery, in the old manner, to an analogous substance. That cannot be the subject of a patent."

On writ of error, this decision was affirmed by the Court of Exchequer Chamber, 5 Jur. N. S. 1025 (1859).

TETLEY *v.* EASTON, 2 C. B. N. S. 706; 26 L. J. C. P. 269.

COMMON PLEAS, 1857.

The invention was an improvement in machinery for raising and impelling water by centrifugal force, and it consisted in the introduction of water at both sides of the wheel, instead of at one side only, as was the case before.

The defence set up a patent to one Ruthven (of 1841) for a mode of increasing the power of air or water when acted upon by rotary fans or other similar apparatus. The court thus remarked upon it:—

"Another drawing of the inner case with its fans showed that there was an opening in the rim of the case at the front of each fan, — the fans, in fact, dividing the inner case into six compartments, or any other number, dependent, of course, on the number of fans. And this inner case so divided by fans, with the openings in the rim, and admitting water at both sides, was almost identical with the wheel used by the plaintiff, except that it had not a central disk, and was attached to the axle by spokes extending from the axle to the outer edge of the opening, for the admission of air or water.

"Ruthven was mistaken in supposing that, by the use of these fans,

he should obtain an increase of force; and it did not appear that his machine was brought into use. And the question is, whether, notwithstanding the information given to the public by Ruthven's specification, the plaintiff can claim to be the first inventor of 'the means of increasing the action of the machine by causing the liquid to enter the wheel at both sides.' The form of the wheel used by the plaintiff was not new, nor does he claim it as new; nor was the plan of admitting water at both sides for the purpose of being projected forwards by centrifugal force new, it having been made known by the specification enrolled by Ruthven, and the drawings annexed to it.

"It may be true that the plaintiff first explained the full benefit obtained by so introducing it; but the discovery that a particular advantage was obtained by the use of a wheel known before, in a manner known before, cannot be called an invention or application to sustain a patent. Losh *v.* Hague, 1 Web. P. C. 202; Hindmarch on Patents, 94."

THE PATENT BOTTLE-ENVELOPE CO. *v.* SEYMER, 5 C. B. N. S. 164; 5 JUR. N. S. 174.

COMMON PLEAS, 1858.

The plaintiffs' patent was for a mode of making bottle envelopes, which included the use of a model or mandrel.

Said the court, through Willes, J.: —

"The defendant's method resembles the plaintiffs' in the product, which is not the subject of the patent, and in one other material particular only; namely, the use of the model or mandrel. . . . The question therefore is, whether the plaintiffs could have taken out a patent simply for applying a model or mandrel in the form of a bottle, or indeed a bottle itself, in making envelopes for bottles. We are of opinion that he could not.

"The use of a model or mandrel for producing given forms of pliable materials was admitted at the trial, and indeed, without such admission, is well known to have been for ages common and usual in various arts. Such use was part of common knowledge, and a model or mandrel, for purposes similar to that of this patent, an ordinary and well-known tool. It is merely in respect of the sort of material to which it is applied, and the form of the utensil produced by it, that the plaintiffs' application of the model possesses any novelty," &c.

WILLIS *v.* DAVISON, 1 N. R. 234.

QUEEN'S BENCH, 1863.

H. Willis's patent of Feb. 28, 1851, No. 13,538, for "improvements in the construction of organs." The alleged invention was the combination of a compound valve with a pneumatic lever, as an *escape* valve.

It being proved that a similar valve "had been fitted to pedal organs as a *supply* valve, in order to obtain greater ease in working," it was *held* that the patent was void.

HARWOOD *v.* THE GREAT NORTHERN RAILWAY CO., 29 L. J. Q. B. 193; 6 JUR. N. S. 993; 11 H. L. CAS. 654 (1865).

Wild's patent, granted in 1853, for "improvements in fishes and fish-joints, for connecting the rails of railways."

The specification said:—

"The fishes are made with a groove or recess in their outer surfaces, which groove serves to receive the square heads of the bolts, and prevent them turning round when the nuts are screwed on or off. Washers are placed in the groove of the fish which is next to the nuts, so as to allow of the nuts being turned around; or the fish on this side may be made without the groove. The position of the bolts and nuts may be reversed, if preferred, so that the nut may be prevented from turning round while the bolt is screwed into it. *The groove renders the fish lighter for an equal strength, or stronger for an equal weight of metal*, than a fish which is made of an equal thickness throughout. The top and bottom of each fish is a plane surface, and the parts of the rail with which they come in contact are also plane surfaces, forming the same angle as the top and bottom surfaces of the fish. The fishes are thus made to fit into their places with greater facility than if these surfaces were of curved or irregular forms. If, however, the surfaces of the rails are curved, the fishes may be made to fit them."

The specification next describes the thickness of the heads of the bolts, or nuts, or rivets, and says that the effect of their being in grooves is to make them

"project less with the same thickness of head than when plain, ungrooved fishes are employed. This is a matter of great advantage,

as avoiding the danger of the flanges of the wheels of the carriages coming into collision with the rivets."

Contrivances alleged to anticipate this improvement are thus described in the report (11 H. L. Cas. p. 657):—

"It was proved that before the date of the patent the rails of railways had been connected by fishes and fish-joints, attached to each side of the rails at the joints by means of bolts and nuts. In some cases flat fishes had been used. These were of different kinds; but until the time of Wild's patent, fishes for connecting the rails of railways had never been made with a groove or recess in their outer or lateral surfaces, so as to receive the square heads of the bolts, and at the same time, in the words of the specification, to 'render the fish lighter for an equal strength, or stronger for an equal weight of metal, than a fish made of equal thickness throughout.'

"But it was also proved that before the date of the patent, and under the superintendence of the late Mr. Brunel, in the construction of bridges beams of timber had been laid horizontally, one above the other, and fastened or bolted together with bolts and nuts; that horizontal bars or plates of iron were placed beneath, and parallel to and in contact with the horizontal beams, and were also fastened or bolted by the same bolts and nuts; and that each of these bars or plates of iron was constructed with a groove in its under surface, which received the square or horizontal heads of the bolts. This was done for the purpose of strength, and also to prevent the heads of the bolts from turning. But in these bridges there were not joints to be fished by the bars or plates of iron, nor were there corresponding bars or plates of iron above the horizontal beams; and it was therefore insisted that there was no fishing in the proper sense of the word. . . . It was further proved by the defendants that in 1847 Mr. Brunel had constructed a timber bridge, known as the 'Hackney Bridge,' for carrying the South Devon Railway over the Teign Canal. The span of this bridge was too great to be conveniently crossed by any single beam, and the bridge was constructed so as to have upon each side two horizontal, longitudinal beams of timber, the ends of which met, and were joined together in the middle of the bridge by scarf-joints. Beneath these beams were placed transverse planks, which extended from side to side of the bridge, and constituted its flooring or roadway; and immediately beneath the ends of the planks were longitudinal bars of grooved iron, one upon each side of the bridge, running parallel to and under the longitudinal beams along the whole length of the bridge, with the grooves or channels downwards. Bolts with square heads passed

through the grooved iron bars, transverse planking, and longitudinal beams from the lower to the upper end of the bridge, the square heads of the bolts resting in the grooves of the iron bars, and being prevented from turning round within the grooves, and the nuts were screwed on to the upper ends of the bolts.

"In answer to questions specially put by the Lord Chief Justice, the jury found 'that the channel irons upon the railway bridges (independently of the particular instance of the Hackney Bridge) were used before the patent, for the double purpose of obtaining increased strength and preventing the bolt-heads from turning round, but they were not used for the purpose of fishing. Secondly, that the fastening of the scarf-joint of the longitudinal beam at the Hackney Bridge was a fishing of that joint, but that the use of the channel iron as one of the plates of the fish arose from its being already there for the purpose of fastening the beam and this iron together, and was not adopted by Mr. Brunel in reference to, or in contemplation of, the special advantages in fishing contemplated by Wild's patent.'"

On these findings the Lord Chief Justice directed a verdict for the plaintiffs, "with leave reserved to move. A rule was obtained to have a verdict entered for the defendants pursuant to leave, or for a new trial on the ground of misdirection with respect to the use of the grooved iron in Hackney Bridge. This rule was afterward discharged. On appeal to the Exchequer Chamber that decision was reversed; and it was ordered that the verdict be entered for the defendants upon the pleas denying that the invention was new, and that it was the subject-matter of a patent. This appeal was then brought. The judges were summoned, and Mr. Justice Williams, Mr. Baron Channell, Mr. Justice Blackburn, Mr. Justice Keating, Mr. Baron Pigott, and Mr. Justice Shee attended." The appeal was dismissed.

Mr. Baron Channell (after rehearsing the evidence): —

"The point for consideration is thus reduced to this: whether the fishing of rails meeting but-end to but-end with iron plates bolted together, and the strengthening of solid timbers by iron plates also bolted to the timbers, as above stated, are analogous subjects.

"It seems to us . . . (though being a question of mere mechanics, we desire to express our opinion with diffidence) that they are analogous. . . . The fact, however, seems to be that a grooved iron plate, when used as a binding support, is as strong at least as the same plate would be if ungrooved; and this discovery was made before the patent, and was given to the world, and, in the language of the court of

Exchequer Chamber, 'though not immediately applied, it was immediately applicable, to all forms of pieces of iron used for holding together other materials.'

"But it was argued at the bar of your Lordships' house that there was invention at all events in this, that whereas the grooved iron as used in the bridges had been applied for the purpose of binding together pieces of material laid one upon another horizontally, the grooved iron in fishing the rails was applied laterally, in binding together the material, and that its great merit consisted in its performing the novel function of resisting the vertical pressure to which it was exposed, and did so by means of a plate equally strong, but rendered lighter than that previously in use by the removal of that portion of the plate which was useless in resisting such pressure. . . . Wild . . . certainly does state . . . that the groove renders the fish lighter for equal strength, or stronger for equal weight, but that, as to grooved iron, was previously well known, and is a very different thing from claiming the invention as now put forward. If he had intended to claim the discovery that, by the removal of a certain quantity of material from a particular part of the solid plate, in the shape of a groove, the power of resistance to vertical pressure would not be diminished, he would surely have described the sort of groove that would produce that effect with the greatest certainty. . . . What appears to us to show that no such claim was contemplated by the patentee is this, that if the power of resisting vertical pressure produced or effected by the groove would be a merit in the fishes, it would be equally applicable to both; not to one more than the other; yet the patentee himself suggests in one part of his specification that the inside fish need *not* be grooved.

"Then, as regards the second advantage of the groove in receiving the bolt head, it seems impossible to say, after its use for the identical purpose in the bridges, whenever it became necessary to fit an iron plate to another material by screws and nuts, that the analogy, for that purpose at all events, is not clear and obvious. It is in this respect only a bare transference. . . ."

The Lord Chancellor (Lord Westbury), Lord Cranworth, and Lord Wensleydale also delivered opinions to the same effect.

Mr. Justice Blackburn, with whom concurred Mr. Justice Shee, dissented from the opinion of the majority. "We differ," he said, "not as lawyers, but as mechanics and engineers." And he, as well as Mr. Baron Channell, from whose opinion we have just quoted, cited with approval the language of Chief Justice Cockburn in the court below. It may be found at page 283, *ante*.

Mr. Justice Blackburn said: —

"The essence of the invention lay in the thought that inasmuch as the fish was intended to resist a strain in its own plane, the metal in the centre of the fish, which was comparatively inert for the purpose of resisting such a strain, might with advantage be partially removed. The patentee does not in his specification state that the heavy train was to run along the tops of the rails, and that the fish was placed with its plane vertical to resist the vertical strain so produced, nor that the reason why the groove might be made, producing economy of material without diminution of strength, was because the plate was so placed, and that such was the strain it had to resist; but we think that all this might be supplied and was supplied by evidence. . . .

"Mr. Brunel . . . used a channelled iron for the purpose of strengthening the beams of a bridge, and in the case of the Hackney Bridge for the purpose of strengthening a scarf-joint; but the iron was placed horizontally, for the purpose of resisting vertical pressure. The channelled iron would have been a bad form for resisting a pressure such as is borne by the fish-uniting rails. The two wings would, under such a pressure, we apprehend, collapse together, and the centre snap; but it was a good form for the purpose of resisting a flexure transverse to the plane of the iron for which it was used; and what Mr. Brunel did in no way anticipated the plaintiff's idea, founded on the uselessness of the centre part of a plate placed vertically for the purpose of resisting vertical pressure, and used for the purpose of counteracting a tendency to flexure in the plane of the plate. In truth, in the plates and channelled iron used by Mr. Brunel in his bridges, the grooves and channels were not formed by removing useless or inert material, but on, as we apprehend, a totally different principle. He, in effect, added rims or wings to strengthen the flat plate against transverse flexure; he did not make a groove by removing the part of a plate used to resist flexure in its own plane."

PENN *v.* BIBBY, L. R. 2 Ch. App. 127.

Lord Chelmsford, L. C., 1866.

John Penn's patent, dated Oct. 2, 1854, for "an improvement in the bearings and bushes for the shafts of screw and submerged propellers."

The improvement consisted in employing wood, instead of

metal, in the manner described by the specification, as follows: —

"The object of the invention is that the parts of a propeller-shaft which are within bearings shall not come in contact with metal of the bearings, but against pieces of wood fixed therein, in such manner as to admit of water flowing freely between the pieces of wood, and between the inner surfaces of the metal bearings and the outer surfaces of the propeller-shaft."

The difficulty with the old bearings was that, metal being made to work upon metal, they soon wore out; also, the propeller thus made gave to the vessel a violent and irregular motion. The plaintiff's propeller overcame these difficulties, and it was of great utility.

Lord Chelmsford, L. C.: —

"It was objected that . . . the alleged invention was merely a new application of an old and well-known thing.

"It is very difficult to extract any principle from the various decisions on this subject which can be applied with certainty to every case; nor, indeed, is it easy to reconcile them with each other. The criterion given by Lord Campbell in Brook *v.* Aston (8 E. & B. 485) has been frequently cited (as it was in the present argument), that a patent may be valid for the application of an old invention to a new purpose, but to make it valid there must be some novelty in the application. I cannot help thinking that there must be some inaccuracy in the report of his Lordship's words, because, according to the proposition, as he stated it, if the invention is applied to a new purpose, there cannot but be some novelty in the application.[1] Lord Chief Justice Cockburn approaches much nearer to the enunciation of a principle, or at least of a rule, for judging these cases, in Harwood *v.* Great Northern Railway Co. (2 B. & S. 208), where he says: 'Although the authorities establish the proposition that the same means, apparatus, or mechanical contrivance cannot be applied to the same purpose, or to purposes so nearly cognate and similar as that the application of it in the one case naturally leads to application of it when required in some other, still the question in every case is one of degree, whether the amount of affinity or similarity which exists between the two purposes is such that they are substantially the same, and that determines whether the invention is sufficiently meritorious to be deserving of a patent.

[1] Did not Lord Campbell mean *mode* or *means* of application? *Vide* that there must be novelty in the page 284, *ante*.

"'In every case of this description one main consideration seems to be whether the new application lies so much out of the track of the former use as not naturally to suggest itself to a person turning his mind to the subject, but to require some application of thought and study.'

". . . Applying this test. . . . The only examples of old use alleged by the defendants were in grindstones and water-wheels. No doubt these have what may be called bearings, but they are of a totally different character and for a totally different object from the bearings patented. In neither water-wheel nor grindstone is there a wooden bearing in which the wheel revolves, but the wheel is merely supported on wood, not encased or submerged, nor constructed for the purpose of admitting the water to flow freely within the bearing; and the revolutions of each of them are at a very slow pace. It is difficult to believe that bearings of this description could ever have suggested the application of wood to the bearings of screw-propellers in the way described in the patent. It is to my mind not merely a different application, but something in itself essentially different.

". . . It would be an extraordinary fact if an invention of this kind, so long wanted, and of such great utility, should have been lying in everybody's way who knew anything of the construction of a water-wheel or grindstone, and yet should never before have been discovered; and equally remarkable, if the invention had been anticipated in these familiar machines, that the admiralty and the mercantile marine, and upwards of fifty firms, should have submitted to pay royalties for the privilege of being permitted to use it."

RUSHTON *v.* CRAWLEY, L. R. 10 Eq. 522.

SIR R. MALINS, VICE-CHANCELLOR, 1870.

Rushton's patent of June 24, 1867, for an improvement in the manufacture of artificial hair, for use as head-dresses, and in other ways.

The specification concluded thus:—

"I claim the use and application of wool, particularly that kind known as Russian tops, or other similar wools or fibre, in the manufacture of artificial hair, in the imitation of human hair, and also in the manufacture of crisped or curled hair for furniture, upholstery, and other like purposes."

"'Russian tops,'" the report says, "was a name given to Russian wool of a coarse description, the long pieces of the fibre being combed out and separated from the rest, and then designated as 'wool tops.'"

The Vice-Chancellor dismissed the bill with indignation, on the ground that the invention claimed was neither novel nor patentable. He said: —

". . . The witnesses in cross-examination have proved beyond doubt that it has been the common course of the trade to make these things from wool of all kinds for certainly the last fourteen or fifteen years. . . .

"It is a gross violation of the privilege conferred upon inventors for a person to take out a patent for a known article which has been used for years, because he finds he can produce a thing cheaper or better by a new material, or to suppose that directly he uses the new material it can be a subject for a patent. Suppose any one should discover some other well-known material for making these things, such as paper, is he to take out a patent for it? and afterwards some one else should find out they could be made of straw, is he also to have a patent? So far as my opinion goes, and I desire it to be distinctly understood, the use of a new material to produce a known article is not the subject of a patent, but there must be some invention, something really new, something more valuable to the public than the simple use of a new material to produce a known article."

Of Crane *v.* Price (*ante*, page 376), he said: —

"The patent was established, but it is now generally considered that such a case would not succeed in the present day."

And of Brook *v.* Aston (*ante*, page 383): —

"It is conclusive against the plaintiff."

See also —

PARKES *v.* STEVENS, *ante*, page 278.
POW *v.* TAUNTON, 9 Jur. 1056.
DANGERFIELD *v.* JONES, 13 L. T. N. S. 142.

American cases on the subject of New Use elsewhere in this book are the following: —

WATERBURY BRASS CO. *v.* MILLER, *ante*, page 106.
TILGHMAN *v.* MORSE, *ante*, page 122.

JENKINS *v.* WALKER, *ante*, page 124.
CLARK *v.* SCOTT, *ante*, page 129.
In re APPLICATION OF J. ARKELL, *ante*, page 170.
ATLANTIC GIANT POWDER CO. *v.* RAND, *ante*, page 173.
GRIFFITHS *v.* HOLMES, *ante*, page 183.
PEARCE *v.* MULFORD, *ante*, page 255.
PENN. SALT MFG. CO. *v.* GUGENHEIM, *ante*, page 265.
GLUE CO. *v.* UPTON, *ante*, page 267.
REED *v.* REED, *ante*, page 269.
STEINER *v.* HEALD, *ante*, page 292.
SPILL *v.* THE CELLULOID MFG. CO., *ante*, page 293.
THE LOCOMOTIVE, &C. TRUCK CO. *v.* THE ERIE RY. CO., *post*, page 440.
RUBBER-COATED HARNESS-TRIMMING CO. *v.* WELLING, *post*, page 457.
DALTON *v.* NELSON, *post*. page 519.
LE ROY *v.* TATHAM, *post*, page 574.
BELL *v.* DANIELS, *post*, page 616.

See also VINTON *v.* HAMILTON, 104 U. S. 485.

CHAPTER V.

COMBINATION.

114. Two preliminary remarks are necessary: —

(1.) Some or all of the elements in a combination may be old. They may have been used before, separately, or in other combinations. This does not necessarily affect the patentability of a combination of those elements.[1]

(2.) Any newly invented or discovered thing,[2] or anything in which a new function or property[3] has been discovered, may be claimed in combination with any other thing or things.

Note. — The substitution of an equivalent (*vide ante*, page 63) in a combination, as elsewhere, is not invention.

115. When we come to consider the nature of a patentable combination,[4] we find it very difficult to obtain a definition which

[1] Ryan *v.* Goodwin, 3 Sumner, 514; Parks *v.* Booth, 102 U. S. 96; Hailes *v.* Van Wormer, 20 Wall. 353; Lister *v.* Leather, 8 El. & Bl. 1004.

[2] The Russell, &c. Mfg. Co. *v.* Mallory, 10 Blatch. 140; Watson *v.* Cunningham, 4 Fish. 528; Potter *v.* Holland, 4 Blatch. 238.

[3] Goold *v.* Rees, 15 Wall. p. 193.

[4] Much confusion arises from another use of the word "combination," especially in the specification of a patent, where it sometimes intends, not a technical combination, but a machine, or part of a machine, more or less complex. In these cases, "combination" is used as a convenient term, and for want of a better, to denote an entity composed of several parts, all of which are new. Thus a machine is often described as consisting in a combination of the part A with the part B and with the part C; or as consisting in the part A, *combined* with B and with C, although all the parts are new, and the validity of the patent does not depend upon their *combining*, in the patent-law sense.

Sewing-machines, for instance, are often described in this manner. Thus, a man having invented a feeding mechanism to move the cloth under the needle, and also a needle to sew the cloth, describes the machine as consisting in the combination of the feeding mechanism and the needle; meaning that the machine invented is composed of those two new parts, not that the invention lay in combining them (one or both of them being old) into a new machine.

Mr. Justice Clifford, in the case of Howe *v.* Williams (2 Fish. p. 401), remarked upon the two uses of the word "combination" as follows: —

"Like other sewing-machines in

will fit all cases. It is commonly said that a combination, as distinguished from an aggregation, is patentable. The one is a union, the other an assemblage, of elements. Co-action is the badge of the first; mere juxtaposition is the badge of the other.

For instance, in Reckendorfer *v.* Faber,[1] a leading case, the patentee had joined together a lead-pencil and a rubber-eraser by making a groove in one end of the pencil for about a quarter of its length, and glueing the rubber therein. The court held that this was a mere aggregation. The juxtaposition of the pencil and the eraser might be a convenience; but

"no effect is produced, no result follows from the joint use of the two. A handle in common, a joint handle, does not create a new or combined operation."

use at the present time, the one described in the patent of the complainant is composed of various devices; but the claim is for the *organized machine* as an *existing whole*, and not merely for some or all of the separate devices of which it is composed, or for some or all of those devices as a mere technical combination. Undoubtedly the several devices operate in combination, and consequently the invention itself consists, in a certain sense, of a combination of those various elements so constructed and moulded into harmonious action as to accomplish the described result; but still the invention is not a technical combination of old devices, where, in order to maintain an infringement, it is necessary to show that the respondent has pirated the whole. On the contrary, the claim under consideration obviously is, that the complainant is the original and first inventor of the organized sewing-machine, whose several devices are described in the specification when viewed as an existing whole, and operating to accomplish the desired result."

So also Mr. Justice Curtis, in Foster *v.* Moore, 1 Curtis C. C. R. p. 292: —

"Very nice and difficult questions have been made concerning what are often called combinations, but the elements of which are not capable of being distinctly defined and separated. If a combination, properly so called, consist of two or more distinct things, and the patent is for combining them into one whole, it is familiar law that if all are not used the patent is not infringed.

"But the first claim in this patent is not for such a combination. It is for an operative part of a machine, and in substance covers that operative part, just as a patent for an entire machine covers the whole machine. In some sense it may be called a combination, for it consists of different parts united together, as an entire machine does. But it is not strictly and technically a combination, any more than an entire machine is; and it may be improved, and a patent taken for that improvement, and at the same time the improvement cannot be used without the consent of the original patentee."

[1] 92 U. S. 347. See also Rubber-Tip Pencil Co. *v.* Howard, 20 Wall. 498; The Double-Pointed Tack Co. *v.* The Two Rivers Co., 18 O. G. 683; Ross *v.* Wolfinger, 5 O. G. 117; Alcott *v.* Young, 16 Blatch. 134.

116. On the other hand, where two functions are combined in one thing, there is such co-action of the parts that one part is merged in the other. This is the simplest and most obvious case of patentable combination. An example given by Mr. Justice Hunt, in the case just mentioned, is that of a stem-winding watch-key. He said: —

"The office of the stem is to hold the watch, or hang the chain to the watch; the office of the key is to wind it. When the stem is made the key, the joint duty of holding the chain and winding the watch is performed by the same instrument. A double effect is produced or a double duty is performed by the combined result." [1]

117. So far it is plain sailing; but when we come to consider what sort of co-action is required to make a combination patentable, a difficulty arises. It need not be simultaneous co-action. The elements of the combination may act at different times. Thus there are patentable and patented combinations of machinery in which the parts operate, not simultaneously, but one after the other.[2] Is it sufficient, then, that the several elements of the alleged combination should form a part of the same contrivance, each element contributing to the efficacy thereof? No; for this is true of many cases of mere aggregation. For instance, in Hailes *v.* Van Wormer,[3] the patentee had taken a fire-pot from one stove, a revertible flue from another, and a reservoir or feeder from a third, and combined them in a new and improved stove.

Of these three elements, each contributed its share to the efficacy of the stove; and, each being particularly good of its kind, the new stove may have been better than any in use before it. But the three elements did not bring about a common result, as, for instance, the combustion of coal; for one element served to radiate the heat from the base of the stove, another carried off the products of combustion, and the third operated to economize the coal used. The elements did not aid or affect each other in the discharge of their several duties.

Their joint employment, therefore, amounted to a mere aggre-

[1] Such seems to have been the combination in the case of Bussey *v.* Wager, 9 O. G. 300.

[2] Forbush *v.* Cook, 2 Fish. 668; Herring *v.* Nelson, 14 Blatch. 293; Hoe *v.* Cottrell, 18 O. G. 50; Birdsell *v.* McDonald, 6 O. G. p. 682.

[3] 20 Wall. 353. See also Mahn *v.* Harwood, 14 O. G. 859.

gation and not to a patentable combination; whereas, if they had all contributed to a common result, that of combustion, for instance, then perhaps the combination would have been held patentable, — as was the combination in a similar case,[1] where various devices in a lamp united to produce a brilliant flame.

In the stove case, the court[2] said: —

" . . . The three devices . . . have no relation to each other. Neither the form of the feeder nor the shape of the fire-pot bears at all upon the direction of the draft-passages. There is no novel result flowing from the joint operation of the three devices. The revertible flues have no more to do with a stove supplied by a feeder than they would have with a stove supplied by hand. . . .

" . . . It must be conceded that a new combination, if it produces new and useful results,[3] is patentable, though all the constituents of the combination were well known and in common use before the combination was made. But the results must be a product of the combination, and not a mere aggregate of several results, each the complete product of one of the combined elements. Combined results are not necessarily a novel result, nor are they an old result obtained in a new and improved manner. Merely bringing old devices into juxtaposition, and there allowing each to work out its own effect without the production of something novel, is not invention. No one by bringing together several old devices without producing a new and useful result, the joint product of the elements of the combination and something more than an aggregate of old results, can acquire a right to prevent others from using the same devices, either singly or in other combinations, or, even if a new and useful result is obtained, can prevent others from using some of the devices, omitting others, in combination."

118. From this it may be gathered that the elements of a patentable combination must contribute to a new mode of operation or produce a new and common result. It may be that the language of the Supreme Court, just quoted, requires a more strict interpretation than we have given it. This point we shall consider presently; but we may remark here, that it is almost if not quite impossible to frame a definition which shall cover all possible cases of combination. In the stove case, the elements had each a separate and, so to say, detachable effect, whereas in the lamp case, to which we have referred, the effect of each ele-

[1] *Vide post*, page 402.

[2] Mr. Justice Strong delivered the opinion.

[3] The results need not be new; an old result is as good as a new one, if it be produced in a new way.

ment was lost in the common effect; namely, combustion of the oil. In another case the combination may be a chemical union. Again, it may be a combination of two mechanisms which, together, produce a new result. Finally, a mere rearrangement of parts might amount to a new and patentable combination, although it produced no new mode of operation. Thus, if one should rearrange the parts of a lamp, without, however, altering or diminishing them, so that in the new arrangement the lamp was of a smaller and more convenient size, there might be invention in so doing.[1] The difficulty of bringing all these cases under one head, at the same time excluding all non-patentable combinations, is obvious. The courts, however, and the Supreme Court especially, have proceeded as if this difficulty did not exist. Devising a rule to fit the case before them, they go on to state it as one of universal application.

119. But to return, we have said that the elements of a combination must produce a new mode of operation or a new and common result, in order that it should be patentable. We do not, however, undertake to say that the converse is true, — that whenever a new mode of operation or a new and common result is produced, there is a patentable combination; although we recall no case which would conflict with such a proposition, and there are many authorities to support it.

It is plain that there may be a new mode of operation and not a new result; for the new mode of operation may consist in a new way of doing an old thing. It is often assumed, however, that a new result implies a new mode of operation. But in the lamp case (of rearrangement), just suggested, there would be a new result, but no new mode of operation. Therefore, we say, that a patentable combination must produce either a new mode of operation or a new result.

120. Mr. Justice Curtis, in his charge to the jury in the case of Forbush *v.* Cook, *supra*, where a combination of machinery was the subject of the patent, said: —

"If it was a new and useful combination of parts, and he [the patentee] was the first to make the combination, he is an inventor, and

[1] The case here supposed is, to say the least, infrequent. A new arrangement which introduces a new function, or renders operative an incompetent one, is of course a more probable invention. It is found in the case of Woodward *v* Dinsmore, 4 Fish. 163.

may have a valid patent. When I say it must be new, I do not refer to the materials out of which the parts are made, nor merely to the form or workmanship of the parts, or the use of one known equivalent for another. These may all be such as never existed before in such a combination, and yet the combination may not be new, in the sense of the patent law. To be new in that sense, some new mode of operation must be introduced. And it is decisive evidence, though not the only evidence, that a new mode of operation has been introduced, if the practical effect of the new combination is either a new effect, or a materially better effect, or as good an effect more economically attained, by means of the change made in the combination of the patentee. A new or improved or more economical effect, attributable to the change made by the patentee in the mode of operation of existing machinery, proves that the change has introduced a new mode of operation, which is the subject-matter of a patent; and when this is ascertained, it is not a legitimate subject of inquiry, at what cost to the patentee it was made, nor does the validity of the patent depend upon an opinion, formed after the event, respecting the ease or difficulty of attaining it."

121. Doubtless this language was appropriate to the case at bar, but surely the learned judge goes too far in stating broadly that

"a new, or improved, or more economical effect, attributable to the change made by the patentee in the mode of operation of existing machinery, proves that the change has introduced a new mode of operation, which is the subject-matter of a patent."

It might well be that the change made was so slight and so obvious that it was referable to mechanical skill and not to the genius of the inventor; and this, whether the change was the addition of something new or an improvement in something old.

122. It is also to be remarked that there may be a new result, without a new mode of operation. The case we suggested, however, and others like it, where there is a new result, although it cannot be said that there is a new mode of operation, are not so much exceptions to the rule laid down by Mr. Justice Curtis, as cases to which that rule does not apply. He had before him *operative* parts, as of machinery, whereas an article composed of, so to say, inert parts (like a lamp, considered as a portable article, and not as a machine to burn oil), can scarcely be said to have any mode of operation. In such cases, a new result is the test of invention.

123. We proceed to consider the decisions of the Supreme Court in regard to combinations. There are but three cases in which there is any important discussion of this subject; namely, Hailes *v.* Van Wormer and Reckendorfer *v.* Faber, *supra*, and a recent case, Pickering *v.* McCullough.[1] We have already quoted the court's statement of the law in the first of these cases, *ante*, page 397.

In the case of Reckendorfer *v.* Faber the court said (Mr. Justice Hunt delivering the opinion):—

" . . . 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. A stem-winding watch-key is another instance. The office of the stem is to hold the watch, or hang the chain to the watch; the office of the key is to wind it. When the stem is made the key, the joint duty of holding the chain and winding the watch is performed by the same instrument. A 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."

124. In Pickering *v.* McCullough the facts are so obscurely stated that little can be made out of them. The court, by the

[1] 104 U. S. 310.

The case of the Rubber-Tip Pencil Co. *v.* Howard (20 Wall. 498) really involved a question of combination, but the alleged invention therein described was treated by the court as a manufacture, — as an article simply, and not as a combination or aggregation, and its patentability was discussed solely from that point of view. We have therefore placed the case in the chapter on Ingenuity, where it will be found at page 247, *ante*.

mouth of Mr. Justice Matthews, after approving the two former cases, said: —

"In a patentable combination of old elements, all the constituents must so enter into it as that each qualifies every other.[1] To draw an illustration from another branch of the law, they must be joint tenants of the domain of the invention, seized each of every part, *per my et per tout*, and not mere tenants in common, with separate interests and estates. It must form either a new machine of a distinct character and function, or produce a result due to the joint and co-operative action of all the elements, and which is not the mere adding together of separate contributions. Otherwise, it is only a mechanical juxtaposition, and not a vital union."

125. Now, it may be gathered from these three opinions,[2] and especially from the last one, that in a patentable combination there must be a new interaction of some sort between the several elements. Or, to state the rule a little differently, it is not sufficient that one element is ineffective without the others, — that its function is useless, except in combination with other functions, — but the function of one must be modified in some way by the function of another, so that the function of one element is not the same in the combination that it was in the place whence it was taken; a *peculiar* function must be developed in the combination. This need not be true of every element in the combination, but it must be true of some one element or of several elements; and the virtue of the combination must inhere in this peculiarity of function developed by it.

126. A somewhat different rule may be drawn from the language of the court in Reckendorfer *v.* Faber, *supra.* We refer chiefly to the following passage: —

"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."

In other words, as we understand the proposition, the effect of the combination must be something more than, or different from, the sum of the several effects of the various parts.

[1] This is obviously an overstatement. It is sufficient if any two of the elements qualify each other, provided that the virtue of the combination resides chiefly in such qualification.

[2] But see Judge Blatchford's construction of the first two, *post*, page 404.

127. Both of these rules work well, as the reader will perceive, in the cases of Hailes *v.* Van Wormer and Reckendorfer *v.* Faber, properly excluding the combinations therein alleged to be patentable. So, also, in the case we are about to set forth, where the combination was patentable, the rules apply. It is that of Winans *v.* The Schenectady & Troy Railroad Co.[1]

128. In this case, the patentee had made an improved railroad-car by combining, in its running part, two four-wheel trucks (instead of the two-wheel trucks in use before) with a peculiar swinging bolster, under which they turned.

The result was that the four-wheel trucks could be placed one at each end of a long car (instead of toward the middle of a short car, as the two-wheel trucks, which they superseded, were placed), and they could, nevertheless, run on curves, though placed so far apart, because the bolster allowed them to turn under the car, and adjust themselves to the track.

In this manner the patentee made a car which was longer and larger, and which ran more smoothly, than any in use before it. Here, then, (1) there was a peculiarity of function brought out by the combination, and (2) the effect of the combination was something more than, and different from, the sum of the several effects of the two elements of the combination. One element was nothing without the other; the withdrawal of one would have paralyzed, so to say, the other. The swinging bolster, to be sure, would have been such on a two-wheel truck, but it would have been of no use there, for two-wheel trucks must run near together in order to support the car.

So, also, the four-wheel trucks would have been of no advantage without the swinging bolster; they must have been put near together in order to run on curves, and, so placed, they would have been no better than two-wheel trucks. In this case, therefore, the conditions stated in the two rules given above are fulfilled.[2]

129. We come now to a more difficult case, that of Williams *v.* The Rome, &c. Railroad Co.,[3] to which we have already referred. The patent was for an improved locomotive headlight-lamp, in which kerosene was the oil used. As in the stove case, all the

[1] 2 Blatch. 279.
[2] A similar case is that of Sarven *v.* Hall, 5 Fish. 415.
[3] 15 Blatch. 201.

devices of the combination were old; but, unlike the devices of the stove, they all united to produce a common result, namely, a flame of better quality than any obtained before by the burning of kerosene oil. In fact, the headlight made by the patentee was the first in which kerosene oil was used successfully. The case is an important one, and we set it out in full.

The object of the combination was to produce a light which should be brilliant, steady, and concentrated as nearly as possible in the focus of the reflector, which throws it forward of the locomotive.

The patentee thus described the result of the invention: "A lamp which is suitable for burning coal-oil in a locomotive headlight, and is more efficient for that purpose than any lamp heretofore known, because it furnishes the greatest quantity of light from a wick of a given size without material flickering."

130. The defence contended that the improved lamp was a mere aggregation of well-known devices, not a true combination. The devices were as follows (in number, five): —

"1. A circular, hollow wick-tube, having an interior and an exterior cylinder, which are separated by an annular space for the wick, but connected together at their lower ends so as to retain the oil. It was also furnished with a thimble wick-holder, by means of which the wick can be moved up as it burns.

"2. A perforated air-screen consisting of one or two cylinders of perforated metal, the inner cylinder being sustained by the wick-tube, and the outer by the inner. The object of this screen is to regulate the passage of air to the flame, to prevent flickering of the light.

"3. A cap-deflector supported by the inner perforated cylinder, composed of two parts, the lower cylindrical, the upper conical, with an orifice at the top, through which the flame issues. The cap-deflector extends above the wick when it is at its highest, and makes a combustion chamber above the wick in which the flame forms. A current of air comes up through the hollow wick-tube, and upon this current the flame is contracted so that a high degree of combustion is produced by the current of air which passes through the perforations of the air-screen into the cap-deflector.

"4. A button above the orifice of the cap-deflector to spread the flame. This button is supported by a stem, sustained in the middle of the wick-tube by perforated diaphragms, which also act as screens for the interior current of air.

"5. A lateral reservoir of oil placed behind the reflector of the head-

light, and feeding the wick by gravitation through a tubular passage into the wick-tube, there not being space enough for the reservoir between the wick-tube and the reflector."

131. The court, Blatchford, J., held that this was a valid combination, and not a mere aggregation of independent elements.

In giving his opinion, Judge Blatchford stated the case of Hailes *v.* Van Wormer and that of Reckendorfer *v.* Faber, *supra*, and he quoted the propositions laid down in the first case.

"The doctrine . . . is," he said, "that a new combination, if it produces new and useful results, is patentable, though all the constituents of the combination were well known and in common use before the combination was made; that the results, however, must be a product of the combination, and not a mere aggregate of several results, each the complete product of one of the combined elements; that merely bringing old devices into juxtaposition, and there allowing each to work out its own effect without the production of something novel, is not invention; and that no one, by bringing together several old devices without producing a new and useful result, the joint product of the elements of the combination, and something more than an aggregate of old results, can acquire a right to prevent others from using the same devices, either singly or in other combinations."

But he added: —

"These doctrines are not applicable to the present case. The flame of the lamp and its illuminating character, as to brilliancy, steadiness, size, and position is the result to which all the devices used contribute. They all co-operate to affect and modify such illuminating character of the flame of the lamp.[1] A locomotive headlight must be large, brilliant, steady, easy of adjustment as to the position of its wick, concentrated as nearly as possible in the focus of the reflector, and supplied freely with oil without interfering with the projection of the light forward, and without pumping mechanism. The circular, hollow wick-tube enables the light to be concentrated near the focus of the reflector. The perforated air-screen for the exterior current of air promotes the steadiness of the flame. The cap-deflector increases the volume and brilliancy of the flame. The lateral oil-reservoir supplying the oil by gravitation enables the light to be projected forward without interference, and also enables a wick of a given size and a chimney of a

[1] Judge Blatchford apparently understood the Supreme Court cases to imply that a combination is patentable if its elements produce a common result.

given height to insure the consumption of the maximum quantity of oil, and the production of the maximum quantity of flame. The button gives such shape to the flame that it is concentrated more nearly in the focus of the reflector. The thimble wick-holder enables the flame to be readily adjusted by raising or lowering the wick. The perforated air-screen for the interior current of air contributes to the steadiness of the flame, and so does the close chimney gallery. . . . There can be no doubt that the combinations made by the plaintiff were the results of invention, and were patentable. The evidence shows that they were the results of careful and patient investigation and experiment. His lamp was the first one which successfully burned kerosene oil in a locomotive headlight. He was successful in becoming able to employ the great brilliancy of an oil rich in carbon, under the peculiar and disadvantageous circumstances of burning it in a lamp in rapid motion and subject to great vibrations. The merit of his lamp is generally acknowledged. It has superseded those previously in use, and it is used on nearly all the railroads in the United States."

132. Here the legal conclusion is arrived at by working backward, so to say, instead of forward. The result is perceived to be a new thing; hence the conclusion is fair that the mode of operation is new, although, considering the separate elements, without regard to the result, it may be impossible to see that one modifies another, or that the total effect was anything more than or different from the sum of the separate effects.

It might be objected that this is only a way of saying that the aggregation was a good and successful one. The result of adding one improvement to another was indeed a lamp better than any which had preceded it; but, none the less, it was a mere aggregation, because each element discharged its office no otherwise than it would have done had it been used without the others. In a certain sense, every new aggregation must result in a new thing. There is some force in this argument, and it might seem that the line to be drawn between this case and that of Hailes *v.* Van Wormer is a narrow one. But, as we have seen, in the stove case the separate elements did not contribute to a common result; whereas in the headlight case the elements did so contribute, and the result was an entirely new one, namely, a headlight lamp that would burn kerosene oil successfully. And this new result implies a new mode of operation, fairly enough; for if the mode of operation, by which we understand the working of the various

elements, considered as an entity, to which entity each element has contributed its part, — if this was not new, how could the result be new?[1] If the mode of operation here was the same as that in other combinations for the same purpose, it could not have succeeded where the others failed.

The truth is that the Supreme Court, in the opinions which we have been considering, left out of view this sort of combination, in which the separate parts cannot be said to have any operation by themselves, because the operation of the parts is entirely lost in the operation of the whole. We cannot compare these cases with those like the pencil case, where each element is entirely independent of the other; nor even with those like the car case or the stove case, where each element, though useless without the other, has yet a separate action, which can separately be observed and considered. In the stove case and in the car case we can perceive to what extent one element acts upon, assists, or effects the other; but in the lamp case it is impossible to do so. In that case (and we take it as a type) it may be that the new result was attained because the patentee had picked out from several lamps the best single part in each, or because the parts which he selected, and his arrangement of them, produced some new interaction, one part modifying or enabling another. It would be impossible to say which of these suppositions is the true one. Moreover, in these cases it is commonly unnecessary to make such an inquiry, for if the combination produce a new mode of operation, it is immaterial whether that be due to the excellency of the separate parts, or to some peculiarity of function developed by the combination.[2]

[1] Different results argue substantial change in the mode of operation. Mr. Justice Curtis, in Forbush *v.* Cook, *supra;* and Woodbury, J., in Davoll *v.* Brown, 3 West. L. J. 151.

[2] We append some additional remarks upon the criterion which we have spoken of already as set forth by the Supreme Court in the case of Reckendorfer *v.* Faber, *supra.* To repeat it, according to our understanding of it: —

The effect of the combination must be something more than, or different from, the sum of the separate effects of the several elements. The application of this test is plain enough in the pencil case. In the car case, which we take as the type of many others, it is not quite so plain; for it cannot be said that either of the elements there has any effect when taken by itself. So of the lamp, a tube or an oil-reservoir has no effect taken by itself; that is, it is useful only when employed with other devices. But each of these elements has a *function* which it discharged in the combination from which it was taken by the patentee.

We will take the car case first.

To take an extreme case, however, we may suppose a lamp made up of old devices newly combined, which, though it burns as well, burns no better, and is not cheaper than other lamps previously in use. In such a case there would be no new result from which to infer a new mode of operation, and therefore we

Supposing the patentee to have found the four-wheel truck in use without the bolster, and the bolster in use with a two-wheel truck, then the office of the four-wheel truck was only to support half of the car in a position remote from either end thereof, whereas its peculiar function was to support a long car by the ends thereof.

And the peculiar function of the bolster, which was to allow the truck on which it rested to move laterally, was of no use with the two-wheel truck and, consequently, short car. These, then, were the *separate* effects of the two elements; that is, all the effects they had, or could exercise successfully, when used apart from each other. The peculiar function of the truck was not called out at all, and the peculiar function of the bolster was used without advantage. But when the bolster and the truck were combined by the patentee, a new effect was called forth. One enabled the peculiar function of the other to be exercised. The capability of the four-wheeled truck to support a great weight, and the swinging capability of the bolster, came into play. The effect, therefore, of their combination was something different from the sum of their separate effects.

It is true that it was not different from the sum of their possible functions, — their latent functions, so to say, — which were drawn forth by their combination. But in considering their separate effects, we must take them as the patentee found them; and as he found the two elements, their latent effects had no actual operation.

In the lamp case there is a difference. The several elements were selected from as many lamps. Now, there is nothing *except the result* to show that in their new situation they played any different part from that which they had in their old positions. They may have failed to make as good a lamp in the old combinations, because the other elements with which they were there combined were defective.

In this case there was certainly no latent function in each element called forth by the combination. One did not depend for its usefulness upon another; that is, the reservoir, for instance, did not depend upon the peculiar character of the tube (as the bolster depended upon the four-wheel truck). So far as the reservoir is concerned, it may have been just as good in its old combination as in the new. On the other hand, it may be that the several elements of the lamp, though they did not call out any new function in each other, still assisted each other, were adapted to each other to such an extent that the operation of each separate element was somewhat different in the new combination from what it was in its old situation.

The rule, then, that a new combination, to be patentable, must produce an effect more than, or different from, the sum of the separate effects of the several elements as they existed in the places whence they were taken, cannot always be applied.

There may be a new result and a new mode of operation, although the co-action of the elements is perceptible in the new result only.

should be forced to inquire whether any new interaction was obtained by the combination; and if such interaction was not perceptible, there would be a strong probability, if not a certainty, that invention was not exercised in putting together the constituents of the new lamp, — that the lamp was a mere aggregation, not a true combination.

133. Recurring to the headlight case, if the question be asked, How is *invention* shown in putting together well-known lamp devices so as to make a more effective lamp? we reply, that the *selection*[1] amounted to invention.

It is not invention to improve an article by adding to it one well-known element after another, simply because each is good in its way. Here there is no adapting, harmonizing, and balancing of effects to produce a desired result; there is simply addition of effects.

But given an ideal article, — an article that shall have certain properties, or that shall have them to a certain degree, theretofore unknown, — may there not be invention shown in selecting such known elements as shall produce the desired result; elements that shall best perform the office needed of each, and so adapted one to another, so balanced and harmonized, that the resulting article or process fulfils the required conditions?[2]

The present case we conceive to be such a one.

Viewing it in this light, it becomes material to consider how much labor and thought were required to make the improvement; for in so far as the result was difficult to arrive at, so far is it likely that its production required invention as well as care. And this consideration was not overlooked by the court.

134. To recapitulate: —

A combination to be patentable must produce a new mode of operation, if it has any mode of operation; and of such new mode of operation a new result is decisive evidence, though not the only evidence.

If the combination is, so to say, an inert article, as a compound, or a piece of furniture, so that it cannot be said to have

[1] *Vide* the Introduction, *ante*, page 31.

[2] Woodruff, J., in Gallahue *v.* Butterfield, *ante*, page 340: —

"It is not true of machines, as such, that because every one of its members performs in it the identical office which it would perform, however used, the conjoint action in their new combination may not produce a result new and useful, and never before attained," and patentable.

any mode of operation, then no *test* of invention can be proposed. We are referred directly to the fundamental inquiry, Was invention required to conceive the idea of putting together the elements of the combination, or was it shown in the device or devices by means of which they were put together?

We hesitate, however, to say that every combination which produces a new mode of operation is patentable.

135. The question next arises, What is a new mode of operation, and what is a new result?

As we have seen, mere contiguous and simultaneous action of separate parts in one device or mechanism, the whole producing no common and no new result, though each part contributes to the efficacy of the device or mechanism, does not amount to a new mode of operation. Such was the action of the parts in the case of Hailes *v.* Van Wormer; so also in the case of Reckendorfer *v.* Faber, — except that in the last case the action of the parts was not simultaneous. But it is not a sufficient objection to the patentability of a combination that its parts operate successively, not simultaneously.[1]

136. If, however, the combination produces a peculiarity of function in one or in several of its elements, and the virtue of the combination resides in such peculiarity of function; or if the total effect of the combination is something more than, or different from, the sum of the several effects of the elements, — then there is a new mode of operation, and the combination will fulfil the severest test of invention proposed by the Supreme Court or by any other court. The Winans Car case and the case of Sarven *v.* Hall (*post*, page 435) may be taken as illustrations.

137. If, again, no such peculiarity of function or total effect can be perceived except from the result, still, if the several elements of the combination unite to produce a common result, and that result is a new one, then a new mode of operation is presumed, and there is a strong presumption of invention. This was the lamp case.[2]

138. Finally, if in a case like that of the lamp there is no new

[1] *Vide* the cases cited at page 396, *ante*.

[2] The reader is again reminded that a stricter doctrine may be drawn from the *dicta*, though it is not required by the decisions of the Supreme Court.

result, but only a better or cheaper result, an improvement in degree simply, then we are referred to the ultimate inquiry in all cases of patentability, namely, was there *invention* in the improvement?[1]

In the case supposed, this question would be asked: Did the maker of the new lamp exercise merely the skill of a mechanic in picking out one device rather than another from the various lamps with which he was familiar; or did the *selection* amount to invention? Or, again, was there invention, if not in the selection, yet in the manner by which the devices selected were adjusted and fixed in the new combination?

139. The last remark applies to all kinds of combinations, and should qualify what has been said by way of definition; for there may be no invention in the idea of bringing together certain elements, and yet invention may be required to adjust them in the new combination. This certainly is not often the case, but the contingency exists.[2]

It is possible, in fact, to imagine a combination the several elements of which were associated in thought without invention, and produced, when so associated, no new mode of operation and no new result, although invention was shown in adjusting them. The combination would, of course, be patentable; and although such an invention would not, strictly speaking, be a case of combination, it would probably be considered as such.

140. In truth, all the various criteria that we have examined are but aids, and often very slight aids, to the final inquiry, Is there invention in the improvement?[3]

Mr. Chief Justice Taney thus defined a patentable combination:—

"The patent is for a combination; and undoubtedly it is patentable if the combination is new, although the elements which compose it may be old, provided it was *invented* by the complainant, and is not the

[1] The case of Mahn *v.* Harwood (14 O. G. 859), *post*, page 462, illustrates this proposition.

[2] Hoe *v.* Cottrell (18 O. G. 59), *post*, page 472, would seem to be an instance.

[3] Since this chapter was written, the case of the Loom Co. *v.* Higgins has been reported (105 U. S. p. 591, *post*, page 475). In that case the Supreme Court say:—

"It may be laid down as a general rule, though perhaps not an invariable one, that if a new combination and arrangement of known elements produce a new and beneficial result never attained before, it is evidence of invention."

mere effort of ordinary mechanical skill, putting together known powers and combinations to produce the result." [1]

What is meant by "invented" we have tried to show in the Introduction to, and in the first chapter of, this book.[2]

WHITTEMORE *v.* CUTTER, 1 GALL. 478.

D. OF MASS., 1813. STORY, J., AND A JURY.

Patent for a machine to make cotton and woollen cards.

Story, J.: —

". . . The jury then are to decide whether the principles of Mr. Whittemore's machine are altogether new, or whether his machine be an improvement only on those which have been in use before his invention. . . . The principles are the *mode of operation*. If the same effects are produced by two machines by the same mode of operation, the principles of each are the same. If the same effects are produced, but by combinations of machinery operating substantially in a different manner, the principles are different.

[1] Crosby *v.* Lapouraille, Campbell, 374 (1854).

[2] In the English case of Harrison *v.* Anderston (L. R. 1 App. Cas. 574), the Lord Chancellor (Lord Cairns) thus described a patentable combination: —

"This combination . . . is novel; it is, to use the words of the Lord President [of the Scottish Court of Session], a new combination of old parts to produce a known result in a more useful and beneficial way. It is not doubted that a combination of which this may be said is the subject of a patent."

Murray *v.* Clayton, L. R. 7 Ch. 577 (1872). Sir James Bacon, V. C., in the course of his judgment in this case, said: —

"A combination of things not in themselves new, but which combination is perfectly new in the form in which the inventor has cast it, and producing new and more beneficial results, may be the subject of a patent. Huddart *v.* Grimshaw, Web. P. C. 85. But I am aware of no case in which it has been held that the mere arrangement of common elementary mechanical materials, and the construction, by means of such arrangement, of a machine which produces no other result than that which had been previously accomplished by other mechanical arrangements and construction, would support a patent. If it were so, there would be no protection to the public or to earlier patents against the ingenuity of any artisan who might have the skill to arrange the old mechanism in a new shape, and thereby to appropriate to himself the fruits of previous inventors, in the proper sense of that term, so that the privilege and reward which the law only concedes to art and wit and invention might be bestowed upon mere skill in handicraft."

"The great stages (if I may so say) in making the cards by Whittemore's machine, which admit of a separate and distinct operation in the machinery, are: 1. The forming and bending the wire; 2. The pricking the leather; and, 4. The crooking the wire after its insertion. Were either of these effects produced in the machines formerly in use by a combination of machinery or mode of operation, substantially the same as in this machine? If so, then clearly his patent could only be for an improvement, and of course it is void; if not, then his patent is free from any objection on the ground of being broader than his invention. It will not be sufficient to protect the plaintiff's patent that this specific machine, with all its various combinations and effects, did not exist before; for if the different effects were all produced by the *same application* of machinery, in separate parts, and be merely combined then together, or added a new effect, such combination would not sustain the present patent, any more than the artist who added the second hand or repeater to a watch could have been entitled to a patent of the whole watch."

PENNOCK *v.* DIALOGUE, 4 WASH. 538.

D. OF PENN., 1825. WASHINGTON, J., AND A JURY.

A patent for improvement in leather hose. The improvement consisted in lapping the edges of the leather so as to form a double thickness at the seam, and then connecting them with metallic rivets and bars; the pressure of the fluid upon the inner lap or edge of the leather increasing the tightness of the seam. There was evidence of a harness, the parts of which were fastened by metallic rivets and bars; and of an Indian scabbard made of sole leather, the edges of which did not lap, but were united by lead rivets.

Washington, J., charged the jury that it was for them to say whether these prior contrivances were,

"in form, structure, or principle, the same thing as the hose for which this patent was granted. It is true that in the construction of these articles leather and metallic rivets were employed; but it is clear law, that if old materials and old principles in mechanics, or otherwise, are used in a state of combination, so as to produce a new result, the inventor of the article so produced . . . may obtain a valid patent."

Similar instructions were given in regard to two prior kinds of leather hose. The first had lapping edges fastened by clinched

nails; and the edges of the other were fastened by rivets and bars, but it did not clearly appear whether they lapped or not.

RYAN *v.* GOODWIN,[1] 3 SUMNER, 514.

D. OF MASS., 1839. STORY, J., AND A JURY.

Patent for a new composition for matches, consisting in phosphorus, chlorate of potash, sulphuret of antimony, and gum-arabic or glue. The proportions of the ingredients and the manner of combining them were stated in the patent.

In his charge to the jury, Story, J., said : —

" . . . It is certainly not necessary that every ingredient, or, indeed, that any one ingredient, used by the patentee in his invention should be new or unused before for the purpose of making matches. The true question is, whether the combination of materials by the patentee is substantially new. Each of these ingredients may have been in the most extensive and common use, and some of them may have been used for matches, or combined with other materials for other purposes. But if they have never been combined together in the manner stated in the patent, but the combination is new, then, I take it, the invention of the combination is patentable. . . . The combination is apparently very simple; but the simplicity of an invention, so far from being an objection to it, may constitute its great excellence and value. Indeed, to produce a great result by very simple means, before unknown or unthought of, is not infrequently the peculiar characteristic of the very highest class of minds."

There was also a claim in the patent for a method of putting up the matches in slabs of paper, to avoid the danger of friction. This was objected to as frivolous; but it was not noticed in the opinion.

[1] Sometimes called Byam *v.* Goodwin.

DAVOLL *v.* BROWN, 4 WEST. L. J. 151.[1]

D. OF MASS., 1845. WOODBURY, J., AND A JURY.

The patent was for "speeder, double speeder, and fly-frame, used in roving cotton."

"The facts were that a single row of American flyers, driven by a particular gearing, was known, and that double rows of open flyers were known. The plaintiff borrowed from the latter the idea of two rows, and from the former the arrangement of gearing, and making some new additions to the gearing, to adapt it to the two rows, made a double row of American flyers."

Woodruff, J., charged the jury that the new combination, to be patentable, must be useful; that the combination

"must be substantially new; that to be so, the parts may have been used before; that it was the bringing of them together in a new manner that constituted the invention; that it was not necessary to have any new power or substance, but that it was necessary that it should be a combination operating in a new mode or manner; that this constituted the new principle; that if the new mode was merely changed in equivalents, and there was no new result, it was not enough; but that if there was any new mode of operating, then it was new; that it was better to look at great results than to the opinions of witnesses; that if results were different, it argued substantial change in the mode; that the results could not be different, if the means were the same," &c. Verdict for the plaintiffs.[2]

BUCK *v.* HERMANCE, 1 BLATCH. 398.

N. D. OF N. Y., 1849. NELSON AND CONKLING, JJ.

Patent of D. Buck, dated May 20, 1839.

The report says: —

"The invention of Buck consisted in taking the stove known as the Hathaway stove, — in which the oven was extended under the apron or open hearth of the stove, and which had what are called reverberating flues, that is, two flues starting from the top of the back of the stove, one at each side, running down the back and under the bottom to the

[1] The report in the Law Journal is taken from "The Boston Atlas."

[2] There is a copy of the specification in 1 Wood. & M. p. 54.

front, and there uniting in a centre flue which returned under the bottom and up the back to the stove-pipe, — and adding to it a close flue or fire-chamber in front, between the front plate of the stove and the front plate of the oven. Into this fire-chamber, which had no opening except into the flues under the bottom of the oven, the smoke and gases generated by combustion entered, and in it they circulated before returning through the centre flue. By this means the front part of the oven was more effectually heated, and a more uniform baking in all parts of it was ensured. In the Buck stove, the dividing strips between the side flues and centre flue under the bottom did not extend quite to the front plate of the stove."

Nelson, J.: —

" . . . The construction of the claim on which the court have agreed is this, that the invention of the patentee is a combination of the extension of the oven under the hearth of the stove, and the flues as described by him, with the flue or fire-chamber in front of the stove, formed by the two front plates. . . . The combination of the extended oven and reverberating flues, meaning the side flues and the centre flue, was old; but it is claimed on the part of the patentee that he has brought into connection with this old combination another element, the flue in front. . . . If that element was never before used in combination with the extended oven, and the patentee was the original inventor of it, then, in our view, it is a new combination, and, if useful, patentable. . . . In a patent for a combination where the novelty of the invention consists in the combination, it is altogether immaterial whether the elements forming the combination are new or old. All may be old; but if they are brought together in a combination which was never before known, and practically produces a new and useful result, it is a patentable subject. . . . A formal difference between the combination of Buck and any previous combination is not patentable, and involves no skill, ingenuity, or mind. It is simply a difference in mechanical construction. In order to be patentable, the change must be substantial, as contradistinguished from formal. The new article must be different from the article on which it is claimed to be an improvement, not only in its mechanical contrivance and construction, but in its practical operation and effect in producing the useful result. Then it is not formal. Then it requires mind, ingenuity, labor, time, and expense." Verdict for the plaintiffs.

The same patent was upheld by McLean, J., in the case of Buck *v.* Gill, 4 McLean, 174.

LARABEE *v.* COURTLAN, 3 Fish. 5.

D. of Md., 1851. Taney, C. J., and a Jury.

A patent for an improvement in shower-baths, being a combination of the jet-bath and movable reservoir.

In the jet-bath an upright tube comes from the reservoir overhead, with lateral branches, curved, so that the bather stands within them, and the water falls first upon his body and not upon his head. Both the jet-bath and the movable reservoir were old, and so was the combination of jet-bath and *fixed* reservoir.

The judge, therefore, charged as follows: —

"If . . . the plaintiff's mode of connecting and combining the jet-bath with the movable reservoir, and supplying the jet with water from the reservoir, is substantially the same with that by which the jet-bath and fixed reservoir were united together in the old improvement, or if a mechanic of ordinary skill and acquainted with such business, with the old improvement before him, could have attached the jet-bath to the movable reservoir in a manner that would produce the same result with that adopted by the plaintiff, then the improvement he claims to have invented is not patentable, and his patent is invalid."

WINANS *v.* THE SCHENECTADY & TROY RAILROAD CO., 2 Blatch. 279.

N. D. of N. Y., 1851. Nelson, J.

Winans's patent.

The ordinary railroad-car in use before Winans's invention had four wheels, and the two axles were placed from three and one-half to five feet apart. If the axles were placed near together, the car was badly jarred whenever the wheels passed over elevations or into depressions in the track. On the other hand, if the axles were far apart, one at or near each end of the car, there was a great increase of friction between the flanges of the wheels and the rail, when the car was moving upon a curve; just as it is more difficult to turn a corner with a long wagon than with a short one.

The specification said : —

" When the cars are so constructed that the axles retain their parallelism, and are at a considerable distance apart, there is a necessary tendency in the flanges of the wheels to come into contact with the rails, especially on the curvatures of least radius [sharp curves, in other words], as the axles then vary more from the direction of the radii," *i. e.* lines perpendicular to the curve.

A compromise, therefore, was usually made between the two evils, by placing the axles neither close together nor far apart.

Winans's improvement combined the advantages of both arrangements. He constructed two bearing-carriages of four wheels each. The fore and hind wheels of each carriage were placed as near together as they could run without actual contact ; and a strong spring connected the fore and the hind wheel on each side,

" the ends of which springs are bolted, or otherwise secured, to the upper sides of the boxes, which rest on the journals of the axles, the longer leaves of the springs being placed downwards and surmounted by the shorter leaves. . . . Having thus connected two pairs of wheels together, I unite them into a four-wheel bearing-carriage, by means of their axles and a bolster of the proper length extending across, between the two pairs of wheels, from the centre of one spring to that of the other, and securely fastened to the tops of them. This bolster must be of sufficient strength to bear a load upon its centre of four or five tons. Upon this first bolster I place another of equal strength, and connect the two together by a centre pin or bolt, passing down through them, and thus allowing them to swivel or turn upon each other in the manner of the front bolster of a common road-wagon."

The body of the car was twice as long as that of an ordinary car, and able to carry twice as heavy a load. Its whole weight rested upon the upper bolsters of the bearing-carriages.

" I sometimes place these bolsters so far within the ends of the body of the car as to bring all the wheels under it, and in this case less strength is necessary in the car-body than when the bolster is situated at its extreme ends. In some cases, however, I place the bolster so far without the body of the car, at either end, as to allow the latter to hang down between the two sets of wheels or bearing carriages, and to run, if desired, within a foot of the rails. . . . I do not claim as my invention the running of cars or carriages upon eight wheels, this having been previously done ; not, however, in the manner and for the pur-

poses herein described, but merely with a view of distributing the weight, carried more evenly upon a rail or other road, and for objects distinct in character from those which I have had in view, as hereinbefore set forth; nor have the wheels, when thus increased in number, been so arranged and connected with each other, either by design or accident, as to accomplish this purpose. What I claim, therefore, as my invention, . . . is the before-described manner of arranging and connecting the eight wheels, which constitute the two bearing-carriages, with a rail-road car, so as to accomplish the end proposed by the means set forth, or by any others which are analogous and dependent upon the same principles."

Winans, by thus suspending, so to say, his car between the two bearing-carriages remote from each other, obtained for it immunity from jarring caused by elevations and depressions in the track, and also

"by the contiguity of the fore and hind wheels of each bearing-carriage [*which thus operated as one wheel*], and the swivelling motion of the trucks or bearing-carriages, the planes of the flanges of the wheels conform more nearly to the line of the rails, and the lateral friction of the flanges on the rails, while entering, passing through, and leaving curves, is thereby diminished. Moreover, the car rode more easily, because it rested only on the centre of the bolsters."

The case was tried before Conkling, J., and a jury. A verdict being given for the plaintiff, the defendant moved for a new trial, which was refused by Nelson, J., who said: —

". . . Most of the exceptions taken at the trial, and relied on in the argument here, are founded on what we regard as an entire misapprehension of the thing . . . for which the patent has been issued. . . . They assume that if any material part of the arrangement and combination in the construction of the cars or carriages described in the patent was before known or in public use, it is invalid; . . . now, the answer to all this class of exceptions is, that the patentee sets up no claim to the discovery of the separate parts which enter into his arrangement in the construction of his cars. These may be old and well known, when taken separately and detached, for aught that concerns his invention. His claim is for the car itself, constructed and arranged as described in his patent. . . . The argument presupposes that the claim is for the discovery of a new combination and arrangement of certain instruments and materials, by means of which a car is constructed of a given utility; and that if any one or more of the supposed

combinations turns out to be old, the patent is invalid. This is the principle upon which much of the defence has been placed; but no such claim is found in the patent. No particular combination or arrangement is pointed out as new, or claimed as such. The novelty of the discovery is placed upon no such ground. On the contrary, the result of the entire arrangement and adjustment of the several parts described, namely, the railroad car complete and fit for use, is the thing pointed out and claimed as new. This is the view taken of the patent by the Chief Justice in the case of the present plaintiff against the Newcastle and Frenchtown Turnpike and Railroad Company, tried before him in the Maryland Circuit, and which was adopted by the judge on the trial of this case."

Other exceptions were to a charge that the relative position of the bearing-carriages was a material part of the invention, to the admission of a certain drawing, &c.

The case affords a capital instance of a conjunction of mechanical elements amounting to a real combination in the patent-law sense of the term; and it is the more noteworthy, because the putting together of mechanical contrivances on a large scale does not often result in anything more than aggregation.

WINANS *v.* EATON, 1 Fish. 181.

N. D. of N. Y., 1854. Nelson, J.

Nelson, J., refused an application for a preliminary injunction. The defendants introduced evidence to prove that Winans's car was not new. They relied chiefly on the "Quincy car." It was built in 1829, and used on a railroad, about four miles long, running from the granite quarries in Quincy, Massachusetts, to a wharf in Milton.[1] This car was constructed by one Bryant.

Nelson, J., said: —

". . . Bryant states . . . that the objects of the construction were to carry a large load on the eight wheels without injury to the road; to turn the curves freely, descend the inclined plane, and run on the road carrying the stone as smoothly and safely as possible. It consisted of two four-wheel trucks, securely held by centre pivots or king-bolts about ten feet apart, which passed through the bolsters of a

[1] This is said to have been the first railroad in the United States.

rigid body or platform framing and the centres of the trucks. The body, with its bolsters thus secured by the vertical king-bolts, had side-bearings on curved plates on the trucks, and the truck swivelled under them to conform to the curves and switches or turnouts of the road, while the body connecting the trucks sustained and carried the load smoothly and safely. That the trucks consisted of rigid, rectangular wheel-frames, with the double-cross bolsters, and held the bearing-points of the wheels on the rail, the same distance apart as the gauge of the track, which was five feet.

"He further observes that this car contained a combination of the two four-wheel trucks, — rigid wheel frames with a permanent body to carry the load by means of vertical king-bolts, allowing the two trucks to swivel to conform to the curve of the road, the same in principle of construction and operation as the eight-wheeled cars now in general use on railroads in the United States."

Also a model of a steam-carriage, used in 1833 in South Carolina (not described in the report), was introduced in evidence by the defendant.

The court said: —

"I do not find that this evidence was before the court and jury in the former trial upon this patent. Although it may not be regarded (looking at the particular construction and purpose of this steam-carriage) as bearing so directly upon the novelty of the Winans car, or, speaking perhaps more accurately, as showing the principles and arrangements of the defendants' cars to have been discovered and applied before the date of the Winans improvement, it is undoubtedly entitled to a good deal of consideration, and, as the case now stands, sufficient, at least, in connection with the 'Quincy car,' to forbid the granting of the injunction."

And he continued: —

"... The defendants have also given in evidence a model of a carriage for railways and roads, described by W. & E. W. Chapman in their patent granted in England in 1812. The specification is published in the 24th volume of the 'Repertory of Arts,' &c., under the date of February, 1814, with drawings. Fig. 8, says the patentee, shows a carriage of six wheels for the engine, which may rest equally, or nearly so, on each of its wheels, and move freely round the curves or past the angles of a railway; 1, 1, the fore-pair of wheels are, as usual on railways, fixed to the body of the carriage; 2, 2, and 3, 3, the other two pair [*sic*], are fixed on axles (parallel to each other) to a separate frame, over which the body of the carriage should be so poised as that two-

thirds of its weight should lie over the central point of the fore-wheels where the [pivot?] 4 is placed; and the remaining third over the axis [axle] 1, 1. The two-thirds weight of the carriage should rest on conical wheels or rollers, bearing upon the curved plates 1, 1, so as to admit the ledges of the wheels, or those of the way, to guide them on its curves or past its angles by forcing the transom or frame to turn on the pivot, and thus arrange the wheels to the course of the way, similar to the carriage of a coal-wagon; and the patentees add: *If the weight of the locomotive engine should require eight wheels, it is only requisite to substitute, in place of the axis* [*axle*] 1, 1, *a transom such as described, laying the weight equally upon both, and then, similarly to two coal-wagons attached together, the whole four pair of wheels will arrange themselves to the curves of the railway.* . . . This description and drawing of the Chapman car . . . were before the court and jury in the former trial [Winans *v.* Schenectady & Troy R. R. Co., *ante*, page 416]; but as the novelty and improvement of the plaintiff's patent were left, as questions of fact, to the jury, the subject was not a matter of particular examination on the motion for a new trial."

WINANS *v.* NEW YORK & HARLEM RAILROAD CO., 4 Fish. 1.

S. D. of N. Y., 1855. Nelson, J., and a Jury.

Nelson, J., in charging the jury, gave the same construction to the patent that he had given to it theretofore, saying: —

"The claim itself explains the improvement set up by the patentee. It is the arrangement and construction and adjustment of the eight-wheeled car, as described in his specification, the *car as a whole.*"

On the score of abandoned or incomplete invention he said: —

"Now, the circumstance that a person has had an idea of an improvement in his head, or has sketched it upon paper, — has drawn it, and then gives it up, rejects it, — does not, in judgment of law, constitute, or have the effect to constitute, him a first and original inventor. It is not the person who has only produced the idea that is entitled to protection as an inventor, but the person who has embodied the idea into a practical machine, and reduced it to practical use. He who has first done that is the inventor who is entitled to protection.

"A kindred principle, also, it may be proper to state here, which is, that where a person engaged in producing some new and useful

instrument or contrivance, and who has embodied it into a machine, and endeavored to reduce it to practice by experiments, — if these trials fail, if he fail in success and abandon it or give it up, the consideration affords no impediment to another person who has taken up the same idea or class of ideas, and who has gone on perseveringly in his studies, trials, and experiments until he has perfected the new idea and brought it into practical and useful operation. He is the person — the meritorious inventor — who is entitled to the protection of the law."

The evidence on these points is not reported.

WINANS *v.* NEW YORK & ERIE RAILROAD CO., 21 How. 88 (1858).

The Winans patent came before the Supreme Court on exceptions to the charge, and refusals to charge, of Judge Hall in the case of Winans *v.* New York & Erie R. R. Co., 1 Fish. 213.

The court, Grier, J., delivering the opinion, sustained the construction put upon the patent by Hall, J., remarking that it was the same as that given by Mr. Chief Justice Taney in 1839, and by Mr. Justice Nelson, as we have already seen; and they quoted from Judge Hall's charge as follows: —

"The . . . improvement consists in *the manner of arranging and connecting* the eight wheels which constitute the two bearing-carriages with a railroad car, the object of which is to make such an adjustment of the wheels, axles, and bearings of the car as shall enable a car with a comparatively long body to pass curves with greater facility and safety and less friction; and as shall at the same time cause the body of the car to pursue a more smooth, even, direct, and safe course over the curvatures and inequalities and over the straight parts of the road. . . .

"The leading principle set forth in the specification, upon which the arrangement and connection act to effect the objects aimed at, is that by the contiguity of the fore and hind wheels of each bearing-carriage and the swivelling motion of the trucks or bearing-carriages, the planes of the flanges of the wheels conform more nearly to the line of the rails, and the lateral friction of the flanges on the rails, while entering, passing through, and leaving curves, is thereby diminished; while, at the same time, in consequence of the two bearing-carriages being arranged and connected with the body of a passenger or burden car by means of the king-bolts or centre-pins and bolsters, placed as remotely

from each other as may be desired or can be conveniently done, and with the weight bearing upon the *central* portion of the bolsters and bearing-carriages, the injurious effects of the shocks and concussions received from slight irregularities and imperfections of the track and other minute disturbing causes are greatly lessened."

FORBUSH *v.* COOK, 2 Fish. 668.

D. of Mass., 1857. Curtis, J., and a Jury.

The patent was for an "improvement in the power-loom for weaving figured fabrics."

"The particular claim" (we quote from the report) "which was alleged to have been infringed by the defendants was for a combination of a pattern cylinder, with double-hooked jacks, and a lifter and depressor, which were described as so constructed and arranged that the pattern cylinder, in the act of revolving and presenting a section of the pattern, pressed by its projections, which corresponded with the section of the pattern, upon such of the jacks as were required to be raised, and pushed these jacks into a position to have one set of their hooks caught by the elevator, the other jacks not thus acted on remaining in a position to have the other set of their hooks caught by the depressor, the elevator and depressor rising and sinking and carrying with them the required jacks thus disposed to receive their action; the shed of the warp being thus opened both ways simultaneously, the threads necessary to form the figure being disposed in the upper part of the shed."

Curtis, J.: —

" . . . It has not been denied that in point of fact he [the patentee] first combined the pattern cylinder of the witch loom with the double-hooked jacks and elevator and depressor of the Jones and Milldun loom; but some witnesses have testified that, in their opinion, it did not require invention to devise this combination. Other witnesses have expressed the opposite opinion. The true inquiries for you to make in this connection are, whether the combination made by the patentee was new and useful. If it was a new and useful combination within the meaning of the patent law, it was the subject-matter of a patent; and it is not important whether it required much or little thought, study, or experiment to make it, or whether it cost much or little time or expense to devise and execute it. If it was a new and useful combination of parts, and he was the first to make the combination, he is an inventor, and may have a valid patent.

"When I say it must be new, I do not refer to the materials out of which the parts are made, nor merely to the form or workmanship of the parts, or the use of one known equivalent for another. These may all be such as never existed before in such a combination; and yet the combination may not be new in the sense of the patent law. To be new in that sense, some new mode of operation must be introduced. And it is decisive evidence, though not the only evidence, that a new mode of operation has been introduced if the practical effect of the new combination is either a new effect or a materially better effect, or as good an effect more economically attained by means of the change made in the combinations of the patentee. A new or improved or more economical effect, attributable to the change made by the patentee in the mode of operation of existing machinery, proves that the change has introduced a new mode of operation which is the subject-matter of a patent; and when this is ascertained, it is not a legitimate subject of inquiry at what cost to the patentee it was made, nor does the validity of the patent depend on an opinion, formed after the event, respecting the ease or difficulty of attaining it."

POTTER *v.* HOLLAND, 4 BLATCH. 238.

D. OF CONN., 1858. INGERSOLL, J.

A. B. Wilson's reissued patents, numbered respectively 346 and 414.

Wilson claimed the combination in a sewing-machine of a table to support the material to be sewed, a sewing mechanism, and an automatic "feed," or device for moving the cloth to be sewed. The last-named only of these was new; and it was contended by the defendants that, other feed-motions having been used before in other combinations for the same purpose, the patentee could not obtain a valid patent for his combination, but only for that part of it which he had himself invented.

The court, however, held that the combination was patentable, inasmuch as the new element was not an improved form of the old devices used for the same purpose, but an essentially new device.

"It was not something in aid of the old mode, and to make the use of any old mode better. It dispensed with and discarded the old modes, and substituted in their place other means to accomplish a useful result."

The other point decided in this case was as to the validity of the fourth claim of Wilson's patent, which was for so attaching one of the feeding-surfaces to some other part of the machine that it might, at the will of the operator, be drawn away from the other surface. The device is not particularly described in the report. The feeding-surfaces are useful, said the court. This device makes them more effective; therefore it is useful, and, if useful (and new, which was admitted), patentable.

LEE *v.* BLANDY, 1 BOND, 361.

S. D. OF OHIO, 1860. LEAVITT, J., AND A JURY.

Leavitt, J.:—

"There are two classes or kinds of combinations recognized by our patent laws which are properly the subject of a patent. The first may be defined to be one in which all the parts were before known, and where the whole merit of the invention consists in such an arrangement of them as to produce a new and useful result, or where, by adopting parts of a machine which may have been known for ages, an inventor has succeeded in making such an arrangement of them as that they produce a result never before obtained, and have, in that point of view, the merit of originality, and are therefore patentable.

"There is another class of combinations, where *some* of the parts or elements of the combination are new, and their invention claimed, but where they are used in combination with parts or elements that were known before."

Also *held*, that a contract which the defendants had formerly made with the plaintiff, for the right to use the plaintiff's invention, might go to the jury as evidence of its utility.

EMIGH *v.* CHICAGO, BURLINGTON, & QUINCY RAILROAD CO., 1 BISS. 400.

N. D. OF ILL., 1863. DRUMMOND, J.

F. A. Stevens's patent of Nov. 25, 1851, for an improvement in railroad car-brakes.

The claim was for

"the combination and arrangement of the levers, link-rods, and shoes or rubbers, substantially as herein described, whereby each wheel of

both trucks of a car is retarded with a uniform force when the brake is put in operation."

"Stevens's improvement," says the report, "consisted of the addition of an intermediate lever, with which the brake-beam of each truck was connected, the two inner levers of each truck being connected by a link-rod, so that a series of levers should be formed, by which the brakes were operated from either end of the car by the brake-wheel, with an equal pressure upon each brake-beam."

Prior patents were set up by the defence, but there is no description of them in the report.

Drummond, J.: —

". . . In the Stevens brake, the levers are of the same order and of similar proportions, so that when operated from either end, without any serious wear or strain on other parts of the machinery, it applies all the brakes of the car with equal force to the wheels, and, consequently, they are all uniformly retarded.

"The parts of the combination — the levers, the link-rods, and rubbers — are all old, but the combination in the manner described by Stevens is new. . . . The claim of Stevens, fairly interpreted, means the particular combination and arrangement of levers, link-rods, and rubbers in a car, as he had described it, so as to produce the result; namely, the retarding, with a uniform force, of each wheel of the car, when the brake is applied."

SWIFT *v.* WHISEN, 2 Bond, 115.

S. D. of Ohio, 1867. Leavitt, J., and a Jury.

A patent originally granted to Frost & Monroe, Feb. 27, 1849, for "improvement in machinery for separating flour from bran."

The patent was thrice reissued, and the last reissue contained five claims, all of which were for combinations, — the parts of the combinations not being new. The parts, or "essential features," as they are called in the patent, were as follows: —

1. The vertical or nearly vertical position of the bolt.
2. The surrounding case, forming a chamber outside of the bolt.
3. The rotating cylinder, armed with beaters, pins, or fans.
4. The distributing head on the top of the rotating cylinder.
5. The closed-up top to the bolt proper.

6. The closed-up bottom to the bolt proper.

7. Rotating wings or bran scrapers, to clear the bottom of the bolt and discharge the bran.

Prior inventions alleged to anticipate this patent were set up by the defence, but they are not described in the report.

Leavitt, J.: —

"The court is asked to say to the jury that, as a matter of law, all the parts or devices of the combination claimed must co-act to produce a given result, in order to form a legitimate combination; and if the jury find that the surrounding case does not co-act with the vertical position of the bolt and closed-up bottom to the bolt proper for the purpose of discharging the bran, as stated in the third claim of the reissued patent upon which this suit is brought, then such claim is void for want of unity and co-operation of its several parts; and the court is requested to charge the same in respect to the combinations of the fourth and fifth claims of the patent [which were, respectively, claims for combinations of the first, second, sixth, and seventh, and first, second, fourth, fifth, sixth, seventh, of the 'essential features' above mentioned]. I suppose the entire meaning of this is, that each separate combination claimed by the patentee in the reissued patent must be what it is described to be; that all the parts must be found there, and that all those parts must co-act in producing the result claimed from the combination." [1]

Of an alleged anticipation, the court said: —

"Then, there is another machine introduced. the Bradfield smut-machine, . . . invented, it appears, in 1839, and patented in 1840. If the jury find that machine to be identical with the one covered by the plaintiff's patent, of course that would be fatal to the novelty of the Frost & Monroe invention. And here I may observe that that machine was intended and invented for an entirely different purpose than that of Frost & Monroe. But if the jury should come to the conclusion that that machine, although a smut-machine, and designed originally to separate smut from wheat, embodies the same principles with the plaintiff's machine, and that, without the exercise of invention, it could be changed so as to produce all the useful results of the Frost & Monroe machine, it would have precedence, undoubtedly, in point of novelty, over the machine invented by Frost & Monroe, provided the Bradfield machine was actually perfected and brought into use. If it

[1] We should say rather that the court was requested to state the doctrine of combination afterward laid down in the case of Reckendorfer *v.* Faber (*vide ante*, page 400).

was merely got up for the purpose of experiment, and not practically tested, it would not be regarded as a perfected invention.

"As has been well said by counsel, that which a person perfects, or invents and applies to a practical use, that is to be regarded as the invention, and the mere knowledge by an individual of a prior mechanical structure, similar to the one patented, which has not been used practically, would not be an answer to the novelty of the later patent."

TUCK *v.* BRAMHILL, 6 BLATCH. 95.

S. D. OF N. Y., 1868. BLATCHFORD, J.

J. H. Tuck's patent of June 25, 1855, for improvements in packing for pistons, valves, &c., thus described by the patentee: —

"I first take canvas, or other suitable material, and saturate it with a solution of india-rubber, or other equivalent composition. I then cut the canvas thus prepared in a diagonal manner into strips of any required width, cement the diagonal ends together, so as to form any length of fillet required, then roll it up into a roll, and allow it to cement in a firm but elastic or flexible roll of any suitable diameter required. *In cases where greater elasticity is required, I roll the canvas round a cone or centre-piece of india-rubber, or other suitable elastic material.*"

The claim was: —

"The forming of packing for pistons or stuffing-boxes of steam-engines, and for like purposes, out of saturated canvas, so cut as that the thread or warp shall run in a diagonal direction from the line or centre of the roll of packing, and rolled into form, either in connection with the india-rubber cone or other elastic material, or without, as herein set forth."

The patentee afterward disclaimed packing *without the cone.* The court held that the original claim was in effect double (being for packing both with and without the cone), and therefore divisible, so that the disclaimer was valid; and in reference to the patentability of the contrivance thus curtailed Judge Blatchford said: —

"The roll with the cone is a distinct thing from the roll without the cone. It has a utility of its own, as is quite apparent from the fact that the defendant sells it. The prior existence of the roll without the

cone is shown, but it is not shown that the roll with the cone was known or used before the invention of it by the plaintiff. If the plaintiff had known of the existence of such roll without the cone, he could have patented the combination of it with a cone, if such combination were invented by him and was new. There is sufficient utility and invention in such combination to support a patent. The result produced by the combination is a new article, and, being useful, it is patentable. Crane *v.* Price, Web. Pat. Cases, 409; McCormick *v.* Seymour, 2 Blatch. C. C. R. 243."

STIMPSON *v.* WOODMAN, 10 WALL. 117 (1869).

Woodman's patent of March 29, 1864, for boarding or "pebbling" leather (*i. e.* impressing designs upon it), by means of a cylinder of steel, engraved in bas-relief, rolling over a table upon which the leather was placed. The machinery by which the roller operated was claimed in the second claim of the patent; but in this case the first claim only was in suit. It ran as follows: —

"Boarding or pebbling skins or leather by means of a single short cylinder rolling over a table with the requisite pressure, substantially as described."

It was proved, first, that *hand*-rollers engraved like those of the plaintiff, and, secondly, that rollers operated by machinery substantially like that of the plaintiff, but unengraved, had been in use before his alleged invention.

The object of the hand-roller was the same as that of the plaintiff's roller; and the object of the smooth rollers was to give to the leather "a closer, natural grain."

On these facts it was held by a majority of the court — Clifford, J., dissenting — that the improvement was not patentable, Nelson, J., delivering the opinion: —

". . . The field of invention was open to any person to construct new devices or machinery by means of which to operate this old instrument in 'pebbling leather' [*i. e.* the hand-roller], . . . 'so as to accomplish the object desired with greater rapidity and cheapness.' And this the plaintiff would have accomplished by his machine if he had not been anticipated. . . . If the plantiff's machine had been anticipated in every part of its construction except the figures or designs on the roller, which roller was old, he was not entitled to recover. . . . There is also

another ground upon which we think this instruction should have been given. Assuming the plaintiff to have been anticipated in the construction of his machine in every part of it, except that the prior machine used a smooth revolving roller and the plaintiff a figured one, but which figured roller had been used for pebbling leather by pressure, and was well known, all of which the jury would have been warranted in finding, the engraving or stamping of the figure upon the surface of the smooth roller, or the substitution of the old figured roller for the purpose, required no invention; the change, with the existing knowledge in the art, involved simply mechanical skill, which is not patentable."

The distinction thus drawn by the court between the two grounds on which its decision rests is agreeably metaphysical. In one case the inventor is supposed to start with the figured hand-roller, and then to combine with it a previously used mechanism of motion; and the combination so made is not patentable, because it is a mere aggregation, and not a true "combination," in the sense of the patent law.

In the second case, the inventor is supposed to start with the smooth roller and its mechanism of motion, and then to change the smooth for the figured roller by actual substitution, or by engraving the smooth roller so as to make it like the hand-roller; and this result is not patentable, because the change, like the mere substitution of one material for another, involved no invention.[1]

WOODWARD *v.* DINSMORE, 4 Fish. 163.

D. of Md., 1870. Giles, J.

Woodward's patent of Feb. 24, 1857, reissued July 10, 1866, for an "improvement in solar camera."

"The invention," says the report, "consisted in an apparatus for producing enlarged copies of photographic pictures, and consisted of the adaptation to the camera-obscura of a lens for condensing the sun's rays, and focussing them at or near the achromatic lens."

The claims of the reissued patent were as follows:—

"I. Adapting to the camera-obscura a lens, or lenses, and reflector, in rear of the object-glass, in such manner that it is made to answer

[1] *Vide ante*, page 281, note.

the twofold purpose of a camera-obscura and a camera-lucida, substantially as and for the purposes specified."

"II. The arrangement and combination of the condensing lens II, or lenses D′ and H, negative slide or holder N, and achromatic lens or lenses E, made adjustable with regard to each other for condensing the sun's rays upon and through the negative, and focussing them upon prepared paper, canvas, or other suitable material for photographic purposes, substantially as described."

Some prior inventions were set up in defence, but the evidence to support them was very slight. Upon the question of patentability the court thus remarked: —

"A prominent feature of the defence, that was ably urged, was that the solar microscope was the same, in principle and mode of operation, as the solar camera; and it was insisted that here, as well as in the solar camera, the rays that passed through the condenser were focussed at the enlarging lens. Still, in my judgment, this does not make the solar microscope the equivalent of the solar camera. The microscope, like the magic lantern, produces enlarged images of objects; but neither are competent to print the image on the screen on which the images are thrown without development. In the microscope this is owing in part to the want of that combination of the actinic and visual rays which is due to the photographic lens employed in the solar camera; and in answer to the argument that a person wishing to employ a solar microscope for photographic purposes on an enlarged scale would only have to substitute a photographic lens in place of the microscopic lens, with a suitable arrangement to accommodate it and the negative, and the only lenses used for photographic purposes being achromatic lenses, it is to be said that this changing of one of the elements of a combination that will not produce a desired effect, and substituting another that makes it effective, is to produce a new and patentable combination; and even if the elements are unchanged, yet if with one arrangement they are incompetent to an end for which a different arrangement makes them competent, such new arrangement becomes patentable, unless it is such as would naturally suggest itself to persons skilled in the art to which the subject makes it akin."

WATSON *v.* CUNNINGHAM, 4 Fish. 528.

W. D. of Penn., 1871. McKennan, J.

A patent (granted to D. I. Holcomb, Dec. 14, 1869) for improvements in fruit-jars, described in the opinion of the court by McKennan, J.: —

" . . . A fruit-jar of glass or other material is made with a wide, flat surface or shoulder-bed, to receive a flat rubber ring or gasket, which encircles an upright projection forming the mouth of the jar. Upon this projection is made to fit a thin metal cover with a flanged rim, which rests on the rubber gasket. On the opposite sides of the circumference of this cap are ridges or elevations in its surface, with a slight depression in the middle of each of them, on which a wire yoke, to hold the cover down, is designed to rest and to be kept in place. This yoke is bent at its extremities, and is made to fit tightly on the shoulder of the jar, so as to cause a downward pressure on the cap. The function of the ridges is to furnish a bearing for the wire fastener, and at the same time to hold it in its place. While, therefore, the fastener rests only on these elevations, there is no central pressure on the cover by which the springing of the flange might be caused, and the air thus be allowed to pass between it and the rubber. The pressure is concentrated upon the circumference of the cover directly over the flange, and thereby a closer contact with the gasket is produced and maintained, and the air more effectually excluded. This is the distinguishing merit of the invention. . . . The nearest approximation to his [the patentee's] invention appears in those jars constructed with a shoulder, upon which an india-rubber gasket rests, with a thin metal cover pressed down on it by a wire yoke, and with elevations or lugs operating only to prevent the lateral displacement of the yoke. But they lack the distinguishing device used by the patentee, by which the bearing of the fastener is only on the periphery of the cover, and its downward pressure is thus certainly concentrated upon the whole circumference of the flange. Differing in this essential feature, . . . they are distinguishable from the patentee's invention by the omission of one of the most important constituents of the combination therein embodied.

" It is scarcely necessary to support this conclusion by a restatement of the familiar principle that a combination, all the elements of which are old, is patentable if a new or improved result is thereby obtained, or that a combination, all the elements of which except a single one have been before used together, is also the subject of a patent. The

whole combination is to be regarded as a unit; and if all its essential elements have not before been embodied and employed together, it is to be taken as an original invention."

M'MILLIN *v.* BARCLAY, 5 FISH. 189.

W. D. OF PENN., 1871. MCKENNAN, J.

One patent in suit was granted to the plaintiff April 16, 1867 (No. 63,917), for an "improvement in applying steam power to the capstans of steamboats and other crafts," which consisted, according to the claim, in

"rotating a capstan placed on deck of a boat, by means of an auxiliary engine, when said engine and capstan are placed forward of the steam-boilers of said boat, substantially as hereinbefore described, and for the purposes set forth."

It was contended that the invention was not new, and that, at best, it was an unpatentable aggregation of old devices. The court said: —

"It is satisfactorily shown by the proofs that, upon steamboats navigating the western rivers, the operation of the capstan in its usual place by the main engine is impracticable; certainly it has not been done. Before M'Millin's invention, the capstan in these boats was worked by muscular power alone. If a method, then, could be devised by which the power of steam could be applied to the capstan, without changing its location, so that it could be worked more economically, easily, and efficiently, a new and useful result would thereby be produced. This was the problem which engaged the thoughts of M'Millin, and he solved it by taking the capstan in its accustomed place, and the auxiliary or 'nigger' engine at the place usually assigned to it, both forward of the main engine, and connecting them by appropriate but well-known mechanical devices, thereby producing the desired result.

"It is to be observed that the retention of the auxiliary engine and the capstan in the positions where they were before located is an essential element of this method. The main object was to secure the unabridged performance of other valuable functions pertaining to them. Now, by the patents and other publications referred to, no information is furnished as to where the engine and capstan must be located to produce the results effected by M'Millin's invention. On the contrary, assuming that they all describe a capstan, or its fair equivalent, the capstan

must be located so that its usefulness, derived from its position on the forecastle, is lost, or the engine which actuates it, so that it cannot be used for the purposes for which the 'nigger' engine is employed. But it is urged that, as the 'nigger' engine and capstan were before used independently on steamboats, and bevel gearing was before used to connect machinery in mills, any mechanic of ordinary skill could supply the mode of connecting the 'nigger' engine and capstan employed by the patentee, and therefore no inventive skill was exerted by him. This is a narrow view of the patentee's invention. If a new or improved useful result is effected by means before well known, or any useful result is produced by a new mechanical device, or combination of old mechanical devices, in both cases the exercise of invention must necessarily be presumed, because both are the proper subjects of a patent. If the patentee, then, has devised a method of rotating the capstan of a steamboat by an organization of elements not before employed in the concrete, for that or an analogous purpose, or if his method produces an improved result, a sufficiency of invention to support his patent must be presumed. The proofs undeniably show that he did demonstrate the practicability of operating the capstan of a steamboat by power transmitted from the 'nigger engine,' without changing the place of either, so that their separate efficiency for all other purposes was preserved. They show more, -- that he was the first to do this, and that it was followed by the almost universal abandonment on Western boats of the old method of working the capstan, and the adoption of M'Millin's. With the suggestive help of all this literature of the art, and the stimulus of a result of such general interest and utility to be achieved, no one put in practice a method of effecting it until M'Millin demonstrated it to the public. These are notable facts, and surely they are persuasive, not only that the result accomplished was novel, but that it was the fruit of inventive skill."

There follows a slight description of several inventions alleged to anticipate M'Millin's combination, none of which, however, is sufficiently like it to require our notice. Also, a drawing shown to M'Millin before he completed his invention was set up; but it was proved that he had substantially devised the mechanical means employed by him before he saw the drawing.

GOULD *v.* REES, 15 WALL. p. 193 (1872).

The remarks we are about to quote were upon a question of infringement, but they are in point here.

Mr. Justice Clifford: —

"Unquestionably, the withdrawal of one ingredient in a patented combination, and the substitution of another, which was well known at the date of the patent as a proper substitute for the one withdrawn, is a mere formal alteration of the combination; and if the ingredient substituted performs substantially the same function as the one withdrawn, it would be correct to instruct the jury that such a substitution of one ingredient for another would not avoid the charge of infringement. Grant all that, and still it is clear that the concession will not support the charge of the court, as it is equally clear that if the combination constituting the invention claimed in the subsequent patent was new, or if the ingredient substituted for the one withdrawn was a newly discovered one, or even an old one performing some new function, and was not known at the date of the plaintiff's patent as a proper substitute for the ingredient withdrawn, it would avoid the infringement, as a new combination, or a newly discovered ingredient substituted for the one omitted, or even an old one performing a new function not known at the date of the plaintiff's patent as a proper substitute for the one withdrawn, would not be an equivalent for the ingredient omitted within the meaning of the patent law; nor could it be successfully claimed as such by the plaintiff in order to support the charge of infringement. Such an alteration is not a mere formal alteration, as the difference between the two improvements is such that the new combination would be the proper subject of a patent, and, consequently, would avoid the charge of infringement in a case like the one supposed by the court," &c.

SARVEN *v.* HALL, 9 BLATCH. 524.

D. OF CONN., 1872. WOODRUFF AND SHIPMAN, JJ.

Sarven's patent, reissued Sept. 6, 1860. The second claim was for

"a carriage-wheel constructed with a mortised wooden hub, with tenoned spokes and with flanges, which embrace the faces of the spokes in the immediate vicinity of the hub, and are connected together so as to form a metallic band, through which the spokes extend into the mortises in the wooden hub, substantially as before set forth."

This was construed by the court to be a claim for the combination of tenoned spokes in a wooden hub, with the metallic flanged collar. The tenoned spokes in a wooden hub are found in the ordinary wheel; "tenoned" spokes being simply spokes pared down (but not pointed), so as to be driven into the mortises, or openings of like shape and size, in the hub. The metallic collar, also, had been used, but not with tenoned spokes. The wheel in which its use was most like that in the plaintiff's had a hub not mortised, but channelled, and the spokes, instead of being tenoned, passed through a mortised metallic collar into the channel of the hub, without diminishing in size.

The defendant set up that this was not a patentable combination, but a mere aggregation. The working of the combination was thus described by the patentee: —

"After the spokes are all fitted, I put the flanged collar on the back part of the hub. The collar fitting closely to the hub serves to strengthen and support the same, while the flange fits closely to the back of the spokes. I in general make three screw-holes in the collar next the hub, into which I insert screws, so that the collar will retain its position, in case the hub should shrink. In the flange that fits against the spokes I in general make five one-fourth inch holes, in which I cut a thread to receive screws. After the back flange collar is secure, I put on the front flange collar on the front of the hub, it fitting closely to the hub, but is not screwed thereto, the flange fitting closely to the front of the spokes. In these flanges there are five holes, opposite those in the back flange. I now bore five one-fourth inch holes through the spokes, and insert screws, drawing both flanges firmly against the spokes, thereby securing all the spokes firmly in their proper place."

The object of this device was to strengthen the hub and the spokes at the hub. The court (Woodruff, J., delivering the opinion) admitted that the case was near the line, but held that the combination was patentable, because

"there is a reciprocal action or operation of the parts upon each other and conjointly upon the entire wheel, each part giving to the other increased support and efficiency, and the two co-operating to make a stronger and more durable wheel than is produced by the use of either without the other; that is to say, the tenoned spokes are strengthened and sustained in position by the flanged collars; and the flanged collars bound to the spokes by the connecting bolts or screws are more firmly

held in position by the tenons of the spokes. Combined, they unite hub and spokes, enabling the wheel better to resist a blow or strain, either laterally or in the direction of its plane. It must be conceded, within the rule on this subject, that a combination of devices would not necessarily be patentable from the mere fact that their union produced a better wheel. If the superiority arose from the fact that the two devices were intrinsically better than others, and the wheel combined both, — each, however, operating independently of the other, — the combination would be but the exercise of judgment in the choice of parts, and not invention in discovering new means to produce useful or better results. A new relation is established between the efficient means of strengthening and supporting the parts of the wheel in question, and a new and greater efficiency is given to each, which is due not to their inherent quality, but due to the combination itself."

TARR *v.* WEBB, 10 BLATCH. 96 (E. D. OF N. Y., 1872. BENEDICT, J.); TARR *v.* FOLSOM, 1 HOLMES, 313 (D. OF MASS., 1874. SHEPLEY, J.); WONSON *v.* PETERSON, 13 O. G. 549 (D. OF MASS., 1878. SHEPLEY, J.).

Tarr & Wonson's reissued patent of Oct. 17, 1871, No. 4598, for a paint to keep ships' bottoms clear of barnacles, sea-weed, &c.

In the first suit, Division A only of the patent was in question, the claim being for "a paint consisting of oxide of copper, with a suitable vehicle or medium, substantially as described." Though the claim of Division A was thus restricted, the patentees described in their specification the mode of making the paint and the ingredients which they used, — namely, Stockholm tar, benzine or naphtha, and pulverized dry oxide of copper; and the specification went on: —

"We prefer to employ the oxide of copper made from the pyritous, friable ores, because, besides being easily reduced to fine powder, these contain mineral and earthy substances, such as various other metallic oxides, sulphur, &c., which serve to divide the particles of oxide of copper, interspersing between them substances which dissolve more slowly than they do, or which do not dissolve at all, it being desirable, for the sake of economy, that the solution should be less rapid than would take place with a pure oxide of copper, and yet sufficient to give the necessary protection to the bottom. . . . All that is claimed

is that there should be a proper base, such as these earthy or mineral matters furnish, to retard the solution of oxide of copper, and give durability to the paint. Such a base, however, although desirable, in our judgment, *and as such claimed as an element in the composition of paint which we have patented in another reissue* taken at the same time with this one, is not indispensable, &c. . . . In place of the naphtha or benzine, any known diluent may be employed. The consistency of the vehicle to be about that of linseed oil."

This claim of Division A the court held invalid, as follows: —

"The . . . patent . . . seeks to secure to the patentees any mixture capable of being applied as a paint, in which oxide of copper is an ingredient. The patent is not for a process, but for a compound which the patentees claim as their own discovery. In this compound, two elements, and no others, are described as essential. There must be oxide of copper in the compound, and there must be a vehicle which will permit it to be applied to surfaces, after the manner of applying paints. It is not pretended that any new property of oxide of copper is developed, or brought into action, by this manner of using it, nor does the compound itself produce any effect not before known. All the benefit derived from the use of the compound arises from the poisonous effect of oxide of copper, — an effect long well known. So understood, the patent is invalid. It discloses no discovery to be rewarded. Oxide of copper and its poisonous effects have long been known. Compounds capable of being applied to surfaces, in order to protect the same, are in universal use; and there was nothing new in the idea that oxide of copper could in this way be applied to surfaces."

In the second case, before Shepley, J., Division B of the reissue referred to in the italicized part of the above-quoted specification was in suit. The claim of Division B was for a paint "compounded" (in the language of the court),

"*first*, of a suitable vehicle or medium; *second*, of the oxide of copper yielding a poisonous solution in water; *third*, together with such earthy and mineral matters as separate the particles of the oxide and retard such solution. . . .

"It is not necessary," the court then said, "to decide whether the views expressed in an opinion given by [Benedict, J.], denying the motion for a preliminary injunction based upon an alleged infringement of Division A, which opinion was based upon the evidence before him on *ex parte* affidavits, would justify similar conclusions upon such a

state of the evidence as is exhibited upon the final hearing in this case. It is apparent that the testimony in this record, aided by the elaborate investigation and learned arguments of the counsel on both sides, has presented this question, so far as it relates to Division A, in many new and different lights from those brought to bear upon it in the presentation of the question before that learned judge. But the infringement, if there were any in this case, was of the composition of matter described in Division B. I shall confine my decision to that branch of the patent."

Shepley, J., then states the claim in language which we have quoted, declaring the invention to be patentable; and he goes on to notice the chief ground of the defence, — a paint invented by one Wetterstedt, which was expressly disclaimed by the plaintiffs in their specification.

"Wetterstedt describes the basis of his invention 'to consist in the combination of regulus of antimony in various proportions with copper, tin, zinc, or lead.'"

But the Wetterstedt paint, when used on iron bottoms, required to be supplemented by an auxiliary paint composed of two pounds of the alloy of antimony and copper, four pounds of oxide of copper, mixed with five pints of the compound of tar and naphtha, and with three pints of pure naphtha.

The omission of the alloy of antimony and copper in the plaintiffs' paint was obviously, the court declared, enough to make it patentable, those ingredients being thought essential before their invention. Moreover, the plaintiffs' paint was simpler, cheaper, and no less effective than Wetterstedt's. Patent sustained.

THE RUSSELL & ERWIN MANUFACTURING CO. *v.* MALLORY, 10 Blatch. 140.

D. of Conn., 1872. Woodruff and Shipman, JJ.

The claim of the patent was as follows: —

"The combination of a lock and latch, when the latch-bolt and its operative mechanism are arranged in a case or frame independent of the main case, and constructed so that the latch-bolt may be reversed, substantially as described, without removing the said independent case from the main case."

The invention in this case was of a latch so constructed that, without taking it out of its case, it could be turned over, and thus made adjustable for a right-hand or a left-hand door; whereas, formerly, latches being bevelled on one side and not on the other, and being incapable of such reversal, were fitted only for right-hand or for left-hand doors, as the case might be, and not for both indiscriminately.

The defence set up that the claim, being for a combination of a latch and a lock which acted independently of each other, and without affecting each other, was not for a true combination, but for a mere aggregation, and was therefore invalid. But the court held that, the latch being new, it was open to the patentee to claim it, as he had done, in combination with a lock, although he might have made his claim simply to the latch, and therefore to its use in any possible combination. He had unnecessarily restricted his claim, but it was none the less valid.

THE LOCOMOTIVE-ENGINE SAFETY-TRUCK CO. *v.* THE ERIE RAILWAY CO., 10 BLATCH. 292.[1]

S. D. OF N. Y., 1872. BLATCHFORD, J.

Patent of Alba F. Smith, dated Feb. 11, 1862, for an "improvement in trucks for locomotives."

The specification said:—

"Several laterally moving trucks have been made and applied to railroad cars. My invention does not relate broadly to such laterally moving trucks, but my said invention consists in the employment, in a locomotive engine, of a truck or pilot wheels provided with pendent links, to allow of a lateral movement, so that the driving-wheels of the locomotive engine continue to move correctly on a curved track, in consequence of the lateral movement allowed by said pendent links, the forward part of the engine travelling at a tangent to the curve, while the axles of the drivers are parallel, or nearly so, to the radial line of curve. In the drawing, I have represented my improved truck itself. The mode of applying the same to any ordinary locomotive engine will be apparent to any competent mechanic, as my truck can be fitted in the place of those already constructed, or the same may be altered to include my improvement."

[1] This case belongs more properly, perhaps, in the chapter on New Use.

The claim was:—

"The employment in a locomotive engine of a truck or pilot wheels, fitted with the pendent links O, O, to allow of lateral motion to the engine, as specified, whereby the drivers of said engine are allowed to remain correctly on the track, in consequence of the lateral motion of the truck, allowed for by said pendent links when running on a curve, as set forth."

Blatchford, J., thus described the improvement:—

"The truck has four wheels, on two axles, and a frame made in the usual manner of the frame of an ordinary locomotive truck. It has a centre cross-bearing plate or platform, made of two thicknesses of iron plate, riveted together and embracing the upper bars of the frame, and a bolster, made of a flanged bar, through a hole in the centre of which the king-bolt passes. The king-bolt also goes through an elongated opening in the bearing-plate, to allow a lateral motion to the truck beneath the bolster. At the same time, the king-bolt is a connection to hold the truck to the engine. The bolster takes the weight of the engine in the middle, and is itself suspended at the ends of bars attached to the moving ends of pendent links, which are attached by bolts at their upper ends to brackets on the frame. The distance between the bars transversely of the truck is slightly more than that between the bolts, so that the pendent links diverge slightly. The specification says: 'When running upon a straight road, the engine preserves great steadiness, because any change of position, transversely of the truck, in consequence of the engine moving over the truck, or the truck beneath the engine, is checked by the weight of the engine hanging upon the links, and, in consequence of their divergence, any side movement causes the links on the side towards which the movement occurs to assume a more inclined position, while the other links come vertical, or nearly so. Hence the weight of the engine acts with a leverage upon the most inclined links to bring them into the same angle as the others, greatly promoting the steadiness of the engine in running in a straight line. As the pilot or truck wheels enter a curve, a sidewise movement is given to the truck, in consequence of the engine and drivers continuing to travel at a tangent to the curve of the track. This movement, and the slight turn of the whole truck on the king-bolt, not only causes the truck wheels to travel correctly on the track, with their axles parallel to the radial line of the curve of track, but also elevates the outer side of the engine, preventing any tendency to run off the track upon the outer side of the curve. Upon entering a straight track, the truck again assumes the central position, and, in case of

irregularity in the track, or any obstruction, the truck moves laterally, without disturbing the movement of the engine. I do not claim laterally moving trucks, nor pendent links separately considered.'"

With this explanation, the reader will be prepared to consider the chief point of the defence, which was that the contrivance described by the plaintiff having been patented before in connection with ordinary eight-wheel cars, it was not open to the plaintiff to patent it in combination with a locomotive engine.

Blatchford, J., said: —

"This [the plaintiff's] precise construction of divergent links is shown in the patent gra :ted to Kipple & Bullock, Dec. 20, 1859, for an 'improvement in car trucks.' Their use has the tendency to elevate the outer side of the car on a curve, and the tendency to steady the body of the car through its weight on the links that are most inclined, and the tendency to limit the lateral movement, without using side springs. But although the mode of operation of a Kipple & Bullock truck *per se*, in a car having a like truck at its other end, is the same, for all the purposes of the truck itself, that it is in a structure which has driving-wheels at the other end, yet the moment the truck swivelling on a king-bolt is taken out of the other end of the structure, and driving-wheels take its place, the mode of operation of the structure as a whole becomes different from the mode of operation of the structure with the two swivelling trucks. This is conceded by the expert for the defendants, and is quite manifest. The mode of operation becomes such as is described in Smith's specification, and no such mode of operation exists in the structure with the two trucks. Moreover, the existence of the Kipple & Bullock patent, and the use of cars each with two of their trucks, does not seem to have suggested, before the invention of Smith, the use of one of such trucks as a pilot truck in a locomotive engine, to obviate the well-known difficulties in using the engine on a curve."

The defence also set up as anticipating the plaintiff's patent that of one Bissell, granted Aug. 4, 1857, for a locomotive truck. Bissell's truck had no swivelling motion around its centre-pin or king-bolt, which served simply as a draft-block or pin. This truck, therefore, being both in operation and in result unlike the plaintiff's, was held not to anticipate it.

A similar decision on this patent was made by Strong, J., in the later case of the same plaintiff *v.* The Pennsylvania R. R. Co., 6 O. G. 927 (E. D of Penn., 1874).

HAILES *v.* VAN WORMER, 20 WALL. 353 (1873).

There were two patents in suit, one reissued to Hailes & Treadwell, Feb. 3, 1863; the other granted to Mead & Hailes, Aug. 11, 1863. Both were for combinations, in a base-burning stove, of certain devices, all of which had been used separately before the patentees' alleged inventions.

The devices which the defendants were alleged to infringe (there were some others in the combination) were as follows:—

"1.[1] A flaring fire-pot, supported by a base, the diameter of the pot being larger at the top than at the bottom.

"2. A magazine or reservoir for supplying coal, located over the fire-pot, and having its lower end contracted.

"3. Revertible passages or flues outside of the pot, for the conduct of the products of combustion downwards to the base of the stove and thence to a main draft-flue leading thereout.

"4. A direct draft for such stoves as are constructed with revertible flues, the direct draft being obtained by a flue passing out above the fire-pot, and provided with a damper to be closed after the fuel has been ignited.

"5. Openings in the case or exterior of the stove, and the insertion of mica therein, for the purpose of illuminating the room in which the stove may be with the light of the burning fuel."

"The objects," said Mr. Justice Strong, "are, . . . first, to prevent the passage of the products of combustion up, around and over the top of the coal-supply reservoir, so as to heat a surrounding jacket thereof; and, secondly, to heat a circulating or ascending body of air by means of radiated heat from the fire-pot, and at the same time to heat the base of the stove by means of direct heat circulating through descending flues which lead into the ash-pit, or around it, and to the smoke and draft flue. A third avowed object is to secure economy by retarding the fall of the coal into the fire-pot from the supply reservoir, and by causing the flame to circulate outside of the contracted discharge of the reservoir, and around the upper edge of the fire-pot, and thence to descend around or under the base of the stove in its passage to the smoke and draft flue. Such are the avowed objects of the combinations claimed to have been devised by the patentees, and their effects they assert to be husbanding the radiated heat, and using it for the purpose of warming the upper part of the stove and the room in which it is

[1] The court, by Strong, J.

situated, as well as for heating air for warming rooms above, if desirable, and at the same time so confining the direct fire-heat, and keeping it in contact with the base portion of the stove, as to insure warming it to a comfortable degree. A second effect claimed is relief of the incandescent coal from the weight of the body of superincumbent coal [by contracting the lower end of the coal reservoir], thus preventing the compression of the burning coal in the fire-pot, and securing for the flame free expansion, thus enabling it to act with greater heating effect upon the lower portion of the stove in its passage to the smoke and draft flue."

Of the first three of these devices the court said: —

"They have no relation to each other. Neither the form of the feeder nor the shape of the fire-pot bears at all upon the direction of the draft-passages. There is no novel result flowing from the joint operation of the three devices. The revertible flues have no more to do with a stove supplied by a feeder than they would have with a stove supplied by hand."

And so of the remaining devices; and upon the whole case the court remarked: —

"Combined results are not necessarily a novel result, nor are they an old result obtained in a new and improved manner. Merely bringing old devices into juxtaposition, and there allowing each to work out its own effect without the production of something novel, is not invention," [1] &c.

BLAKE *v.* RAWSON, 1 HOLMES, 200.[2]

D. OF MASS., 1873. SHEPLEY, J.

The patent (granted to E. W. Blake, Jan. 9, 1866) was for a stone-breaking machine, all the elements of which were old. The only question important for our purpose raised in the trial was whether the Blake machine was anticipated by the Hamilton machine, — a stone-breaker composed of the same elements as

[1] *Vide ante*, page 396.

[2] This patent was also sustained by Shipman, J. (S. D. of N. Y.), whose decision was affirmed by Judge Nelson in the case of Blake *v.* Stafford, 6 Blatch. 195; and also by Judge Drummond, Blake *v.* Eagle Works Mfg. Co., 3 Biss. 77.

Blake's, but working on a different principle. Blake's machine was thus described by him (*vide* 6 Blatch. 195):—

"My stone-breaker, so far as respects its principle or its essential characteristics, consists of a pair of jaws, one fixed and the other movable, between which the stones are to be broken, having their acting faces nearly in an upright position, and convergent downward, one toward the other, in such manner that while the space at the top is such as to receive the stones that are to be broken, that at the bottom is only sufficient to allow the fragments to pass when broken to the required size, and giving to the movable jaw a short and powerful vibration through a small space, say one-fourth of an inch, more or less. By means of this form and arrangement of the jaws, and this motion of the movable jaw, when a stone is dropped into the space between them, it falls down until its farther descent is arrested between their convergent faces. The movable jaw advancing, crushes it; then receding, liberates the fragments, and they again descend, and if too large, are again crushed; and so on until all the fragments, having been sufficiently reduced, have passed out through the narrow space at the bottom," &c.

In a subsequent reissue there was added the claim

"of a revolving shaft, driven by steam or other power, which is made to impart to one of these jaws a continual vibratory movement," &c.

The Hamilton machine was thus described by Shepley, J.:—

". . . A combination of certain elements which, separately considered, do not materially differ from the elements of the combination described in the Blake patent. All the elements of the combination are old in both machines. The novelty in both consisted in the peculiar mechanical combination of the members of the contrivance and the resultant mode of operation. The movable jaw in the Blake machine advances toward and recedes from the fixed jaw in a direction substantially at right angles with the faces of the jaws; so that when advancing, the stones are nipped and crushed between the jaws, and when receding, the stones are liberated. In the Hamilton quartz-crusher there is a cylindrical roller or pestle, in a basin having its sides eccentric to the circle of the movement of the roller or cylindrical pestle, the inner sides at the bottom of the curved basin gradually approximating to the circle of movement of the cylindrical roller. This cylinder is made to move around its central shaft with a reciprocating, vibratory movement, but being cylindrical, and turning upon a fixed central axis, can only move in the direction of the periphery of the cylinder.

The surfaces of the cylinder operate upon the material by a grinding process, tending to rotate the stones on their own axis, and at the same time to draw them down into a space where, by reason of the eccentricity of the opposite surfaces, they are nearer to each other than at the point where they begin to operate on the stones to be crushed.[1] In the Hamilton machine every point on the acting face of the roller moves in the segment of the circle of the periphery. In the Blake machine it is strictly correct to say that the points in the movable jaw advance toward the fixed jaw in the arc of a circle; but the *whole* movable jaw advances toward and recedes from the fixed jaw, and the space through which it moves is so small compared with the periphery of the circle, which would be described if its rotation were continued, that the operation upon the material is substantially the same as if the movable jaw were advanced toward the fixed jaw in a direction at right angles with the face of the jaw, nipping and crushing the material at the points of impact, without any tendency to a rotating or grinding action upon it. In the Hamilton crusher the surface of the rotating cylinder passes laterally by the surface of the basin, reducing the material both by the grinding operation and by moving it into a space progressively narrower, as if it was passing between rollers. The mode of operation is different in the two machines.

"It is not always enough to prove that two combinations of elements are equivalent, to show that each element of the combination in one may be regarded under some circumstances as the equivalent of the corresponding element in the other, when the elements are separately considered. If the mechanical combination of the members of the two machines be such that the action and mode of operation differ in the two machines, then one is something more than a mere mechanical equivalent for the other."

[1] In his specification he said: "My invention consists in the use of a cylindrical nut or pestle in a similarly formed basin, the pestle having a partial rotary and crushing motion communicated to it by means of a lever attached thereto." The claim was for "the means herein described and shown for crushing and grinding metallic ores, consisting of the cylindrical pestle '*d*,' provided with grooves in its upper part to crack the lumps of ore, and set on a shaft 'C,' on which it has a partial rotary motion, and operating in connection with the basin 'A,' in which said pestle moves to grind the ore into powder by the gradual approach of the sides of said basin to the cylindrical pestle, said pestle being also provided with a scraper or agitator, '5,' in its lower surface, to operate as specified." See 94 U. S. p. 731; Blake *v.* Robertson, *infra*.

Subsequently this patent came before the Supreme Court, on appeal from the Eastern District of New York, in the case of

BLAKE *v.* ROBERTSON, 94 U. S. 728 (1876),

where, besides the Hamilton machine, the defence set up a patent to Hobbs & Brown, of September, 1849, whose machine is thus described by the court (Mr. Justice Swayne): —

"'The machine of Hobbs & Brown is for 'improvements in the application of well-known mechanical means for the purpose of crushing ice.' . . . The 'improvements consist in applying a hopper with one diagonal fixed side and two parallel sides, to contain the ice, and compressing the ice by a movable fourth side, the fixed diagonal side and moving side having within them dental projections cut or cast on, to operate downward and prevent the ice from rising in the hopper when compressed, and also to enter and split the ice.'

"'The machine is operated 'by the combination with these parts of a lever fitted with an eccentric or cam-formed point.' There is in this description neither of the ingredients nor the compound of the Blake machine. Every element and the combination are wanting. There is no mention of the converging adjustable jaws, of the revolving shaft, nor of the fly-wheel. The differences are as marked in the mode of operation as in the structural elements of the machine.

"The Hobbs & Brown machine does its work by the downward and sweeping movement of the jaw and the grasping and splitting by the teeth. The motive-power is supplied and applied by a hand-lever, which gives a motion irregular, and varying with the varying exigencies of the ice during the process to which it is subjected. The Blake machine performs its functions by the short, regular, and unvarying vibrations of the smooth-faced adjustable jaw, driven without intermission by the revolving shaft. It is obvious that the Hobbs & Brown machine could not be applied with effect to the purpose of breaking stones, without essential changes of principle and details."

Of the Hamilton machine the court said: —

"We have here no reflex or embodiment of either of the ideas that found expression in the Blake machine. The converging jaws, the revolving shaft, and the fly-wheel are all wanting, as in the Hobbs & Brown machine. Instead, there is a cylindrical nut or pestle, having a partial rotary and crushing motion communicated to it by means of a lever attached thereto. The pestle rotates on a central axis within an eccentric concave. The work is done by this pestle. There is nothing of the vibratory motion of a movable jaw alternately advancing and

receding, as in the Blake invention. The difference is not that of mere mechanical equivalents. It is radical, and goes to the essence of the organisms. These considerations are so obvious, that further remarks upon the subject are unnecessary. The proofs show that but two of the Hamilton machines were ever made. Practically the invention was abandoned."

FORSYTH *v.* CLAPP, 1 HOLMES, 278.

D. OF MASS., 1873. SHEPLEY, J.

The invention related to rubber rolls for the shafts of wringing-machines.

The patentee combined a peculiar kind of roll, formed of fibrous cloth and rubber, with the shaft. Both the material and the shaft were old, and so was the manner of connecting the two.

The material, or one substantially like it, had been sold in tubes to consumers, who cut them in sections or rings for stuffing-boxes. But inasmuch as a new result was obtained by the combination, it was held patentable. The new result was that it prevented separation of roll and shaft by the tearing away of the greater part of the roll from such small portions of it as adhered to the shaft. This was a common vice of wringers.

ROSS *v.* WOLFINGER, 5 O. G. 117.

N. D. OF ILL., 1873. BLODGETT, J.

Ross & Marshall's reissued patent of Feb. 26, 1861, afterward extended, for the combination (1) of a cabinet with a sewing-machine, and (2) of a box with the cabinet and sewing-machine.

The patentee simply put the sewing part of the machine on top of an ordinary cabinet, and the foot-pedal inside of it. He supplied a box to cover the top of the machine when it was not in use, and he claimed a patent for the two combinations. His device was not even new. Said the court:—

"The evidence shows that, prior to these patents being granted, the Singer Manufacturing Company, who were then just commencing

the introduction of their sewing-machine into the market, were in the habit of sending out their machines packed in a box, large enough to hold the treadle and the pitman, with a hole cut in the top, or directions for cutting the hole in the top, so that the pitman could be made to connect, and fitting the machine on top of the box, so that the box in which the machine was shipped became the cabinet upon which it was operated, or could be used as such; and I can see no difference between the contrivance thus made and introduced by Singer and this patentee's cabinet, except that this patentee has a door hung on hinges, which can be opened or closed at will [and these were found in the ordinary cabinet], and which only exclude the dust from the treadle and pitman, because the machine itself sits on top of the cabinet, and other appliances must be used to keep the dust from the machine.

"I should have very great doubt whether there is utility enough, practically, in the mere enclosing of the pitman and treadle of a sewing-machine in a box to justify the issuing of a patent for that purpose on the score of usefulness, although the measure of usefulness is not alone the criterion by which the Patent Office is governed in issuing a patent on the ground that it is both novel and *useful*. If it has any use at all, I think the Patent Office assumes that the degree or extent or measure of usefulness is not to be inquired into by them; but certainly there is no proof in this case to show that it is any benefit whatever to the pitman and treadle of a sewing-machine to keep them enclosed from the dust. There are very few wearing parts in it, — no delicate parts, nothing which would apparently require to be kept from the dust. But be that as it may, the complainant's device was simply taking an ordinary cabinet or wash-stand, and putting his pitman and treadle inside of it and the machine on top of it, and making another box to set over the machine to keep the dust from it; . . . and so far as the top box is concerned, . . . any other covering, such as a cloth or curtain hung or turned over the machine, would naturally suggest itself for the purpose of protecting the machine from dust; and I cannot conceive myself that there is any invention in this device of using a box instead of a cloth or curtain.

"It is a mere aggregation of useful parts, neither of those parts performing, in my estimation, any additional or new functions by being brought together. There is no such act of the mind as rises to the dignity of an invention about this device."

INGELS *v.* MAST, 6 Fish. 415.

S. D. of Ohio, 1873. Swayne, Emmons, Swing, JJ.

Patent No. 90,268, dated May 18, 1869, reissued as No. 3976, May 17, 1870, for a seed-drill.

The plaintiff claimed the new combination of the following old devices: (1) A concave seed-cup, wherein the seed-wheel turned, with (2) cheeks which served as end-bearings for the wheels, and also to hold the grain by enlarging the feed-wheel; (3) an elevated delivery;[1] and (4) a seed-wheel with cogs extended beyond the cheeks.

The court held that this combination was not anticipated by the seed-drill of Jessup, which had the concave seed-cup, with the seed-wheel turning therein, the cheeks and the elevated cogs, projecting beyond the cheeks, but which had not the elevated discharge; nor by the device of Moore, which differed in like manner from the plaintiff's; nor by the Strayer drill, which had the elevated discharge orifice, but not the other elements of the plaintiff's machine.

BIRDSELL *v.* McDONALD, 6 O. G. 682.

N. D. of Ohio, 1874. Swayne and Walker, JJ.

Patent for a machine for getting out clover-seed.

The invention is not particularly described in the report. The parts of the machine were old; their combination was new. On this point Swayne, J., said: —

" . . . It is further objected that the reissue is for a mere aggregation of old things, — that the aggregation involved nothing of invention, and was without merit, and therefore not patentable.

"The slightest examination of the specifications, the models, and the evidence, will at once dispose of this illusion.

[1] "The testimony of experts . . . establishes," says the opinion, delivered by Swing, J., "two classes of feed-cups, to wit, gravitating feed and forced feed. In the first, the seed is allowed to drop through the simple force of gravitation; in the second, there must be a wheel so constructed as to carry the grain around and up to the elevated orifice. This testimony shows further, that, if that orifice is on a level, in going over rough ground the grain may be easily thrown out in too large quantities; while if it is elevated this cannot occur."

"The machine, though made up of several elements, is a unit. Its purpose is to get out clover-seed and prepare it for use. All its parts co-operate for that result, and are necessary to that end. Without either, there would be a failure to the extent of the function which it performs, and the work intended to be accomplished would be imperfectly done. It is not necessary that every function should be performed simultaneously. Their connection and operation, as in this case, in immediate succession is sufficient," &c.

THE NATIONAL CAR-SPRING CO. *v.* THE UNION CAR-SPRING MANUFACTURING CO., 12 BLATCH. 80.

S. D. OF N. Y., 1874. BLATCHFORD, J.

Patent reissued, Dec. 13, 1870, to complainants (as assignees of Bussell, the inventor), for an "improvement in combined india-rubber and steel springs."

The specification: —

"This invention consists in surrounding a column of india-rubber, or its equivalent, by a spiral metallic spring, so arranged that each sustains the other, whereby a more perfect and serviceable spring for the purposes specified is produced than by any combination of rubber and metal hitherto known, . . . the two springs being of equal length, so as to have the same bearings at the ends, and the relative diameters of the two being such that the steel or metal spring will fit snugly on the rubber column. The columns of rubber may be fluted, as shown in the drawing, by several concavities running longitudinally."

Said the court: —

"This construction is regarded as a desirable one, as it allows the rubber, when pressure is applied to the spring, to expand laterally into the said concavities, thus preventing it to a degree from being pressed outward between the coils of the metal spring, where it is liable to be chafed and worn. . . . The combination of spiral metallic springs with rubber, or its equivalent, for the purpose here described, is not new. Ray, in the year 1848, obtained a patent for such a combination; but he described . . . a spiral metallic spring placed within a hollow rubber column or tube, and then supported the rubber externally by detached metal rings. . . .

"The arrangement and combination of Bussell is distinct from, and is thought superior to, Ray's, both for the reason that it permits

the use of a solid column of rubber, or its equivalent, which Ray's does not, and because the spring, when placed exterior to the rubber, or its equivalent, performs alone the combined offices of both the spiral spring and the detached rings in Ray's, thus rendering Bussell's arrangement much the more simple and cheaper of the two. Another objection to arranging the spiral within the rubber tube is that either the rubber tube has to be made objectionably large in diameter, or the spiral objectionably small. This difficulty is obviated in Bussell's combination, as is evident." Patent sustained.

BALL *v.* WITHINGTON, 6 O. G. 933.

S. D. OF OHIO, 1874. EMMONS AND SWING, JJ.

A *dictum* in the opinion is thus stated by the head-note: —

"The direct radiation of heat into baking-chambers [for bread], and the use of bread-holders swinging from the arms of rotating wheels, being both well known, it seems that a patent for the combination of the two cannot be sustained."

RECKENDORFER *v.* FABER, 92 U. S. 347 (1875).

Two patents, each for a combination of lead-pencil and rubber-eraser, — namely, H. L. Lipman's patent, granted March 30, 1858, extended March 30, 1872; and J. Reckendorfer's, dated Nov. 4, 1862, reissued March 1, 1872.

According to the first patent, one end of the pencil, being a quarter of its whole length, enclosed a cube of rubber, just as the lead is enclosed in an ordinary pencil. The improvement described in the second patent consisted in making the rubber end of the pencil larger than the rest of it, and tapering, so that the pencil held a bigger piece of rubber, in a bigger handle, without being large and clumsy in the lead part of it, where it is held in writing.

It was decided by the court, Strong, Davis, and Bradley, JJ., dissenting, that these improvements were cases of aggregation without combination, and therefore not patentable.

Mr. Justice Hunt delivered the opinion : —

" . . . Does the article patented by Lipman and improved by Reckendorfer involve an invention? or is it a product of mechanical skill or a construction of convenience only?

" . . . This combination consists only of the application of a piece of rubber to one end of the same piece of wood which makes a lead-pencil. It is as if a patent should be granted for an article, . . . consisting of a stick twelve inches long, on one end of which is an ordinary hammer, and on the other end is a screw-driver or a tack-drawer, or, what you will see in use in every retail shop, a lead-pencil, on one end of which is a steel pen. It is the case of a garden-rake, on the handle-end of which should be placed a hoe, or on the other side of the same end of which should be placed a hoe. In all these cases there might be the advantage of carrying about one instrument instead of two, or of avoiding the liability to loss or misplacing of separate tools. The instruments placed upon the same rod might be more convenient for use than when used separately. Each, however, continues to perform its own duty, and nothing else. No effect is produced, no result follows, from the joint use of the two. A handle in common, a joint handle, does not create a new or combined operation. The handle for the pencil does not create or aid the handle for the eraser. The handle for the eraser does not create or aid the handle for the pencil. Each had, and each requires, a handle the same as it had and required, without reference to what is at the other end of the instrument; and the operation of the handle of and for each is precisely the same, whether the new article is or is not at the other end of it. In this and the cases supposed you have but a rake, a hoe, a hammer, a pencil, or an eraser, when you are done. The law requires more than a change of form, or juxtaposition of parts, or of the external arrangements of things, or of the order in which they are used, to give patentability. Curtis on Pat. § 50; Hailes *v.* Van Wormer, 20 Wall. 353. A double use is not patentable, nor does its cheapness make it so. Curtis, §§ 56, 73. An instrument or manufacture which is the result of mechanical skill merely is not patentable. Mechanical skill is one thing; invention is a different thing. Perfection of workmanship, however much it may increase the convenience, extend the use, or diminish expense, is not patentable. The distinction between mechanical skill, with its conveniences and advantages and inventive genius, is recognized in all the cases.

" 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. A stem-winding watch-key is another instance. The office of the stem is to hold the watch, or hang the chain to the watch; the office of the key is to wind it. When the stem is made the key, the joint duty of holding the chain and winding the watch is performed by the same instrument. A 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 the case we are considering, the parts claimed to make a combination are distinct and disconnected. Not only is there no new result, but no joint operation. When the lead is used, it performs the same operation and in the same manner as it would do if there were no rubber at the other end of the pencil; when the rubber is used, it is in the same manner and performs the same duty as if the lead were not in the same pencil. A pencil is laid down and the rubber is taken up, the one to write, the other to erase: a pencil is turned over to erase with, or an eraser is turned over to write with. The principle is the same in both instances. It may be more convenient to have the two instruments on one rod than on two. There may be a security against the absence of the tools of an artist or mechanic from the fact that the greater the number the greater the danger of loss. It may be more convenient to turn over the different ends of the same stick, than to lay down one stick and take up another. This, however, is not invention within the patent law, as the authorities cited fully show. There is no relation between the instruments in the performance of their several functions, and no reciprocal action, no parts used in common." [1]

[1] See the Rubber-Tip Pencil Co. *v.* Howard, *ante*, page 247.

THE STILLWELL & BIERCE MANUFACTURING CO. *v.* THE CINCINNATI GASLIGHT & COKE CO., 7 O. G. 829.

S. D. OF OHIO, 1875. SWING, J.

Stillwell's reissued patent, No. 3618, dated Aug. 24, 1869, for "improvements in feed-water heaters and filters."

The object of the invention was to purify water before it passed into a boiler to be heated. This was accomplished by making it flow over a series of heated metal shelves, whereby matter held in solution was deposited, and then through filtering material (placed between the shelves and the outlet into the boiler), whereby matter held in suspension was deposited.

Both of these devices, the shelves and the filtering material, had been used before for the same purpose. All that the plaintiff did was to put them together; and so putting them together did not add to or change the efficiency which either had when used separately. This would seem to be a clear case of aggregation; but the court held otherwise, as follows (after stating that no new office was performed by either device when thus combined; that, separately, the shelves cleared the water of matter held in solution and partly of that held in suspension, and the filter cleared it only of matter held in suspension): —

"But by combining both in a single machine both of these objects are accomplished, and the water is passed into the boiler, in a condition different from that in which it was in passing from either of the devices after their separate action upon it. If this be so, a new result is produced by the union — a result not previously produced by either of the elements acting separately — which removes it from the doctrine of aggregation, as laid down in the cases of Hailes *v.* Van Wormer, 5 O. G. 91;[1] Birdsell *v.* McDonald, 6 O. G. 612."[2]

It seems to us that this line of reasoning would make almost any aggregation patentable.

The novelty of the improvement was also attacked. The evidence on this head is summed up at length in the opinion, but merely to ascertain whether a certain fact was proved, and not for the purpose of estimating the weight of that fact.

This case is also another authority to the point that the making

[1] *Vide* p. 443.

[2] *Vide* p. 450.

of a model does not of itself constitute invention. "It can only be used," said the court, "as an item of testimony."

BUSSEY *v.* WAGER, 9 O. G. 300.

N. D. OF N. Y., 1876. WALLACE, J.

Improvement in stoves.

The report contains no description of the invention other than that in the opinion of the court, as follows:—

"I. In view of the state of the art prior to Bussey's patent, none of the parts claimed in the patent are new, but Bussey effected a new combination which produced new and useful results, and not merely an aggregation of the results due to the independent action of the several parts. He combined a reservoir in such relation to a top-plate and partial back-plate, that the reservoir performed both the functions of a reservoir and of a partial back-plate of a stove; and this is the new result, and the only one, due to the combination. By the combination the top-plate supported a reservoir in place of the portion of the back-plate omitted, but in this it performed no other function. In a large number of stoves, and from the earliest constructions, one of the functions of a top-plate has been to support water-reservoirs exposed to the heat-passage of the stove. In the Stewart stove, it supported a reservoir in the rear of the body of the stove. Neither did the exit-passage by the combination perform any new function. Numerous instances of its use to heat reservoirs have been adduced. In the Stevens construction its relation to the reservoir was precisely the same as in Bussey's.

"II. The combination involved invention, and produced a beneficial result; that it involves invention follows from what has been above stated. That it produced beneficial results is evidenced by the practical success of the improvement. While, obviously, by changing the form and proportions of a reservoir cooking-stove, thereby making a more attractive article, Bussey made an improvement, in a general sense, these changes were not patentable. But the removal or omission of a portion of the back-plate, and supplying its place with a reservoir, though it now seems to have been a very simple invention, substantially effected a new organization of the stove, which at once commanded the favor of dealers and manufacturers, has since been very generally adopted, and was, I think, the fundamental idea of the defendants' constructions."

RUBBER-COATED HARNESS-TRIMMING CO. *v.* WELLING, 97 U. S. 7 (1877).

W. M. Welling's patent, No. 37,941, dated March 17, 1863. The claim was: —

"The ring for martingales, &c., manufactured as set forth, with a metal ring enveloped in composition, as and for the purposes specified."

The process for producing this patented article was thus described in the specification: —

"In order to make my improved rings, I take a ring of metal, . . . such as shown at *a*, or said ring may be formed by punching out a washer from a sheet of metal, or in any other suitable way. I take the amount of artificial ivory composition, and by dies or by hand cause the said composition to completely envelop the said ring with as much uniformity as possible, as at *b*; and, to give the exterior finish to the same, press and solidify the mass of composition around the ring by means of dies, and in so doing any plain or more or less ornamental shape may be given to the said ring or the surface thereof. My ring is thus made of the desired ornamental appearance, while great strength is attained at very little cost."

The artificial ivory with which the patentee proposed to cover his rings was not a new substance, having been the subject of a former patent to him.

Mr. Justice Hunt (for the court), after reviewing the evidence as to the state of the art, summed it up as follows: —

"Not only were there well known and in extensive use, before Welling's patent, iron rings, tubes, pipes, toys, and other articles of manufacture enveloped in and surrounded by glass, enamel, rubber, and other like substances, but these coverings had been applied and ornamented by means of moulds or dies."

He next concluded that the patent, as is evident, was for a product, and not for a process.

"A metal ring enveloped in composition would seem to be the plain subject of the monopoly, the other language being merely illustrative of or supplemental to the main idea."

Then, referring to the construction given by the patentee to the patent, namely, that it embraced metallic harness-rings covered with composition of *any kind*, he said: —

"If this is the true construction of the patent, it cannot be sustained under the evidence showing the use of covering of harness-rings by various compositions, and patents [1] providing for such use, prior to his patent."

And he concluded as follows: —

"Another construction claims that the patent covers a ring having an iron core covered with a plastic composition, if and provided the article is finished by dies. . . . Nearly allied to this idea, if not identical with it, is that of the judge who tried this case at the circuit. He says of Welling's patent: 'His instrumentalities were all old, — an iron ring, a plastic composition, and a die; but, so far as appears in the case, they were new in combination; . . . and the combination is a metal ring, surrounded with some plastic composition, like artificial ivory, of such a nature that it is capable of being compressed, solidified, and polished by the action of the dies, and which is in fact subjected to such action, whereby a martingale ring is produced with an exterior surface more durable and more highly polished than had before been obtained by different processes of manufacture, and at greater cost.'

"We think the evidence shows that this combination, — if it is entitled to that rank in mechanics, — as well as the ring and the compound, is old. There is, in truth, no combined action. The iron core is used as a basis, the covering is of a pliable composition, and it is pressed or stamped by dies or moulds. All this is done separately, by no combined action. This is just as much, and nothing more, than is described by the witnesses, and by the patents prior to Welling's. It is simply the application and the action of old and well-known modes and materials in an accustomed manner. It is a case of aggregation, not of combination. Can the appellee recover in this action upon a patent for this product, to wit, a metal ring enveloped in a composition of artificial ivory or a similar material?

"It is evident, from what has been already said, that a patent for the manufacture of a metal ring enveloped in a composition of ivory or similar material is void for the want of novelty. Such is the testimony of the expert witnesses on both sides, as well as an inevitable result from

[1] Namely, English patent of 1851 to Newton for covering iron with caoutchouc or gutta-percha; and the English patent of Edward Benton, enrolled in the year 1843, for covering rings, &c., with "an enamel or vitreous composition," formed in moulds; and the English patent to Barnwell and Rollanson, dated 1860, which said: "We make toys, &c., by employing moulds or dies of any suitable material for which our composition has no affinity, or to which it will not adhere."

an examination of the English patents heretofore referred to. Indeed, we do not understand the counsel as contending that the patent can be sustained if this is held to be its construction."

THE KEROSENE LAMP-HEATER CO. *v.* LITTELL, 13 O. G. 1009.

D. OF N. J., 1877. McKENNAN AND NIXON, JJ.

Reissued patent, 7069, dated April 18, 1876. The fourth claim was

"the combination of a kerosene-oil lamp, a metallic shell adapted to support a vessel to be heated, and a window made of transparent material in the walls of the shell, substantially," &c.

Of this the court, Nixon, J., said: —

"I have spent no time on the fourth claim, because, in view of the state of the art at the time of the original patent, there would seem to be no invention in placing a window in the walls of the metallic chamber, whether it was designed to give light in the room, or for the inspection of the flame. The device is old, and it is the merest aggregation to link it with other elements in order to make it the subject of a separate claim."

HERRING *v.* NELSON, 14 BLATCH. 293.

N. D. OF N. Y., 1877. JOHNSON, J.

Patent reissued to John Deuchfield, Jan. 16, 1872, for an "improvement in cooling and drying meal," as it comes hot from the millstones.

One claim of the patent was for a combination of machinery for cooling and drying the meal, with machinery for preventing waste of meal in the process. This was alleged by the defence to be a mere aggregation, and not a combination; but the court, as we shall presently see, held otherwise. Briefly, the arrangement was as follows: The meal was conveyed in spouts from the millstones to a chest, within which was a longitudinal shaft having a spiral flange and a zigzag partition with openings. From this chest, by the operation of the spirally flanged shaft, the meal was conveyed into an elevator, whence it was

discharged into bolts or troughs. Meanwhile, in its passage through the spouts and chest it was cooled and dried by a suction-blast produced by a fan in a box, which box was connected with one end of the chest by a spout. This was the cooling and drying machinery. That for the prevention of waste was as follows: The spout which at its lower end opened into the chest, at its upper end (after passing through the box containing the fan) led into one end of another chest, which also contained a longitudinal shaft having a screw or spiral flange, &c. Some of the finer and lighter particles of meal followed the blast created by the fan (instead of going, with the bulk of the meal, from the main chest into the elevator), and passed up through the spout into this second chest, and settled in the outer end thereof, whence, by an opening opposite to that at which the spout entered, they were conveyed by the flanged shaft to a spout, and so into the elevator, which receives the main body of the meal, coming directly from the main chest.

Upon the claim for this combination the court remarked: —

"It is further claimed on the part of the plaintiffs that the claim under the original specification [in the reissue, the second claim] was not of a true combination, producing a result from the co-action of the elements, but that the results were the consequence of the successive and independent action of the parts, each producing its own result. In a certain sense this would seem to be true; because the cooling of the meal may be conceived of as one independent result, and the saving and restoring to the common mass that part of the meal which, in the cooling process, has been mechanically separated from the rest, may also be conceived of as another independent result. But this, in my opinion, is an over-refinement, not required by the principles of the patent law when regarded as part of a practical improved arrangement of means for converting grain into flour. Both results, the cooling and the saving, contribute to the one common result, — cooling without waste, and thus getting the largest practical amount of merchantable flour. It cannot be doubted that if the whole process of reducing grain to flour were new, the complete machinery employed, even including the combined Deuchfield device, could be included and maintained in a single patent, or in a single combination. This view is, as I understand it, supported by the decision of Mr. Justice Curtis in Forbush *v.* Cook.[1] . . . The case is one not of juxtaposition merely, but of combination, in the sense of the law."

[1] *Vide ante*, page 423.

On another point the court remarked: —

"The rejected application of Mann for a patent is not to be considered as a bar to the patent represented by the plaintiffs. The Corn-Planter Patent, 23 Wall. 181. Assuming its similarity to the Deuchfield device, the rejected application does not make out that the thing described was ever used; nor is such a description a patent or publication within the statute."

In a subsequent suit on this same patent,

BIGNALL *v.* HARVEY, 18 BLATCH. 353,

N. D. OF N. Y., 1880, BLATCHFORD, J.,

two prior foreign patents were set up by the defence. One, a French patent, is not described in the report; the other was the English patent of Joseph Robinson, dated Dec. 8, 1853.

Of this the court said: —

"The Robinson patent cannot be held to be an anticipation. It is clear from the drawings of the plaintiff's patent that the curbs of the mills are open curbs, as distinguished from close curbs; that is, are the open curbs which were in general use in American mills at the time. Open curbs are curbs or covers over the upper millstone, provided with a circular opening over the eye of the upper stone. This enables the air in the plaintiff's arrangement to pass over the top of the upper stone and through the annular space between the outer edges of the stones and the inside of the curb, and thence with the meal through the closed meal-spouts into and through the closed meal-chest. In the Robinson patent the small orifice in the centre of the top of the curb is tightly stopped up by a tube which extends downward into the eye of the upper stone, the outside of the tube fitting the interior of the eye. The object must have been, as the necessary operation was, to prevent the passage of air over the top of the upper stone inside of the curb, and to force it to go down into the eye, and between the grinding faces of the stones. Thus the operation is the reverse of that in the plaintiff's patent. Moreover, Robinson has no current of air traversing the length of the meal-chest, and carrying off the moisture which rises from the meal as the screw-conveyer operates upon it. The elements combined in Robinson's are not there combined in the same way as in the plaintiff's patent, to produce the same results by the same mode of operation."

MAHN *v.* HARWOOD, 14 O. G. 859.

D. OF MASS., 1878. CLIFFORD AND LOWELL, JJ.

James H. Osgood's patent, reissued April 11, 1876, No. 7046. The third claim only of the reissue was in suit:—

"The covering of a base-ball, consisting of an outer and an inner covering, each of which is composed of two pieces of leather, and applied to the ball independently of each other, substantially as and for the purpose specified."

The object of the two covers was to make the ball fit for severe usage. The core of the ball was of cork or india-rubber, with yarn wound about it.

"The patentee," said Lowell, J., "was the first to combine the double-leather cover (which was well known on balls made of 'gimpings,' with yarn wound round them, and on other forms with [of?] ball) to a ball of a harder kind, equally well known, but which before had been used with single-leather cover or with none. But we are of opinion that such a combination is not patentable.

"It is not claimed in the patent, and does not appear to be true, that any new or different effect is sought to be obtained, unless perhaps in degree, by the double cover, as applied to the one ball rather than the other. A changed mode of playing the game required a harder ball, and one of well-known form was adopted; and to it was added the second cover, which was also well known, and often used in the softer balls. This is a change of form which appears, in view of the state of the art, to be within the line of ordinary mechanical adaptation, and nothing more."

JUDSON *v.* BRADFORD, 16 O. G. 171.

D. OF MASS., 1878. CLIFFORD, J.

Catherine Judson's reissued patent, No. 7729, dated June 12, 1877, for an improvement in corset-springs.

Clifford, J.:—

". . . My invention, says the patentee, relates particularly to that portion of a corset known as the clasp or spring, and is intended to strengthen the clasp or busk, and especially at that portion of the same near the natural waist, where breakage is most liable to occur. Strength is imparted to the clasp or busk by means of an additional supporting

steel or spring, fixed immovably upon the wide steel or busk at two points, having its ends free, one above and the other below the waist or centre of the busk. Improvements of the kind, the patentee admits, have been patented, which include additional strengthening-steels, unfastened or fastened at the centre to the main steel; but she alleges to the effect that her improvement, which is fastened at the two points named, is better than those previously patented, because the steels between the points of fastening are kept stiff by the fastenings, and help to support each other, while, if they were merely fastened at the centre, the additional strength would only be that of an unaided steel as weakened by the fastening process. Decided merit is also claimed for the patented improvement, because the studs, in order to strengthen the clasp, are placed near the edge of the busk which is farthest from the fastening-spring, which it is said is the reverse of the usual position, and brings the fastening-spring over the strengthening-steel and over the centre of the busk. Combined as the three steels are under the described arrangement, it is clear that the clasp is much strengthened; and the patentee states that even if the strengthening-steel be omitted, still the arrangement is better than those in prior use, as the fastening-steel, instead of lying upon the side of the busk, will be upon its centre, inasmuch as the studs are upon the left instead of the right side. Minute description is then given of the several devices embodied in the patented improvement; and the function which each performs is clearly delineated by reference to the drawings, from which it is clearly shown that the clasp is strengthened in two ways: first, by the position of the fastening-spring hooking over to the farther side of the busk; and, secondly, by the short steel spring placed near the centre of the clasp-springs at the natural waist, where the springs are most liable to be bent and strained.

"Special reference will only be made to the second claim, for the reason that the charge of infringement, as made in the argument, applies exclusively to that claim which is for 'a busk or spring in a corset-clasp having its studs or fastening devices placed near the edge, farther from that side of the busk or spring over which the fastening-spring is brought to be attached to said busk or spring, thus causing the said fastening-spring to lie upon said busk or spring near its centre or farther edge, for the purpose set forth.' Beyond all question, the invention, as the patentee states, relates to that portion of the corset generally known as the clasp or springs; but the court is of the opinion that the invention in question, when viewed in connection with the descriptive portion of the specification, may be considered as a combination of old elements into an improved busk or clasp, provided with studs placed as described, and combined with the described overlying

spring, the whole apparatus or contrivance constituting an improvement in corsets. . . .

"Two narrow corset-springs were formerly used by manufacturers of the article; the fastening-spring having clasps to hold the corset together when closed around the waist of the wearer, the studs upon the busk being placed near the inner edge thereof toward the fastening-spring, thus bringing the two springs adjacent to each other. Difficulties attended that mode of arranging the springs, as all the witnesses agree. Inconvenience resulted to the wearer, as it became necessary, in order to fasten the corset, to bring the two springs together, which frequently had the effect to pinch the under-garment and to cause the springs to break, rendering the corset valueless before it had been much worn. Efforts of various kinds were made to obviate these difficulties, but the efforts were not attended with much success prior to the patent in controversy. Plans of various sorts were devised; but the plaintiff, it appears, conceived the idea of placing the studs in a wide busk on the farther edge thereof from the clasp or fastening, which brings the clasp when fastened in a central position over the busk, thus giving strength and stability to the corset-springs."

The learned judge also considered two prior patents set up by the defence; namely, the Schneller patent of Sept. 10, 1872, and the Drew & Bayliss patent of Aug. 26, 1873, as follows:—

"Two of the claims of the patent first named are referred to. . . . Of these, the first is a claim for a corset-spring composed of two blades of steel or other flexible and elastic material, one of the blades being made to cover the other, when the two parts of the corset-spring are connected by means of the described hooks, having rounded backs and curved on the inside, as set forth.

"Unlike the first, the other, which is the third claim of the patent, is for a corset-spring composed of three blades of elastic material, one blade forming the clasp and covering the other two blades, when all are brought in position, said blades being so adapted as to be connected together by hooks having rounded backs, as described.

"Prior explanations in respect to each of these claims are given in the specification. In respect to the first, the patentee states that the invention consists in a corset-spring, composed of two blades of steel or other flexible and elastic material, so arranged that when the parts of said spring are connected one of said blades covers the other blade or blades, thereby increasing the strength and elasticity of the device, and preventing the same or any part thereof from turning edgewise, or from leaving an open space between the two ends of the corset; the patentee adding, that the blades are connected together by hooks having rounded

backs, and that, being curved on the inside, they approach each other closely, as lateral strain is exerted.

"Pertinent explanations are also made as to that part of the invention secured in the third claim, which are, that it consists in a clasp for a corset-spring composed of a single blade, in connection with two other blades made like ordinary corset-steels, both of them being provided with hooks to catch in holes in the covering blade; the two described blades being covered by the one first mentioned, by which their strength and elasticity are increased, and they are effectually prevented from turning edgewise, or from leaving an open space between the ends of the corset.

"Argument to show that the first patent introduced by the defendants is substantially different in its devices, combination of parts, and mode of operation from the improvement patented to the plaintiff is quite unnecessary, as the proposition becomes self-evident by a careful comparison of the two specifications. . . .

"Improvements in stay and other like fastenings were patented to Drew and Bayliss prior to the invention of the plaintiff; but their invention related chiefly to the manufacture of stay-fastenings, the object of the inventors being to provide a simple construction of fastening which would admit of the stay being readily removed from the body of the wearer; and to that end they attached the busk of the stay to one edge thereof, and to the other edge they secured a thin strip of steel, caused to overlay the former by providing it with slots to receive studs projecting from the face of the busk.

"Means for disengaging the overlaying strip are also described, which is accomplished by bending the busk forward, the effect of which, as represented, is to bring the studs forward to the enlarged ends of the slots and to disengage the overlaying strip.

"Fastenings, as the patentees represent, may be constructed, in the mode suggested, on the edges of the steel. Strips may be constructed so as to abut against each other, in which event the studs or hooks must project from the side of one steel strip so as to enter into the slots of the other. Particular description is also given of the busk, the language of which it is unnecessary to reproduce, as the claim of the patentee is only for the construction of the fastening, as described and shown in the drawings. Unlike as the improvement described in that specification and the patented improvement of the plaintiff are, the court is of the opinion that no remarks are necessary to show that the former has no tendency to show that the plaintiff is not the original and first inventor of the improvement described in her patent."

The plaintiff's invention was made as early as May 21, 1875. An earlier experiment was thus disposed of by the court: —

"Take what he [a witness] says to be true, and it only shows that he made the corset in March or April, 1875, without showing that it was ever put to practical use, and the witness states that he never made but one of the kind, and that it has remained in his office ever since. . . .

"1. . . . The reasons given by the witness for recollecting the date are unsatisfactory and insufficient.

"2. . . . The testimony, if true, is not sufficient to establish the defence, as it fails to show that the exhibit was ever put in practical use, or that any one except the witness had the required knowledge of its existence."

The following general remarks on the same subject also occur in the opinion: —

"Prior knowledge of the thing patented, and where and by whom it has been used, are required to be stated [in the answer], which shows very clearly that, in order to defeat the patent in suit by such a defence, there must have been some use of the alleged prior invention. Mere discovery of a patentable improvement does not constitute it the proper subject of a patent, unless it be embodied, if a machine, into working machinery and adapted to practical use. Whoever first perfects a machine and makes it capable of useful operation is entitled to a patent. Reed *v.* Cotter, 1 Story, 594. Such were the views of Judge Story; and he held that the person is the first inventor, in the sense of the Patent Act, and entitled to a patent, who has first perfected and adapted the invention to use, and that until the invention is so perfected and adapted to use it is not patentable under the patent laws. Washburn *v.* Gould, 3 Story, 122; Woodcock *v.* Parker, 1 Gall. 438; White *v.* Allen, 2 Cliff. 230; Seymour *v.* Osborne, 11 Wall. 539. Crude and imperfect experiments are not sufficient to confer a right to a patent, but in order to constitute an invention the party must have proceeded so far as to have reduced his conception to practice, and have embodied it in some distinct form. 11 id. 552.

"All these cases show that evidence of mere knowledge without use is not sufficient to defeat a patent valid in form; but since the decision in the case of Coffin *v.* Ogden (18 Wall. 120), it must be considered that the evidence is sufficient to support the defence of prior knowledge and use, if it proves that the invention was complete and capable of working, if it had been put in use, and was known to any considerable number of persons."

ROGERS *v.* ENNIS, 15 BLATCH. 47.

N. D. OF N. Y., 1878. BLATCHFORD, J.

Patent granted to the plaintiff, July 10, 1877, for an "improvement in table beverages;" also another, granted Dec. 25, 1877, for an "improvement in birch beer."

Infringement was admitted, but the patentability of each compound was contested.

The claim of the first patent was: —

"The composition as a table beverage, consisting of water, sugar, oil of wintergreen, alcohol, yeast, and burnt sugar, in the proportions substantially as described."

The claim of the second was: —

"The improved material herein described for producing beer, called birch beer, and consisting of water, sugar, oil of birch, alcohol, home-made yeast, and burnt sugar, in the proportions substantially as specified."

The specification of each patent gave directions for making the compound in the proper proportions.

Said the court: —

"The defendant contends that all the plaintiff did was to put into the beer the oil of wintergreen in the one case, and the oil of birch in the other; that the plaintiff invented no new process of making the beer; and that . . . the mere putting into the compound the oil of wintergreen or the oil of birch, as a flavor, is not a useful improvement within the patent laws. The defendant further contends that the use of the oil of wintergreen or the oil of birch in the compound is not the use of any material or substantial part of the compound, so as to authorize a granting of a patent for the compound, the use of the other materials to form the compound not being new. These patents stand on narrow ground, but yet the defendant has infringed each of them, by using the exact formula laid down by the patentee in each case.

"The compositions of matter are shown to be useful, agreeable to those who use them, profitable to the plaintiff through his manufacture and sale of them, and new. This constitutes patentability. . . . It appears in evidence that the bark of the birch-tree had been previously used as flavoring matter for a beer; that the plaintiff found he could get a stronger and better flavor, at less expense, by using the oil of wintergreen, the flavor of which is like that of black birch; and that he

afterwards substituted the oil of birch for the oil of wintergreen, with some other slight changes of ingredients and treatment."

In another case, Rogers *v.* Beecher, 3 Fed. Rep. 639, N. D. of N. Y., 1880, Wallace, J., the same patents were sustained.

WILLIAMS *v.* THE ROME, WATERTOWN, & OGDENSBURGH RAILROAD CO., 15 BLATCH. 200.

N. D. OF N. Y., 1878. BLATCHFORD, J.

This case is set out at length, *ante*, page 402. It was followed by that of

WILLIAMS *v.* THE BOSTON & ALBANY RAILROAD CO., 17 BLATCH. 21.

N. D. OF N. Y., 1879. WALLACE, J.

Wallace, J.: —

" . . . In that case [Williams *v.* The Rome, &c. R. R. Co.] the validity of the issue of the complainant's patent was necessarily determined, as was also the novelty of the several combinations claimed, so far as this was assailed by the patents then introduced as anticipations. Not only did Judge Blatchford sustain as patentable the entire combination which complainant's organized locomotive lamps embraced, but also the sub-combinations covered by the several claims in the patent. In the present case, therefore, it must be held that, although the subordinate combinations will not produce a useful result without the addition of other parts necessary to make a locomotive lamp, they are nevertheless sufficient to sustain the patent, because by their co-operation they contribute to a new result, and may be used in conjunction with such other parts as are ordinarily employed in locomotive head-lights. It then becomes necessary to ascertain whether the novelty of any of these combinations is disproved by the patents and devices now relied on as anticipations, which were not introduced in the former case. . . . Every claim of the patent except the fifth covers a combination of which the hollow wick-tube and cap-deflector are parts. The fifth claim is for the combination of the hollow wick-tube, lateral oil-reservoir, and perforated air-screen for the interior current of air, substantially as set forth. The Quincy & Johnson patent [set up as anticipating Williams's] discloses a device called a 'blower,' interposed between the cap-deflector and hollow wick-tube, which, it

would seem, is a necessary feature in their arrangement as respects each other, and materially affects their mode of operation, and which suffices to distinguish the construction and arrangement of these parts from the complainant's. This patent is, however, in my judgment, an anticipation of the fifth claim of the complainant. The orifices which admit the air for the interior current, together with the interior screen, are equivalents for the complainant's devices, and break up the current of air sufficiently to prevent material flickering of the flame from the pressure of air in the head-light. The differences between the wick-tube and the lateral oil-reservoir of Quincy & Johnson and those of the complainant are not substantial."

IMHAEUSER *v.* BUERK, 101 U. S. 647 (1879).

Buerk's patent of June 6, 1865, No. 48,048, for an improvement in watchman's time-detectors.

This case is too complicated and elaborate for our purpose; and it turned chiefly upon the question of infringement.

The same patent was sued on in Buerk *v.* Valentine, 9 Blatch. 479, N. D. of N. Y., 1872, Woodruff, J., where also an older patent of Buerk's, reissued Aug. 22, 1865 (and again reissued March 8, 1870, for the term of fourteen years from Oct. 29, 1856), was sustained against prior devices set up in defence.

PARKS *v.* BOOTH, 102 U. S. 96 (1880).

Booth's reissued patent of Nov. 29, 1864 (No. 1826), for an improvement in grain-separators.

The patent was for a combination, which the court upheld. Clifford, J., delivered the opinion as follows:—

". . . Speaking directly to the point, the patentee states that his invention consists in the employment or use of zigzag screens and boxes or passages having a proper lateral shake-motion communicated to them, and so arranged that the grain may pass consecutively over and through them, and be subjected to a thorough screening operation. Also using, in connection with the zigzag screen and boxes, a revolving fan and spout, so arranged that the grain will be subjected to a sufficient blast for the separation from it of all light impurities. Reference is then made to the drawings, which show the frame of the machine and

the manner in which the series of devices called inclined screens are secured by elastic pendants, as more fully explained in another part of the specification.

" Explanations follow, which show that the screens may be formed of perforated zinc or other sheet-metal, placed alternately in reversed inclined positions, as is clearly seen in Fig. 2 of the drawings; each screen being placed at the top of what is termed a shallow box, which forms the passage of the grain, the boxes extending the whole length of the screens, in order to receive the grain and discharge the same on to the elevated end of the screen next below, through openings constructed for the purpose, in order that the screening operation may be continued through the whole series of screens."

The report contains no further description of the invention, and none at all of the prior patents set up; but these, the opinion states, were all for single elements of the plaintiff's combination, and therefore they did not affect its patentability.

" If it were allowable," said the court, " to test the validity of the invention in question by comparing the same with the whole, as if embodied in a single exhibit, the evidence might be sufficient to support the views of the respondents in respect to the defence under consideration. Were that allowable, it might well be suggested that the screen is found in one, the box in another, and the means to produce the lateral shake in a third, and so on to the end; but it would still be true that neither the same combination in its entirety nor the same mode of operation is described in any one of the patents or printed publications given in evidence." [1]

HOFFMAN *v.* YOUNG, 2 FED. REP. 74.

E. D. OF PENN., 1880. BUTLER, J.

Combination of a shifting device with a device for horizontal adjustment in a surveyor's tripod, held to be patentable.

The court: —

" It would seem, however, from the decisions that two things are always necessary: first, a novel assemblage of parts exhibiting inven-

[1] The question whether this combination was a true, patentable combination, and not a mere aggregation, does not seem to have been considered by the court, unless such a consideration is implied in the passage just quoted.

tion; second, the co-operation of the parts in producing a new result. By the term 'co-operate,' however, the courts do not mean merely acting together or simultaneously, but unitedly to a common end, — a unitary result. Each and every part must have its subfunction to perform, and each must have a certain relation to and dependence upon the other."

SLAWSON *v.* GRAND STREET, PROSPECT PARK, & FLATBUSH RAILROAD CO., 17 BLATCH. 512.

E. D. OF N. Y., 1880. BENEDICT, J.

Slawson's reissued patent, No. 4240, dated Jan. 24, 1871, and Middleton's patent, No. 121,920, dated Dec. 2, 1871.

The first was for the combination of a window with the well-known fare-box, the window being placed so that the passenger might see his money after putting it into the box. The old fare-box had a window through which the driver could see the money.

The court: —

"The additional window, it is true, permits the transmission of light through a part of the box where before it could not pass. But it accomplishes this result without aid from any other part of the machine, and in so doing it in no way modifies the operation of any of the other parts. There is, in fact, no joint operation, and the case is one of simple aggregation, not combination.

"Furthermore, all that the plaintiff did was to duplicate one of the features of the machine. Some convenience, doubtless, resulted from this duplication, but the effect produced by the additional window was the same in kind as that produced by the existing window, and accomplished in the same way."

The judge also compared this case with that of Hailes *v.* Van Wormer, 20 Wall. 353, and he held that the latter compelled the conclusion at which he had arrived with regard to the former.

The other patent was even more frivolous, being for such a combination of fare-box, headlight of the car, and reflector, that the light should be thrown into the fare-box.

The court: —

"No invention was required to so arrange these parts. It would not fail to be accomplished by any person of ordinary intelligence and experience who should attempt it."

HOE *v.* COTTRELL, 17 Blatch. 546.

D. of Conn., 1880. Shipman, J.

Letters-patent, granted March 16, 1869, to Richard M. Hoe, assignee of Auguste Hippolyte Marinoni, for an improvement in lithographic printing-presses.

The claim ran as follows: —

"The combination of the sheet-flier with an impression-cylinder without tapes, and a receiving-cylinder provided with both gripers and tapes, substantially as described and specified."

The court: —

"The object of the invention was to have the whole surface of a sheet of paper printed with heavy color on the impression-cylinder, and to be delivered automatically, without smutting, face-side uppermost, on the fly-board or table. . . . If there was invention in this combination, and the patentee was the first inventor, the claim is not invalid upon the ground that the sheet-flier and impression-cylinder have no conjoint action and no active connection to produce a joint result. The combination is of the class mentioned in Forbush *v.* Cook (2 Fish. 668), in which case Judge Curtis says: 'To make a valid claim for a combination, it is not necessary that the several elementary parts of the combination should act simultaneously. If these elementary parts are so arranged that the successive action of each contributes to produce some one practical result, which result, when attained, is the product of the simultaneous or successive action of all the elementary parts viewed as an entire whole, a valid claim for thus combining these elementary parts can be made.'"

The result attained in this case was the automatic delivery of a sheet, automatically printed upon its broad side with heavy color, without smutting, face-side uppermost. This result was the product of the successive action of all the elementary parts.

It was admitted that all the elements of the combination were old, and the objection was made that to put them together required no invention.

The court remarked upon this point: —

"Looking at the question from the present standpoint of time, it is very difficult to point out satisfactorily to one's self the changes which required invention. If he [*sic*] looked merely at the simplicity of the

combination, and at the ease with which it now seems that anybody could have accomplished the result, the conclusion would be irresistible that there was no combination."

But, it being proved that some change was necessary to adapt the elements to the combination, the court held that such change must have required invention, inasmuch as the combination, which was of immense utility and value, had never been hit upon before, although about eighteen hundred patents upon printing-presses had been granted in England, France, and the United States.

"When a device has a new mode of operation," the court added, "which accomplishes beneficial results, 'courts look with favor upon it,' and are not exacting as to the degree of inventive skill which was required to produce the new result. There must be some, but a little will suffice. Forbush *v.* Cook, 2 Fish. 668; Middletown Tool Co. *v.* Judd, 3 Fish. 144; Stimpson *v.* Woodman, 10 Wall. 117.

THE DOUBLE-POINTED TACK CO. *v.* THE TWO RIVERS MANUFACTURING CO., 18 O. G. 683.

E. D. of Wis., 1880. Dyer, J.

Patent for the invention of one Miles, issued to complainants Feb. 10, 1874. The improvement was in bail-ears used upon pails.

In the specification the inventor said: —

"Wire staples have been employed to form the fastening-eyes for bails, and these have been driven into the wood with the penetrating points nearly at right angles to the surface, and in use they are liable to pull out by the weight. . . .

"My invention consists in a bail-fastening staple made of wire, with the penetrating ends cut at such an angle that in driving them into the wood they will assume an upward inclination, so that the weight will tend to force such points inwardly rather than to draw them out, and the bending of the ends in clinching will always be upwardly, thus making a much better and more reliable article than heretofore; and I combine with such fastener a convex metallic washer, to keep the bail from contact with the wood or the paint thereon."

There were two claims, one for the fastener, and the other for the combination of fastener and washer (the washer being old). Of this second claim the court said: —

" . . . It is not perceived how the washer can be said to co-operate with the bail-ear in the production of a common result. It may give greater finish to the pail, and prevent the bail from rubbing and disfiguring the wood at the point where the bail is fastened to the ear, but the union of the two devices does not contribute necessarily to one or the same result, and does not involve invention. . . . The addition of the washer, which is an old device, makes a mere aggregation of parts, in which each device performs its separate function without producing anything new in operation or result by the combination."

As to the claim for the fastener, the staple, the court summed up the evidence, and stated its conclusion as follows: —

" All this shows that the idea of a diagonal cut on the penetrating points of staples was not new with Miles, and that all that he can claim as new with him is the diagonal cut on the same sides of the two points, and the angle at which the points run from the body of the staple, as shown in his device. This is what Miles invented, and nothing more; and since we find that the form of the body of his staple and the diagonal cut of the penetrating points were old when he devised his staple, I am of the opinion that the angle at which the prongs run from the body of the staple, and the fact that in his device both points are cut diagonally on the under side, do not give to the device such originality and novelty as are essential to patentability; nor in my judgment can the mere fact that it is so constructed as to be adapted to use upon pails make it patentable.

" The leading feature of complainants' device, though it may give to it utility and value, seems to have been produced rather by mere change of form from that of devices which preceded it than by originality of construction. The adjustment of parts is purely mechanical, and in the previous state of the art required only the exercise of mechanical skill. A staple with one point bevelled on one side, and the other point bevelled on the opposite side, was old.

" It was common knowledge that as the points should be driven into the wood they would be forced in different directions, because each point would be pushed in an opposite direction from the bevel. Now, the construction of a staple so that both points should be bevelled on the same — that is, the under — side, thereby causing both points when driven into the wood to incline or bend in the same direction, — that is, a direction opposite the bevel, — would seem to be, in the language of

the Supreme Court, 'but the carrying forward, or new or more extended application, of a thought original with others,' or well known in mechanics, and not such an invention as will sustain a patent."

LOOM CO. *v.* HIGGINS, 105 U. S. 580 (1881).

William Webster's patent of Aug. 27, 1872, No. 130,961, for "improvements in looms for weaving pile fabrics," &c.

Mr. Justice Bradley delivered the opinion of the court.

After describing the state of the art when the invention patented was made, he said:—

"Turning now to the invention claimed by Webster, and described in the patent under consideration, we find that, although it produced a great improvement in the art of weaving pile fabrics, yet, as actually exhibited in conception and accomplishment, it seems simple. The thing to be done was to combine the advantages of Bigelow's rigid lathe, divested of some of its defects, and his constant command of the wire, with Weild's trough, or wire-bar, for supporting the wire. This Webster, or, if not Webster, some other person, effected by the devices and mechanisms described in the patent. Stated in brief, . . . the problem was solved by substituting for Weild's pusher a latch which rides on the wire-bar or trough, without projecting beyond it, and which receives a reciprocating motion backward and forward on the bar, either by being connected with a driving-slide moving on the breast-beam, or by being directly connected with an upright reciprocating lever. The latch, when the end of the wire-bar next to the loom oscillates or vibrates to the front of the wire-box, drops upon a wire-head into a nick or notch made therein, and withdraws the wire into the trough, and then, when the latter oscillates back to the shed, without releasing its hold of the wire-head, drives the wire into the shed, and is then lifted out of the notch by striking the edge of the wire-box sloped up for that purpose, and releases the wire; and then oscillates forward again to seize another wire; and so on. The lathe, in the mean time, works backward and forward without meeting any obstruction, and without any detachment or separation of its parts. Very little modification had to be made in the cams, and the whole apparatus, or wire movement, as it is called, seems more simple than it was before, either in Bigelow's or Weild's loom. This contrivance, when actually applied to the looms, worked to perfection, and enabled the weaver to drive his loom to its utmost capacity.

" . . . The patent has five claims, only the fifth of which is relied on in this case, which is as follows: —

" 'In combination, the lay and its rigid shuttle-box, the pivoted vibrating wire-trough, the reciprocating driving-slide and the latch moving thereon, the latter being operated by the wire-box, the combination being and operating substantially as described.'

" With the explanation of the invention already given, the meaning of this claim is quite obvious. If any explanation of it is needed, it can be readily derived from the body of the specification. The combination contains five elements: 1. The rigid lay and shuttle-box; 2. The pivoted oscillating or vibrating trough; 3. The reciprocating-slide riding on the trough; 4. The latch for taking and holding the wire; 5. The operation or lifting of the latch by striking the wire-box. . . .

" It is argued . . . that the combination set forth in the fifth claim is a mere aggregation of old devices, already well known; and, therefore, it is not patentable. This argument would be sound if the combination claimed by Webster was an obvious one for attaining the advantages proposed, — one which would occur to any mechanic skilled in the art. But it is plain from the evidence, and from the very fact that it was not sooner adopted and used, that it did not for years occur in this light to even the most skilful persons. It may have been under their very eyes, they may almost be said to have stumbled over it; but they certainly failed to see it, to estimate its value, and to bring it into notice. . . . We are constrained to say that we cannot yield our assent to the argument, that the combination of the different parts or elements for attaining the object in view was so obvious as to merit no title to invention. Now that it has succeeded, it may seem very plain to any one that he could have done it as well. This is often the case with inventions of the greatest merit.

" It may be laid down as a general rule, though perhaps not an invariable one, that if a new combination and arrangement of known elements produce a new and beneficial result, never attained before, it is evidence of invention. It was certainly a new and useful result to make a loom produce fifty yards a day when it never before had produced more than forty; and we think that the combination of elements by which this was effected, even if those elements were separately known before, was invention sufficient to form the basis of a patent."

The defence in this case also alleged that one Davis, and not Webster, was the first inventor of the improvement described in Webster's patent. But it was proved that Webster had shown

a drawing of his invention to Davis and to other persons in the year 1870, at which time Davis only began to reduce his invention to a practical form.

BEATTY *v.* HODGES, 19 BLATCH. 381.

S. D. OF N. Y., 1881. WHEELER, J.

We quote the opinion in full.

Wheeler, J.: —

"This suit is brought upon letters-patent No. 185,716, dated Dec. 26, 1876, issued to the plaintiff for an alleged improvement in hats, consisting in extending the sweat-lining well out upon the brim, crimping it over the angle formed by the brim and crown, and stitching it to the brim by stitches passing perpendicularly through the brim outside of the crown-band. The principal defence is want of novelty.

"The evidence shows clearly that hats with sweat-linings extending well out upon the brim, and far enough to be stitched through the brim, outside the crown-band, were well known before the orator's invention, and perpendicular stitching was well known long before. If the crimping referred to in the patent means holding in place by the stitches, which, in this connection, is the literal meaning, then sweat-linings so held were also well known. If it means shaping to the parts of the brim and crown adjacent to the angle formed by them, in the sense of crimping, as the word 'crimp' is sometimes used by boot-makers, the sweat-linings extending out upon the brim were, in the former sense, crimped by the stitches holding them, and in the latter sense by the head of the wearer shaping them over the angle of the brim into the crown, if they were not so shaped before.

"The crimping in the latter sense was probably better done by the plaintiff than it had been done before; but that was merely applying better workmanship to the subject, and not inventing anything new in that behalf. Probably sweat-linings so extending out upon the brim had not been stitched to the brim by stitches extending perpendicularly through it outside the crown-band before. But as such sweat-linings were known, and such stitching was known, all the plaintiff really found out that was new was that such stitches would be useful in that place. This was merely putting old stitches to a new use, and not patentable. The stitches of that sort, and that kind of sweat-lining, may never have been put together in that way before; but whether they had or not, they do not work together to accomplish any new result attributable to their new relations to each other. The sweat-lining would be the same

fastened in some other way that it is fastened by these perpendicular stitches. Hailes *v.* Van Wormer, 20 Wall. 353; Reckendorfer *v.* Faber, 92 U. S. 347.

"Let a decree be entered dismissing the bill of complaint with costs."

FITCH *v.* BRAGG, 8 FED. REP. 588.

D. OF CONN., 1881. SHIPMAN, J.

Patent No. 47,764, granted to C. B. Bristol, May 16, 1865, for an improved snap-hook.

Shipman, J.: —

". . . Bristol's invention [quoting from the testimony of Mr. Earle, the plaintiff's expert] 'is an improvement in that class of snap-hooks in which the tongue is pivoted in a recess between two cheeks in the shank. In this recess a coil-spring is arranged around the pivot, so that the two ends of the spring bear, one upon the tongue and the other upon the body of the hook, tending to press the tongue up against the end of the hook, but yet permit the tongue to be depressed to open the hook. In this class of hooks, prior to Bristol, the tongue was cast with a recess upon its under side to form two cheeks corresponding to the cheeks in the shank of the hook. The cheeks or the tongue were drilled corresponding to the hole through the cheeks in the shank, so that a rivet could be inserted through the sides of the shank and both sides of the tongue, to form the pivot on which the tongue would turn. The coil of the spring was arranged around the pivot, the two ends bearing, one upon the shank and one upon the hook, as before described.'

"'The invention of Bristol . . . consisted in constructing the tongue with a recess upon one side, opening outward, through which one arm of the spring must project to bear upon the hook. In this recess the coil of the spring was placed. The advantages of this method of construction were those of economy of material and ease of manufacture. Besides, dirt and foreign substances could not collect in an open recess.

". . . The first claim, and the only one infringed, was for

"'The combination of the tongue, *g*, with the spiral spring (figure 4), when the spring works on the tension principle, and rests in a recess (as 14) in the rear end of the tongue, substantially,' &c. . . . The defendants . . . insist that the claim, if so construed, is invalid, because, if the invention consisted in a combination of a tongue having a

peculiar recess with a spring, the form of the recess does not affect the spring, and consequently the claim is for a mere aggregation of parts.

"There must be a combination of spring and tongue, and the spring must be placed where it can actuate the tongue. The old location was in a channel formed between the two cheeks of the tongue. The location was objectionable, not because the spring did not cause the tongue to snap easily, but because another location would be more economical, and would keep the hook more free from dirt.

"The new combination was of spring and recessed tongue, the recess being so constructed that by means of the new location of the spring a new and beneficial result was attained. It was not material whether the benefit was to the spring or not, but it is material that the benefit should be the result of the new combination. The combination in this case does not fall within the principle of Hailes *v.* Van Wormer, 20 Wall. 353, which condemns a combination creating no new effect as its result."

McKESSON *v.* CARNRICK, 19 BLATCH. 158.

S. D. OF N. Y., 1881. BLATCHFORD, J.

P. Cauhapé's patent of Jan. 3, 1871, for an improvement in pill-machines.

The only claim in suit was the second, which was for

"The *combination* of the moulds, A, with the comb-bar, B, substantially as and for the purpose specified."

The comb-bar B held a row of needles or pins corresponding to the cavities in the mould. The comb-bar being moved over the mould, the pins passed into the pills in the cavities of the mould and took them up, to be dipped in glycerine or other liquid used for coating the pills.

Judge Blatchford thus described the manner in which the combination operated: —

"The pill-holder is to have a number of cavities, so as to secure rapid work. There are to be as many needles as there are cavities. The manner of the combination is to have a groove extending from each cavity when the two parts forming the holder are closed, so that the needle may pass through the groove into the pill, and the pill be retained on and moved with the needle when the two parts of the holder are separated, so that the pills on all the needles may be removed at once, and be dipped on the needles all at once into the coating solu-

tion. That is the purpose specified. The result of this rapid work is a greater number of pills created in a given time, and thus a reduction of cost."

And the learned judge thus sustained the validity of the combination: —

"It is also objected that there is no combination between the comb-bar and needles and the pill-holders, but only an aggregation of parts. This is an erroneous view.

"The pill-holder holds the pill while the needle carried by the comb-bar is being thrust into the pill. The concert of action takes place when the needle enters the pill; and although such concert of action continues only from the time the needle enters the pill until the pill is removed by the needle from the holder, yet the combination made by such concert of action continues as long as it needs to continue; and the concert of action could not exist at all, so as to impale the pill on the needle, if the pill were not carried by the holder and the needle were not carried by the comb-bar. So, when the needle enters the pill, there is a combination or concert of action between the comb-bar and needle and the holder carrying the pill."

Devices alleged to anticipate the patent were set up in defence, but they are not described in the report.

BATE REFRIGERATING CO. *v.* GILLETT. 9 FED. REP. 387.

D. OF N. J., 1881. NIXON, J.

Patent No. 197,314, dated Nov. 20, 1877, for "improvement in processes for preserving meats during transportation and storage."

As the case is reported, the only question that arose concerned the patentability of the combination described by the patent.

The court thus stated the matter: —

"The patent is a combination comprising two elements or constituents: 1, Enveloping the meats in a covering of fibrous or woven material; and, 2, subjecting the same to the action of a continuous current of air of suitably low or regulated temperature. Neither was new. Meats had long before been covered to keep them from dirt or dust in transportation; and refrigerators had been used to subject them to the action of currents of chilled air, and thus hindering decay.

"But the patentee claims that a new and useful result was found to proceed from the combination; to wit, preserving the natural color or complexion of the meat during transportation, and thus having at the end of the trip a more merchantable article.

"The theory on which the patent rests is that fibrous or woven material has the power of absorbing from the atmosphere the germs which provoke incipient decay on the surface of the meat.' It acts as a filter, straining from the air the animalcula [*sic*] or microscopic particles that tend to discolor the meat or cause putrefaction. The air is supposed to be full of these spores, so minute that they have never been seen or detected with the microscope, and yet so numerous that 3,200,000,000 are capable of being generated on a single square inch of the surface of decaying meat.[1]

"Whether these speculations of the scientists be true or not; whether the preservation of the bloom or natural color of the meat arises from the protection against atmospheric germs that is afforded by the fibrous material with which it is covered, or from some other cause, — I think the weight of the evidence is, that such a result in fact follows, and that the combination of the complainants' patent was the first which revealed it to the public."

The court then detailed the results of a successful trial of the process, and concluded: —

"It seems to be conclusive that the new and useful results claimed by the patentee do follow the covering of the meat with burlaps or cotton cloth, under the conditions set forth in the patent."

There is no further discussion of the patentability of the improvement.

It is plain that if fibrous or woven cloth had been used before as a covering of meat to prevent putrefaction, and if currents of cold air had also been used, separately from the cloth, for the same purpose, then a patent for the use of both would claim a mere aggregation, which is not the proper subject of a patent. Inasmuch, however, as the cloth had not been used for this purpose, but only to protect the meat from dirt or dust (for it is thus that we understand the case), its use, in combination with

[1] If these animalculæ are too small to be seen even with the aid of a microscope, it follows that they cannot be detected by the sense of touch. There remains only that of smell. Are we, then, to conclude that the learned judge, or the expert upon whom he relied, arrived at the exact number of animalculæ by means of that sense?

the cold-air currents, to prevent putrefaction in the manner specified, was the result of a new and an inventive idea.

If this be the true view of the case, it is an instance of new use rather than of combination.

WICKE *v.* OSTRUM, 103 U. S. 461.

UNITED STATES SUPREME COURT, 1881.

Machine for nailing boxes, patented to George Wicke.

The court held that the combination was a patentable one, but that the defendant had not infringed it. Whether or not the patentability of the combination was contested does not appear from the report. It consisted in "grooved spring-jaws, for the purpose of holding the nails and guiding them to their places, combined with a corresponding number of rising and falling plungers, for driving each nail singly and at the same time."

Waite, C. J.:—

" . . . Grooved spring-jaws were, confessedly, very old. So were rods of iron with curvilinear projections, like those called plungers, and cams of almost any shape, and treadles and levers, and adjustable carriage tables and slides. The use of these things separately could not be patented. But the combination of them so as to produce a machine useful for driving nails was new."

COMBINED PATENTS CAN CO. *v.* LLOYD, 11 FED. REP. 153.

E. D. OF PENN., 1882. MCKENNAN, J.

H. Miller's reissued patent, No. 7682, dated May 15, 1877, for an improvement in sheet-metal cans, claiming, as the court held,

" a can or other vessel made of sheet-metal, in which the top or bottom is joined to the sides by a double-recessed clamping lap-joint, soldered by dipping."

McKennan, J.:—

" Is this a new and patentable invention? All its constituents were old and well known at the date of the patent.

"In the English patent to Emile Peltier, dated Aug. 27, 1861, is described a double-recessed clamping lap-joint, of which that described in the patent in question is a counterpart. As cans or boxes embodying this joint were intended to hold gunpowder or other similar articles, the application of solder to it was not contemplated. But the use of solder to add stiffness and strength to metal joints, and to render them impervious to fluids, is immemorial. And in the English patents of Henrietta Brown and Walter Brown, dated in 1850 and 1855, respectively, the application of solder by bathing to metal joints, to render them fluid-tight, is directed and described, and is spoken of as having been before used. The patentee has merely aggregated these elements in his can, without causing them to perform, by their united action, any function which they did not perform separately before. In other words, he has taken the Peltier joint, and rendered it fluid-tight by solder, applied by dipping the joint in a bath.

"In the conception or material embodiment or operation of such a union of well-known elements, we cannot detect any patentable merit, and hence the bill must be dismissed, with costs."

ENGLISH CASES.

LEWIS *v.* DAVIS, 3 Car. & P. 502; 1 Web. P. C. 486.

Lord Tenterden, C. J., and a Jury, 1829.

Lewis & Davis's patent of Jan. 15, 1818, No. 4196, for an improved machine for shearing cloth "by a triangular steel-cutting wire bent round a cylinder in the form of a spiral." The cutter was rotary, and it sheared the cloth from list to list.

Lord Tenterden, C. J., to the jury: —

". . . It appears that a rotary cutter to shear from end to end was known, and that cutting from list to list by means of shears was also known. However, if before the plaintiff's patent the cutting from list to list, and the doing that by means of rotary cutters, were not combined, I am of opinion that this is such an invention by the plaintiffs as will entitle them to maintain the present action."

CORNISH *v.* KEENE, 3 Bing. N. R. 570; 1 Web. P. C. 513.

Common Pleas, 1837.

R. W. Sievier's patent of Jan. 17, 1833, No. 6366, for a new elastic cloth, made by interweaving strands of ordinary india-rubber with cloth of cotton, flax, &c.

"These strands were first covered by winding filaments tightly round them by an ordinary covering machine, and were then arranged as warp threads and stretched to their utmost tension."

After being woven, the cloth was subjected to heat,

"whereby the india-rubber contracted and became elastic, the non-elastic threads forming a limit beyond which extension was impossible, and the relative admixture of materials determining the degree of elastic pressure."

Tindal, C. J., succinctly stated and disposed of the chief objection to the patent as follows: —

"The use of elastic threads or strands of india-rubber, previously covered by filaments wound round them, was known before; the use of yarns of cotton or other non-elastic material was also known before; but the placing them alternately side by side together as a warp, and combining them by the means of a weft, when in extreme tension and deprived of their elasticity, appears to be new; and the result — namely, a cloth in which the non-elastic threads form a limit up to which the elastic threads may be stretched, but beyond which they cannot, and therefore cannot easily be broken — appears a production altogether new. It is a manufacture at once ingenious and simple. It is a web combining the two qualities of great elasticity and a limit thereto."

An unimportant prior device was also set up in this case.

ALLEN *v.* RAWSON, 1 C. B. 551.

Common Pleas, 1845.

Higgins' Dig. p. 18: —

"Where the use of soap and water in the process of felting, instead of acidulated water, was known, and the use of rollers was also known,

it was held that a patent for the application of soap and water in combination with rollers was a good subject-matter for a patent."

A question of anticipation was also raised in this case, and the matter of prior invention was discussed, *vide post*, page 715.

BOVILL *v.* KEYWORTH, 7 E. & B. 724; 3 Jur. n. s. 817.

Queen's Bench, 1857.

G. H. Bovill's patent of June 5, 1849, No. 12,636, with disclaimer, dated May 1, 1855, for "improvements in manufacturing wheat and other grain into flour."

[1] "The patent related to an improvement of great value to millers, which consisted in the combination of a blast of air between the mill-stones used in grinding corn with an exhausting apparatus attached to the chamber in which the stones were enclosed.

"The exhaust-pipe carried away the dust or stive into a separate chamber, where the same was deposited, and the finely ground flour fell into its proper receptacle. The top stone was fixed, and the lower one rotated. The specification stated: 'I introduce a pipe to the mill-stone case from a fan or other exhausting machine, so as to carry off all the warm, dusty air blown through between the stones to a chamber. And this part of my invention relates only to sucking away the *plenum* of dusty air forced through the stones, and not to employing a sufficient exhausting power to induce a current of air between the mill-stones, without the blast, this having been before practised.'

"*Claims* (as amended by disclaimer):—

"1. Fixing the top stone, and causing currents of air, either by exhaustion or pressure, to pass between the grinding surfaces of mill-stones, when the top stone is so fixed, and the introduction of the ventilating pipes in the stones, as herein described.

"2. Exhausting the dusty air, when the same has been blown through the grinding surfaces of the mill-stones, from the cases or chambers receiving the meal, as herein described."

"At the trial it appeared that the alleged infringement consisted in the use of apparatus similar to that specified, except that the *lower stone* was *fixed*, and the upper one rotated. Defendants gave in evidence the specification of a patent of Feb. 11, 1846,

[1] We quote from Goodeve's Abstracts of Patent Cases, p. 51.

No. 11,084, to A. V. Newton, for drawing a current of air between the stones by an exhausting apparatus.

"Verdict for plaintiff.

"Rule *nisi* to enter a verdict for defendants or for a new trial discharged by the Court of Queen's Bench (Lord Campbell, C. J., Coleridge, Wightman, Erle, JJ.)."

Per Lord Campbell, C. J.:—

"The whole of the plaintiff's process, if the combination be new, is certainly the subject of a patent; and so would the part (No. 2) be, if taken separately. . . . The combination of the *exhaust* with the blast, so as to carry off the warm, dusty air blown through between the stones to a chamber above, while the pure flour in a dry condition, without the stive, descended into a chamber below, added to the quantity and improved the quality of the flour produced in grinding; and its effect was highly favorable to . . . the men employed in the operation.

"Still, if the specification does not point out the mode by which this part of the process is to be conducted, so as to accomplish the object in view, it would be the statement of a principle only, and the patent would be invalid.

"But we are of opinion that the specification, on the face of it, cannot (as contended) be pronounced, in point of law, to be bad in this respect, and . . . that the evidence adduced at the trial shows it to be quite sufficient. The specification says: '. . . And this part of my invention relates only to sucking away the *plenum* of dusty air forced through the stones, and not to employing a sufficient exhausting power to induce a current of air between the mill-stones without a blast.' The exhaust . . . is to be proportioned to the *plenum* caused by the blast, taking care not to produce the inconvenient current of air, against which a caution is given. How can a judge take upon himself to say that this may not be enough to enable a workman of competent skill to construct the machinery? According to the evidence, the specification was abundantly sufficient for this purpose. . . ."

MORTON *v.* MIDDLETON, 1 Ct. Sess., 3d Series, 718.

Scotch Court of Session, 1863.

Patent for an improved mode of constructing iron posts and pillars.

The Lord President (one question being whether the patentee

claimed the component parts of the pillar severally, or only the combination of them):—

"There can be no doubt as to the general law that there may be a new arrangement and combination of things that were formerly in use, but which are to be so arranged in a novel way as to produce either a new effect or a better effect than before."

And on the general question:—

"I apprehend none of your Lordships are disposed to hold upon the evidence that there is no benefit to the public resulting from this patent. And although the object of other pillars that have been used may have been the same as the object contemplated by this one, yet if the invention here in a great and material degree attains that object better, then we must hold that there is novelty in it, and that it might be protected by a patent."

FOXWELL *v.* BOSTOCK, 12 W. R. 723; 4 De G., J. & S. 298.

Lord Chancellor, 1864.

Lord Westbury:—

"If a combination of machinery for effecting certain results has previously existed, and is well known, and an improvement is afterwards discovered, consisting, for example, of the introduction of some new parts, or an altered arrangement in some particulars of the existing constituent parts of the machine, an improved arrangement or improved combination may be patented."

RALSTON *v.* SMITH, 11 H. L. Cas. 223.

House of Lords, 1865.

Ralston's patent, granted Nov. 23, 1858, for "calendering" or polishing linen goods, &c., and impressing designs upon them by one and the same operation.

Before this invention such goods were "calendered" by passing them between a roller and a bowl (another sort of roller), revolving with unequal velocities. To imprint them, they were afterward passed between such a roller and an engraved bowl,

revolving with the same velocity; for it was found that if the fabric were passed between the roller and the engraved bowl while they revolved with *unequal* velocities, the fabric was torn by the edges of the cuts upon the bowl.

The patentee discovered that if the engraving upon the bowl were limited to "an infinite series of circular grooves of small diameter," the fabric would be printed upon, and not torn, although the roller and the bowl were revolved with different velocities. Thus, he discovered a way in which the fabric might be calendered and imprinted at once.

At first, in his patent, he claimed the machinery by which this result was accomplished. Afterward, by a disclaimer, he "reduced his patent to a patent 'for improvements in embossing and finishing woven fabrics.'"

It was held in the House of Lords that this was not a new manufacture.

Lord Westbury, L. C., said: —

"I cannot say that my mind is free from doubt upon the subject; but having regard . . . to the operation of the disclaimer, and being of opinion that the specification amended is a description not of a machine, not of a new combination of machinery, but of a new process, I think there is nothing entitled to the character of a new manufacture to be found in that specification."

But he was of opinion that if the patent had been for the new combination of machinery, it would have been good.

Lord Cranworth thought otherwise, on the ground that there was no new machinery. (True; but the combination was new.)

Lord Chelmsford said: —

"The plaintiff does not claim to have invented any new combination of machinery, . . . nor has he introduced to the world any new process [Is it not invention of a new process to combine two old processes, so as to do by one stroke what formerly had required two strokes?]; but the utmost that he can lay claim to is that he has discovered that, by giving a differential motion to different parts of an old machine, a power existing in it might be developed and brought into action. It appears to me that such a discovery is not the subject of a patent."[1]

[1] This question of patentability was not passed upon by the court below.

CANNINGTON *v.* NUTTALL, L. R. 5 H. L. 205.

HOUSE OF LORDS, 1871.

Pocheron's patent of May, 1866 (with a disclaimer of April 4, 1867), for "improvements in the manufacture of glass."[1]

"Before the date of the patent, glass was melted in furnaces of peculiar construction. On each side of the fire, sieges or benches were constructed, upon which were placed a number of earthenware pots. These pots, in which the glass was melted, were large and cumbrous, and their manufacture was costly; moreover, they were very liable to crack, so that their suppression was always regarded as a great desideratum by glass-makers. The patentee, in his amended specification, thus describes his invention: 'My improvements relate to the melting or fusing furnaces or kilns used in glass-making, and have reference to the suppression of the fire-clay pots or crucibles hitherto in use, and to placing the materials to be fused or melted within the furnace itself, the usual inner form of the lower part of which is modified by doing away with the sieges or banks, and the general levelling of the bottom, to which separately I make no claim; but according to my invention, the lateral sides are constructed of a hollow form in such wise that a current of refrigerating or cooling air may be made to circulate around and prevent any excessive heating of the sides which are to retain or enclose the materials in fusion.'"

By prior inventors or experimenters the sieges and the pots had been done away with, and a tank substituted for them. Moreover, the cooling process had been applied to iron, &c., in a similar way (but never apparently to glass in a furnace).[2] But the combination was new, and it was therefore held patentable.

[1] We quote from Higgins' Dig. p. 15.

[2] It does not appear to what extent or with what success the plaintiff had been anticipated in the several elements of his combination. But the decision proceeds upon the assumption that all the elements were old in glass furnaces except the cooling process; in regard to which the Lord Chancellor said: "It is quite apparent, my Lords, that the cooling thing, the current of air, was nothing new: it is as old as the fables of Æsop; it is as old as the man blowing his soup in order to make it cool. But so it is with every invention; the skill and ingenuity of the inventor are shown in the application of well-known principles. Few things come to be known now in the shape of new principles; but the object of an invention generally is the applying of well-known principles to the achievement of a practical result not yet achieved. And I take it, that the test of novelty is this," &c., as in the text.

The Lord Chancellor (Lord Hatherley) thus stated the rule: —

"Is the product which is the result of the apparatus for which an inventor claims letters-patent effectively obtained by means of your new apparatus; whereas it had never before been effectively obtained by any of the separate portions of the apparatus which you have now combined into one valuable whole for the purpose of effecting the object you have in view."

Lord Westbury said: —

". . . Now, the only thing that appears to have been regarded by the patentee, Mr. Pocheron, as a new discovery (*apart from the apparatus*), was the application of the external air to the sides of the tank. It was a discovery, certainly; but it was a thing for which, independently of the other apparatus, probably no patent could have been obtained. I may construct an apparatus, and may, in point of fact, make the merit and the benefit of that apparatus depend upon the application of some natural force or property which is perfectly well known; but my invention consists in the construction of the apparatus in such a manner as to bring the natural agency or power to bear upon and effect the object which I desire to effect, and that I do by means of an apparatus constructed so as to bring into action that natural power. If, for example, I avail myself of the well-known expansive force of steam in order to effect a new object or a more beneficial result, and I introduce that by means of an apparatus constructed for the purpose of bringing this well-known expansive power into utility for my particular purpose, I have no right of invention in the discovery of that expansive power. My invention consists in the arrangement of the apparatus in order to receive that ordinary and well-known dynamic agent, and make it a fit instrument for effecting a new result.

"Here the refrigerating effect of air upon the sides of the tank was not a thing for which, *per se*, a patent could be claimed; but an apparatus so constructed as to bring into operation that particular property of the external atmospheric air, so as to produce a most useful effect, constitutes an invention to which the merit of novelty attaches, and for which a patent may be taken out."

The patent was sustained.

HARRISON *v.* ANDERSTON FOUNDRY CO., L. R. 1 App. Cas. 574.

House of Lords, 1876.

Appeal from the First Division of the Scotch Court of Session. The question involved was merely in regard to the sufficiency of one claim of the patent; but the Lord Chancellor (Lord Cairns) thus described a patentable combination: —

"This combination . . . is novel; it is, to use the words of the Lord President, a new combination of old parts to produce a new result, or to produce a known result in a more useful and beneficial way. It is not doubted that a combination of which this may be said is the subject of a patent."

See also —

Lister *v.* Leather, 8 El. & Bl. 1034.
Saxby *v.* The Gloucester Waggon Co., L. R. 7 Q. B. D. 305.

Less important cases are: —

Wisner *v.* Grant, 7 Fed. Rep. 485, 922.
Stockton *v.* Maddock, 10 Fed. Rep. 132.
Doubleday *v.* Roess, 11 Fed. Rep. 737.

See also, *ante*, —

Seymour *v.* Osborne, page 99.
Bailey Washing & Wringing-Machine Co. *v.* Lincoln, page 108.
Cahill *v.* Beckford, page 112.
Tillotson *v.* Munson, page 138.
Elizabeth *v.* Pavement Co., page 162.
Gardner *v.* Herz, page 179.
Rubber-Tip Pencil Co. *v.* Howard, page 247.
Albright *v.* The Celluloid Harness-Trimming Co., page 254.
Pitts *v.* Whitman, page 313.
Pitts *v.* Wemple, page 313.
Union Paper-Collar Co. *v.* Leland, page 339.
Gallahue *v.* Butterfield, page 340.
Irwin *v.* Dane, page 352.
Munson *v.* The Gilbert & Barker Mfg. Co., page 362.
Crane *v.* Price, page 376.

And see, *post*, —

EARLE *v.* SAWYER, page 502.
PERRY *v.* CO-OPERATIVE FOUNDRY CO., page 521.
PALMERBING *v.* BUCHOLZ, page 522.
HINKS *v.* SAFETY LIGHTING CO., page 525.

CHAPTER VI.

SUBSTITUTION.

141. CASES of substitution are closely connected with those of combination and with those of new use. In fact, it is often hard to say under which head a particular case should be classed.[1] In the main, however, a practical distinction has been made between the three subjects, and we therefore devote a chapter to the topic Substitution, as well as to New Use and to Combination.

142. In the first place, the same remark that was made in regard both to new use and to combination is applicable here. Invention may be shown only in the device or devices by which a particular substitution is effected. Such improvements are very rare. Their patentability depends neither on the novelty, in its new situation, of the thing substituted, nor on a new effect produced by the substitution, but simply on the device or devices by means of which the thing substituted is adapted to its new situation. These cases, therefore, are not properly cases of substitution, and we shall not include them in the remarks which follow.

143. It is true also, of course, that the substitution of a newly discovered substance, or of a substance or article of any sort in which a new property has been discovered, is always patentable.

144. One important branch of this subject — the substitution of equivalents — has already been discussed in the first chapter of this book.[2]

145. There are but few cases which, strictly speaking, are cases of substitution; but among them, it so happens, are three of the most important and most noted decisions made by the Supreme Court in regard to the patent law. These are Hotch-

[1] Some attempt at a basis of classification is made in a foot-note to page 281, *ante*.

[2] *Vide* page 63.

kiss *v.* Greenwood,[1] Hicks *v.* Kelsey,[2] and Smith *v.* The Goodyear Dental Vulcanite Co.[3] We will state them very briefly.[4]

146. In the case of Hotchkiss *v.* Greenwood the patent was for an improvement in door-knobs, which consisted in substituting porcelain for the other materials previously used in connection with a certain kind of shank. It appeared (1) that a porcelain door-knob had been used with other kinds of shanks,[5] (2) that it was no better adapted to this kind of shank than the other knobs, (3) that nothing more than mechanical skill was required to unite it to the shank. But, on the whole, the new knob was better and cheaper than any in use before. The improvement, however, was held not patentable, inasmuch as it was the mere substitution of one material for another. No ingenuity was required to unite the knob and shank, and no new function or effect resulted from their union.

147. In the second case, Hicks *v.* Kelsey, the patent related to a wagon-reach, *i. e.* the pole connecting the fore and hind axles of a wagon. This was curved upward from the hind axle, so as to allow the fore-wheels to pass under it when the wagon was turned around.

The reach was made of wood throughout, strengthened by straps of iron attached to each side of it. The patentee's improvement consisted in leaving out the wood in the curved part, and bolting or welding together the iron straps in that part of the reach. There was evidence that the new reach was less bulky, and stronger than the old one, — stronger, because by the use of iron alone in the curved part the loosening of the bolts there, caused by contraction of the wood in summer, was avoided.

This improvement was held to be not patentable. The court (Bradley, J.) said: —

" . . . The use of one material instead of another in constructing a known machine is in most cases so obviously a matter of mere mechanical judgment and not of invention, that it cannot be called an invention, unless some new and useful result, an increase of efficiency, or a decided saving in the operation, is clearly attained. Some evidence

[1] 11 How. 248.

[2] 18 Wall. 670.

[3] 93 U. S. 486.

[4] Full abstracts of them will be found *post*. See pages 504, 508, 510.

[5] The case is always considered as including this fact. But a careful reading of the reports, more especially of the Circuit Court report (4 McLean, 456), gives some reason to think that the patentee was the first to make a knob of porcelain.

was given to show that the wagon-reach of the plaintiff is a better reach, requiring less repair and having greater solidity than the wooden reach. But it is not sufficient to bring the case out of the category of more or less excellence of construction. The machine is the same."

148. In the third case, Smith *v.* The Goodyear Dental Vulcanite Co., the improvement was in the manufacture of false teeth, and it consisted in substituting a plate made of vulcanizable compound for the cement or other materials previously used. The great *desideratum* in this manufacture was an unbroken connection between the plate and teeth, so that there should be no crevices in which food could lodge. This had not been effected by the other materials, but it was effected by the plate of vulcanizable compound united with the teeth in the manner described. The method of union was construed by the court as an essential part of the invention.

The claim was: —

"The plate of hard rubber or vulcanite, or its equivalent, for holding artificial teeth, or teeth and gums, substantially as described."

149. The court held the invention to be

"a set of artificial teeth, as a new article of manufacture, consisting of a plate of hard rubber with teeth, or teeth and gums, secured thereto in the manner described in the specification, by embedding the teeth and pins in a vulcanizable compound, so that it shall surround them, while it is in a soft state, before it is vulcanized, and so that, when it has been vulcanized, the teeth are firmly and inseparably secured in the vulcanite, and a tight joint is effected between them, the whole constituting but one piece. . . . The invention, then, is a product or manufacture made in a defined manner. It is not a product alone, separated from the process by which it is created."

150. And in a later suit [1] upon the same patent, a case of infringement only, the court said: —

"The process detailed in the description antecedent to the claim, and referred to thereby, is as much a part of the invention as are the materials of which the plate or product is composed. Both are necessary elements of it. Hence to constitute an infringement of the patent, both the material of which the dental plate is made, or its equivalent, and the process of constructing the plate, or a process equivalent thereto, must be employed."

[1] Goodyear Den. Vul. Co. *v.* Davis, 102 U. S. 222.

151. It appears, then, that in this case there was something more than substitution. The improvement amounted to the creation of a new article. Its chief value lay in the manner by which the substitution was effected. It is true that it is impossible, in this case, entirely to separate the thing substituted from the manner of the substitution, because the *plastic* state of the article substituted, at the time of the substitution, is at once a part of the process of substitution and of the thing substituted.

152. It is plain, however, that the case would have been very different had cold india-rubber, in some form, been substituted in the ordinary manner for the materials previously used. In that case, we may suppose, there would have been a decided gain, in lightness and in cheapness, although the new effect of an unbroken connection would not have been obtained. Would this substitution, or would some similar one which the reader may imagine, be patentable?

153. In considering this question, we have first to examine the doctrine laid down in the three decisions of the Supreme Court, which we have stated. It was summed up, in the last of them, by Strong, J., as follows: —

"The case [Hotchkiss *v.* Greenwood] does decide that employing one known material in place of another is not invention, if the result be only greater cheapness and durability of the product. But this is all. It does not decide that no use of one material in lieu of another in the formation of a manufacture can in any case amount to invention, or be the subject of a patent. If such a substitution involves a new mode of construction, or develops new uses and properties of the article formed, it may amount to invention. The substitution may be something more than formal. It may require contrivance, in which case the mode of making it would be patentable; or the result may be the production of an analogous but substantially different manufacture. This was intimated very clearly in the case of Hicks *v.* Kelsey (18 Wall. 670), where it was said: 'The use of one material instead of another in constructing a known machine is in most cases so obviously a matter of mere mechanical judgment, and not of invention, that it cannot be called an invention unless some new and useful result, as increase of efficiency or a decided saving in the operation, be obtained.' But where there is some such new and useful result, where a machine has acquired new functions and useful properties, it may be patentable as an invention, though the only change made in the machine has been supplanting one of its materials by another. This is true of all com-

binations, whether they be of materials or processes. In Crane *v.* Price[1] (1 Web. Pat. Cas. 393), where the whole invention consisted in the substitution of anthracite for bituminous coal in combination with a hot-air blast for smelting iron-ore, a patent for it was sustained. The doctrine asserted was that, if the result of the substitution was a new, a better, or a cheaper article, the introduction of the substituted material into an old process was patentable as an invention. This case has been doubted, but it has not been overruled; and the doubts have arisen from the uncertainty whether any new result was obtained by the use of anthracite. In Kneass *v.* Schuylkill Bank the use of steel plates instead of copper for engraving was held patentable.[2] So has been the flame of gas, instead of the flame of oil, to finish cloth. These cases rest on the fact that a superior product has been the result of the substitution, — a product that has new capabilities and performs new functions. So in the present case the use, in the manner described, of hard rubber in lieu of the materials previously used for a plate, produced a manufacture long sought but never before obtained," &c.

154. The remarks we have quoted begin with the assertion that the case of Hotchkiss *v.* Greenwood decides that "employing one known material in place of another is not invention, if the result be only greater cheapness and durability of the product." If the gain is only in cheapness or in durability, the article substituted, when you have got it, and so long as it lasts, is practically the same as the article displaced. The facts that you got it cheaper and that it will last longer do not make it a different article.

The proposition quoted, therefore, amounts to saying that there is no invention when the article substituted introduces no new qualities, or produces no new function or effect. This rule, therefore, would not *necessarily* exclude from patentability the substitution of india-rubber in the case which we have supposed, where the article substituted would be different from that displaced by being lighter; and so, of course, if it were different in any other beneficial way. In such a case, we conceive, the substitution would be patentable or not, accordingly as the article substituted was or was not analogous to that displaced.

155. We think, however, that we may go further than this, and say, in spite of the *dictum* above cited from the case of Hotchkiss *v.* Greenwood, that even when the substituted article

[1] *Vide* page 376, *ante*.

[2] But *vide ante*, page 235.

is better than the article displaced only by being cheaper or more durable, invention is not necessarily excluded. Cases of substitution might arise in which the gain in cheapness or in durability was so great as to render practical and valuable a contrivance which before had been little more than a curiosity. And, in fact, barring the proposition we have been discussing, the language of the rest of the quotation would include such a contingency. Thus Strong, J., said, as we have seen: "The substitution may be something more than formal; . . . the result may be the production of an analogous but substantially different manufacture." And in speaking with approval of Crane *v.* Price, he said: "The doctrine asserted was that, if the result of the substitution was a new or a better or a cheaper article, the introduction of the substituted material into an old process was patentable as an invention."

156. In fact, one such case as we suppose has actually arisen. We refer to that of Dalton *v.* Nelson,[1] where the patentee had substituted vulcanized rubber in the opposing surfaces of steam-gauge cocks for brass, lead, leather, and cork, — all of which had been used before, separately. The advantage of the rubber was its very superior durability. In sustaining the patent, Shipman, J., said: —

"The result which [the patentee] attained was the invention of a durable gauge cock, which remained tight under various pressures and different degrees of heat, and which did not get out of repair. This result was accomplished by the discovery of the fact that highly vulcanized rubber, in consequence of its elasticity, would not be ground or abraded by water containing dirt or grit, and, in consequence of its durability and non-corrodible properties, would successfully endure and withstand the power of steam. In the year 1853 [date of the invention] the peculiar adaptability of hard rubber to the varied mechanical purposes to which it has since been applied was much less understood than it is at the present time."

157. On the whole, then, we conclude that the language of the Supreme Court, in the cases which we have stated, is rather descriptive than definitive. It is very difficult to lay down a rule which will fit all cases of substitution.

158. We may, however, carry our analysis of these decisions a

[1] 13 Blatch. 357.

little further. In cases of substitution, two things are to be considered, — the thing substituted, and the contrivance in which substitution is made.[1] Invention may be shown with regard to either. One form of substitution consists in substituting something which does not introduce any new function, any new idea, in short, but which is cheaper or more durable, or has some other comparative advantage over the element displaced. This form of substitution is patentable, as we have seen, when, and only when, the patentee has been the first to discover the capability in the thing substituted, which makes it valuable in the new situation; or else has been the first to conceive the idea of transferring the thing substituted from some non-analogous situation. These cases are rare, and they do not present much difficulty. An instance we have already given, namely, the case of Dalton *v.* Nelson, where the substitution was patentable because, as Shipman, J., said, the patentee had discovered the capability which he employed in the article that he substituted. In the door-knob case, on the other hand, it was matter of common knowledge that the porcelain door-knob had the same qualities as the other knobs that had been used; and so in the case of Hicks *v.* Kelsey, the properties of iron which the patentee made use of in his substitution of it were well known.

The other and more common form of substitution occurs when, by means of the substitution, a new function, a new idea, in fact, is introduced into the original contrivance. This was the case in Smith *v.* Goodyear Dent. Vul. Co., where, as we have seen, a new function or effect was developed by the peculiar manner in which the teeth and the substituted plate united. What, then, is a new function or effect?

159. This leads us a little further to a distinction which, though not suggested by the Supreme Court, is, we think, deducible from their decisions as well as from the nature of the subject. It may be stated thus: A new function or effect is produced by the substitution, when a new interaction is brought about between the element substituted and the other elements of the contrivance, or some one thereof. The matter would then stand thus: —

(1.) If the superiority of the thing substituted is unconnected

[1] *Vide* sect. 142, *ante*, page 493.

with any other element in the article, as that it is merely cheaper or more durable, — invention is excluded, — unless, as we have already said, there was discovery or invention exercised by the patentee in finding out that the thing substituted had the capabilities on account of which he substituted it, or in transferring it from some non-analogous situation.

(2.) If the superiority of the thing substituted lies in its greater adaptability to some other element of the contrivance, whereby that other element acts in a different way from what it did before, then there is at least a presumption of invention.

160. The Dental Vulcanite case is an illustration of this last proposition. The substitution of the plate of vulcanizable compound was held patentable because it produced a new interaction between itself and the teeth. It would not have been patentable — at least so much seems to be implied by the opinion of the court — if no such new interaction had been produced.

161. At any rate, if the rubber plate had been superior only in its lightness, cheapness, and freedom from decay, the substitution of it would not have been patentable, unless the patentee had been in some sense the discoverer of those qualities. So in the door-knob case, the substitution of the better knob was held not patentable; but the court intimated that if the knob had grasped, so to say, the shank in a way different from that of other knobs, the substitution would have been patentable.

162. We hesitate to say that there is invention whenever such interaction as we describe is produced; but certainly when it exists, there is a presumption of invention; and the converse of the proposition is true. That is, if such interaction as we describe is not produced by the substitution, invention is excluded, unless, as has been said, the capability of the thing substituted is the discovery or the invention of the patentee. We mean that he must either have discovered the physical existence of such capability, or else have transferred the thing substituted from a situation or use so non-analogous to that in which he puts it, that invention was required to make the transfer.[1]

163. The reason for these rules is apparent. If the conditions

[1] Here we touch upon the subject of new use. *Vide ante*, page 281 *et seq.*

just stated are not fulfilled, then the patentee has imported nothing new into the old contrivance. He has merely put in the place of one article another, commonly known as an equivalent for it.[1]

164. In the case of Hicks *v.* Kelsey, the improvement caused by the substitution seems to have been slight.

Bradley, J., said: —

"Some evidence was given to show that the wagon-reach of the plaintiff is a better reach, requiring less repair and having greater solidity than the wooden reach; but it is not sufficient to bring the case out of the category of more or less excellence of construction. The machine is the same."

165. It is also to be remarked that this case, though treated by the court as one of substitution, scarcely was such. Nothing was substituted, but something was left out, namely, the wood in the curved part of the reach, and nothing was put in its place. As the reader will remember, the improvement consisted in leaving out the wood, which had been bound on each side by straps of iron, and in bolting or welding the iron straps directly together. It is not even intimated that the iron straps were made larger or different in any way to make up for the loss of the wood. The chief advantage was, as we have said, that there was no contraction of the iron reach, and consequent loosening of the bolts, as was the case in the reach made of wood and iron.

166. Whether this advantage arose from a new interaction or not is a nice question. We shall do no more than to state it. On the one hand, it might be said: The difference between the new article and the old was not merely the difference between wood and iron considered in themselves, but there was also the difference arising from their diverse action in conjunction with bolts. This difference was not the primary, but the secondary, result of the use of iron alone, instead of wood and iron. So far as there was substitution only, the new article was lighter and smaller, and therefore better, than the old, but not therefore patentable; because these improvements resulted directly from the change of material; but the chief improvement, the permanent solidity of the wagon-reach, resulted from the interaction of

[1] *Vide ante*, page 83.

the substituted material and bolts, which was different from the interaction of the old material and bolts. In respect of this improvement, wood was as good as iron, had there been no bolts.

167. In reply, it might be urged that the difference was one of degree, not of kind. Really, there was no interaction at all, for the bolts remained the same, whether used with wood or with iron. The difference resided in the wood and iron alone; and it does not alter the case that the defect of the wood was called out by another element in the article itself, and not by some force external to the article.

EARLE *v.* SAWYER, 4 MAS. 1.

D. OF MASS., 1825. STORY, J.

This was a motion for a new trial.

The patent was for an improvement in a machine for making shingles, and it consisted in substituting a circular for the perpendicular saw.

Small circular saws had previously been used for veneering and sawing picture-frames. There was evidence that an ordinary mechanic could hardly have failed to effect the substitution, had it been suggested to him, in the way that the plaintiff effected it; and there was counter-evidence of the difficulties which the plaintiff, himself an ingenious mechanic, had met with in adapting the circular saw to the machine. There is no description of the apparatus in the report of the case.

The defence was want of ingenuity.

Story, J.:—

" . . . The whole argument is, if I rightly comprehend it, to this effect. It is not sufficient that a thing is new and useful to entitle the author of it to a patent. He must do more. He must find it out by mental labor and intellectual creation. If the result of accident, it must be what would not occur to all persons skilled in the art who wished to produce the same result. There must be some addition to the common stock of knowledge, and not merely the first use of what was known before. The Patent Act gives a reward for the communication of that which might otherwise be withholden. An invention is the

finding out by some effort of the understanding. The mere putting of two things together, although never done before, is no invention.[1]

"It did not appear to me at the trial, and does not appear to me now, that this mode of reasoning upon the metaphysical nature, or the abstract definition of an invention, can justly be applied to cases under the Patent Act. That act proceeds upon the language of common sense and common life, and has nothing mysterious or equivocal in it.

"The thing to be patented is not a mere elementary principle or intellectual discovery, but a principle put in practice, and applied to some art, machine, manufacture, or composition of matter. It must be *new*, and not *known* or *used* before the application; that is, the party must have found out, created, or constructed some art, machine, &c., or improvement on some art, machine, &c., which had not been previously found out, created, or constructed by any other person."

After quoting from the act of 1793, ch. 11, § 1:—

"It is of no consequence whether the thing be simple or complicated; whether it be by accident or long, laborious thought, or by an instantaneous flash of mind, that it is first done.[2] . . . It must also be useful, that is, it must not be noxious or mischievous, but capable of being applied to good purposes; and perhaps it may also be a just interpretation of the law that it meant to exclude things absolutely frivolous and foolish. . . . The first question, then, to be asked in cases of this nature is whether the thing has been done before. In case of a machine, whether it has been substantially constructed before; in case of an improvement of a machine, whether that improvement has ever been applied to such a machine before, or whether it is substantially a new combination. If it is *new*, if it is *useful*, if it has *not been known* or *used* before, it constitutes an invention within the very terms of the act,

[1] This is an exact statement of the law, and each sentence in it might be substantiated by quotations from decided cases.

If Judge Story's construction of the law were the right one, every new article of trade or manufacture would be patentable.

The reader will observe that further in his remarks upon the language of the statute he makes no reference to the words "invented or discovered," and his conclusion is based upon the assumption that all the statute requires is that the thing to be patented shall be new and useful.

The words "invented or discovered" are, however, found in the statute, and "the language of common sense and common life" has given them a meaning. The truth probably is that, in Judge Story's mind, the word "new" really stood for the very quality of invention, which he reprobated. In fact, he so defines it *infra*, where he says that a thing to be *new* must be "*found out*, *created*, or *constructed*," *i. e.* discovered or invented.

[2] *Vide ante*, pages 20–20.

and, in my judgment, within the very sense and intendment of the legislature. I am utterly at a loss to give any other interpretation of the act; and indeed in the very attempt to make that more clear, which is expressed in unambiguous terms in the law itself, there is danger of creating an artificial obscurity.

"With these views, I did not hesitate to tell the jury at the trial that the true question for them to decide was whether the improvement secured by the patent had ever been thought of or applied to the original machine by any other person before the plaintiff conceived and executed the combination."

HOTCHKISS *v.* GREENWOOD, 11 How. 248 (1850).

The patent was for making door and other knobs out of potters'-clay and porcelain, and attaching the knob so made to a metal shank or spindle by

"having the cavity in which the screw or shank is inserted, by which they [the knobs] are fastened, largest at the bottom of its depth, in form of a dovetail, and a screw formed therein, by pouring in metal in a fused state."

The patent claimed: —

"The manufacturing of knobs, as stated in the foregoing specifications, of potters'-clay, or any kind of clay used in pottery, and shaped and finished by moulding, turning, burning, and glazing; and also of porcelain."

Door-knobs of clay or porcelain were old; this device for attaching door-knobs was old in connection with knobs of brass, &c.; and the court held that the new use of the old knob in connection with the old device did not constitute a patentable invention, although the result, the new door-handle, might be better and cheaper than any before made. It did not appear at this trial that the device described was more easily applied to a clay or porcelain knob, or more effective when so applied; but only that the new door-handle was better and cheaper than any in use before it.

At the trial below,[1] the counsel for the plaintiffs asked the

[1] 4 McLean, 456.

court to instruct the jury that although both knob and spindle were old taken separately, yet,

"if such shank and spindle had never before been attached to potters'-clay or porcelain, and if it required skill and thought and invention to attach the said knob of clay to the metal shank and spindle, so that the same would unite firmly and make a solid and substantial article of manufacture, and if the said knob of clay or porcelain so attached were an article better and cheaper than the knob theretofore manufactured of metal or other materials, that the patent was valid."

The court refused to do so; remarking upon the expression "skill, thought, and invention," in the first clause of the instruction prayed for, that it was misleading, because the skill and thought of a mechanic were required to attach a spindle to any kind of knob; and these two requisites being granted, the jury might from them erroneously infer the third, — invention, "the hinge of the case;" and, upon the second clause, that "cheapness" and "quality" of the article produced "afford no ground whatever for a patent."

The instructions actually given were: —

"If knobs of the same form and for the same purposes with that described by the plaintiffs in their specifications, made of metal or other material, had been known and used in the United States prior to the alleged invention and patent of the plaintiffs; and if the spindle and shank in the form used by the plaintiffs had before that time been publicly known and used in the United States, and had been theretofore attached to metallic knobs by means of the dovetail and the infusions of melted metal, as the same is directed in the specifications of the plaintiffs to be attached to the knob of potters'-clay or porcelain, so that if the knob of clay or porcelain is the mere substitution of one material for another, and the spindle and shank be such as were theretofore in common use, and the mode of connecting them to the knob by dovetail be the same that was theretofore in use in the United States, the material being in common use, and no other ingenuity or skill being necessary to construct the knob than that of an ordinary mechanic acquainted with the business, the patent is void, and the plaintiffs are not entitled to recover."

Judgment for the defendants. The case was carried up by writ of error to the Supreme Court, where the judgment was affirmed, Woodbury, J., dissenting.

Nelson, J., delivered the opinion of the court as follows: —

". . . The instruction assumes, and, as was admitted on the argument, properly assumes, that knobs of metal, wood, &c., connected with a shank and spindle, in the mode and by the means used by the patentees in their manufacture, had been before known, and were in public use at the date of the patent, and hence the only novelty which could be claimed on their part was the adaptation of this old contrivance to knobs of potters'-clay or porcelain; in other words, the novelty consisted in the substitution of the clay knob in the place of one made of metal or wood, as the case might be. And in order to appreciate still more clearly the extent of the novelty claimed, it is proper to add that this knob of potters'-clay is not new, and therefore constitutes no part of the discovery. If it was, a very different question would arise; as it might very well be urged, and successfully urged, that a knob of a new composition of matter, to which this old contrivance had been applied, and which resulted in a new and useful article, was the proper subject of a patent.

"The novelty would consist in the new composition made practically useful for the purposes of life by the means and contrivances mentioned. It would be a new manufacture; and none the less so, within the meaning of the patent law, because the means employed to adapt the new composition to a useful purpose was old or well known.

"But in the case before us the knob is not new, nor the metallic shank and spindle, nor the dovetail form of the cavity in the knob, nor the means by which the metallic shank is securely fastened therein. All these were well known and in common use, and the only thing new is the substitution of a knob of a different material from that heretofore used in connection with this arrangement.

"Now, it may very well be that, by connecting the clay or porcelain knob with the metallic shank in this well-known mode, an article is produced better and cheaper than in the case of the metallic or wood knob; but this does not result from any new mechanical device or contrivance, but from the fact that the material of which the knob is composed happens to be better adapted to the purpose for which it is made. The improvement consists in the superiority of the material, and which is not new, over that previously employed in making the knob.

"But this of itself can never be the subject of a patent. No one will pretend that a machine made, in whole or in part, of materials better adapted to the purpose for which it is used than the materials of which the old one is constructed, and for that reason better and cheaper, can be distinguished from the old one, or, in the sense of the patent law, can entitle the manufacturer to a patent.

"The difference is formal, and destitute of ingenuity or invention. It may afford evidence of judgment and skill in the selection and adaptation of the materials in the manufacture of the instrument for the purposes intended, but nothing more.

"I remember having tried an action in the circuit in the district of Connecticut some years since, brought upon a patent for an improvement in manufacturing buttons.

"The foundation of the button was wood, and the improvement consisted in covering the face with tin, and which was bent over the rim so as to be firmly secured to the wood. . . .

"On the trial the defendant produced a button taken off a coat on which it had been worn before the Revolution, made precisely in the same way, except the foundation was bone. The case was given up on the part of the plaintiff.

"'Now the new article was better and cheaper than the old one; but I did not then suppose, nor do I now, that this could make any difference, unless it was the result of some new contrivance or arrangement in the manufacture. Certainly it could not, for the reason that the materials with which it was made were of a superior quality, or better adapted to the uses to which the article is applied.

"'It seemed to be supposed on the argument that this mode of fastening the shank to the clay knob produced a new and peculiar effect upon the article, beyond that produced when applied to the metallic knob, inasmuch as the fused metal by which the shank was fastened to the knob prevented the shank from acting immediately upon the knob, it being enclosed and firmly held by the metal; that for this reason the clay or porcelain knob was not so liable to crack or be broken, but was made firm, and strong, and more durable. This is doubtless true. But the peculiar effect thus referred to is not distinguishable from that which would exist in the case of the wood knob, or one of bone or ivory, or of other materials that might be mentioned.'

"Now, if the foregoing view of the improvement claimed in this patent be correct, it is quite apparent that there was no error in the submission of the questions presented at the trial to the jury; for, unless more ingenuity and skill in applying the old method of fastening the shank and the knob were required in the application of it to the clay or porcelain knob than were possessed by an ordinary mechanic acquainted with the business, there was an absence of that degree of skill and ingenuity which constitute essential elements of every invention. In other words, the improvement is the work of the skilful mechanic, not that of the inventor."

Woodbury, J., dissenting, said: —

" . . . Now, on the point as to the invention being patentable, the direction virtually was to consider it not so, if an ordinary mechanic could have made or devised it; whereas, in my view, the true test of its being patentable was, if the invention was new, and better and cheaper than what preceded it. This test, adopted by the Circuit Court, is one sometimes used to decide whether the invention for which a patent has been obtained is new enough or distinguished enough from a former invention to prevent it from being an infringement, and to justify a new patent for it, and not, as here, whether it is valuable or material enough *per se* to be protected by any patent.

" Whenever the kind of test adopted below is used otherwise than to see if there has been an infringement or not, it is to ascertain whether the invention is original or not; that is, whether it is a trifling change, and merely colorable, or not. Webster on Sub. Mat. 25; Curtis on Patents, 6, 7; 2 Gallis. C. C. 51; 1 Mason C. C. 182. But it is impossible for an invention to be merely colorable, if, as claimed here, it was better and cheaper; and hence this last criterion should, as requested by the plaintiffs, have been suggested as a guide to the jury. . . . The skill necessary to construct it, on which both the court below and the court here rely, is an immaterial inquiry, or it is entirely subordinate to the question whether the invention was not cheaper and better. Thus, some valuable discoveries are accidental rather than the result of much ingenuity, and some happy ones are made without the exercise of great skill, which are still in themselves both novel and useful. Such are entitled to protection by a patent, because they improve or increase the power, convenience, and wealth of the community." [1]

HICKS *v.* KELSEY, 18 WALL. 670 (1873).

A patent for an improved wagon-reach, *i. e.* the pole connecting the front and hind axles of wagons. A wagon-reach curves upward, in its middle part, so as to allow the front wheels to turn under it. Before the plaintiff's alleged invention it was made of wood throughout, strengthened by straps of iron attached to each side of it. The plaintiff's improvement consisted in leaving out the wood *in the curve*, and bolting or welding the iron straps together in that part of the reach.

[1] We quote these remarks for their historical interest.

There was evidence that the new reach was less bulky and stronger than the old, — stronger, because by the use of iron alone in the curved part the loosening of the bolts there, caused by contraction of the wood in summer, was avoided.

Bradley, J., delivered the opinion of the court as follows: —

"The question is, whether the mere change of material — making the curve of iron instead of wood and iron — was a sufficient change to constitute invention; the purpose being the same, the means of accomplishing it being the same, and the form of the reach and mode of operation being the same.

"It is certainly difficult to bring the case within any recognized rule of novelty by which the patent can be sustained. The use of one material instead of another in constructing a known machine is in most cases so obviously a matter of mere mechanical judgment, and not of invention, that it cannot be called an invention unless some new and useful result — an increase of efficiency or a decided saving in the operation — is clearly attained.

"Some evidence was given to show that the wagon-reach of the plaintiff is a better reach, requiring less repair and having greater solidity than the wooden reach. But it is not sufficient to bring the case out of the category of more or less excellence of construction. The machine is the same. Axe-helves made of hickory may be more durable and more cheap in the end than those made of beech or pine, but the first application of hickory to the purpose would not be therefore patentable.

"Cases have frequently arisen in which substantially the question now presented has been discussed. Perhaps, however, none can be cited more directly in point than that of Hotchkiss *v.* Greenwood (11 How. 248), in which it was held that the substitution of porcelain for metal in making door-knobs of a particular construction was not patentable, though the new material was better adapted to the purpose and made a better and cheaper knob, having been used for door-knobs, however, before. So, in a case at the circuit, referred to by Judge Nelson in the last-named case, the substitution of wood for bone as the basis of a button covered with tin was held not patentable.

"In Crane *v.* Price[1] (Webster's Patent Cases, 409), it is true, the use of anthracite instead of bituminous coal with the hot blast in smelting iron-ore was held to be a good invention, inasmuch as it produced a better article of iron at a less expense. But that was a process of

[1] *Vide ante*, page 376.

manufacture, and in such processes a different article replacing another article in the combination often produces different results. The latter case is more analogous to the cases of compositions of matter than it is to those of machinery; and in compositions of matter a different ingredient changes the identity of the compound, whereas an iron bar in place of a wooden one, and subserving the same purpose, does not change the identity of a machine.[1] Curtis on Patents (3d ed.), 70–73.

"But the plaintiff's counsel alleges that his invention does not consist of the mere substitution of a particular material for another material which had been previously used for the same purpose in the same way, but consists in the production of a certain described article by a certain described mechanical process, which process, viewed as a whole, is new and useful. And then he describes what he supposes to be such new mechanical process.

"This is his argument; but the facts do not bear out such a view of the case. In our judgment, the patent in this case is void for want of novelty in the alleged invention."

SMITH *v.* GOODYEAR DENTAL VULCANITE CO., 93 U. S. 486 (1876).

Reissue No. 1904, dated March 21, 1865, of a patent originally granted to John A. Cummings, June 7, 1864, for an improvement in the manufacture of artificial teeth.

The court quoted from the able opinion of the circuit judge[2] a description of the invention, as follows:—

"The making of a vulcanite dental plate out of a vulcanizable rubber compound into which the teeth were embedded in its plastic condition, and the rubber compound, with the teeth thus embedded in it, afterwards vulcanized by heat, so that the teeth, gums, and plate should be perfectly joined, without any intervening crevices, and the plate should possess the qualities of hard rubber or vulcanite."

The claim was:—

"The plate of hard rubber or vulcanite, or its equivalent, for holding artificial teeth, or teeth and gums, substantially as described."

The chief advantage of the invention was that it obviated, in the manner above described, the crevices which existed in all

[1] *Vide ante*, page 66.

[2] Shepley, J., 1 Holmes, 354.

other arrangements of artificial teeth, forming receptacles for particles of food. The india-rubber plate was also more yielding to the mouth, much lighter, and much less expensive than any in use before it. Possessing these advantages, it entirely superseded all other plates.

The defendants alleged that this valuable improvement was merely the substitution of one material for another, and therefore, under the rule established by the case of Hotchkiss *v.* Greenwood, not patentable.

Strong, J.: —

" . . . We proceed to examine the several defences set up. Among these the one perhaps most earnestly urged is the averment that the device described in the specification was not a patentable invention, but that it was a mere substitution of vulcanite for other materials, which had previously been employed as a base for artificial sets of teeth, — a change of one material for another in the formation of a product. If this is in truth all that the thing described and patented was, if the device was merely the employment of hard rubber for the same use, in substantially the same manner and with the same effect that other substances had been used for in the manufacture of the same articles, it may be conceded that it constituted no invention. So much is decided in Hotchkiss *v.* Greenwood, 11 How. 248. But such is not our understanding of the device described and claimed. In the specification it is declared that the invention 'consists in forming the plate to which the teeth, or teeth and gums, are attached, of hard rubber, or vulcanite, so called, an elastic material, possessing and retaining in use sufficient rigidity for the purpose of mastication, and at the same time being pliable enough to yield a little to the motions of the mouth.' This is immediately followed by a description of the manner of the proposed use; that is, of making the hard rubber plates: and the claim, as stated, is 'the plate of hard rubber, or vulcanite, or its equivalent, for holding artificial teeth, or teeth and gums, substantially as described;' that is, plainly, formed as described. The invention, then, is a product or manufacture made in a defined manner. It is not a product alone separated from the process by which it is created. The claim refers in terms to the antecedent description, without which it cannot be understood. The process detailed is thereby made as much a part of the invention as are the materials of which the product is composed. We shall not quote at large the description of the mode of making the plate. Such a quotation would unnecessarily prolong this opinion. It plainly shows a purpose of the inventor to secure what had not been secured

before, — a combination of a plate with artificial teeth, or with gums and teeth, in such a manner as to be free from the objections and defects or inconveniences attending the method before practised of attaching such teeth to a metallic plate fitted to the roof of the mouth. Some of these objections are stated; such as expense, hurting the mouth, impeding mastication, and obstruction to perfect articulation. In carrying out the purpose proposed, the materials employed were all old. The teeth, the wax, the plaster, the moulds, the soft rubber, and the hard rubber, were none of them new. It is also true that the steps in the process were not all new. Plaster had been used for formation of moulds. The process of forming a plate by the use of such moulds was well known, and so was the process of converting a vulcanizable compound into vulcanite by heating it and allowing it to cool in moulds. But the process of Dr. Cummings extended beyond the use of known materials and the employment of the processes mentioned. It was vulcanizing soft rubber in a mould, and in contact with artificial teeth inserted in place into it while it remained in a soft condition. It was well described by the circuit judge as 'the making of a vulcanite dental plate out of a vulcanizable compound, into which the teeth were embedded in its plastic condition, and the rubber compound, with the teeth thus embedded in it, afterwards vulcanized by heat, so that the teeth, gums, and plate should be perfectly joined without any intervening crevices, and the plate should possess the quality of hard rubber or vulcanite.' The combination thus resulted in a manufacture which was 'one piece.'

"If, then, the claim be read, as it should be, in connection with the preceding part of the specification, and construed in the light of the explanation which that gives, the invention claimed and patented is 'a set of artificial teeth as a new article of manufacture, consisting of a plate of hard rubber, with teeth, or teeth and gums, secured thereto in the manner described in the specification, by embedding the teeth and pins in a vulcanizable compound, so that it shall surround them while it is in a soft state, before it is vulcanized, and so that when it has been vulcanized the teeth are firmly and inseparably secured in the vulcanite, and a tight joint is effected between them, the whole constituting but one piece.' It is evident this is much more than employing hard rubber to perform the functions that had been performed by other materials, such as gold, silver, tin, platinum, or gutta-percha. A new product was the result, differing from all that had preceded it, not merely in degree of usefulness and excellence, but differing in kind, having new uses and properties. It was capable of being perfectly fitted to the roof and alveolar processes of the mouth. It was easy for the wearer, and favorable for perfect articulation. It was light and

elastic, yet sufficiently strong and firm for the purposes of mastication. The teeth, gums, and plate constituting one piece only, there were no crevices between the teeth and their supporters into which food could gather, and where it could become offensive, and there could be no such crevices so long as the articles lasted. They were unaffected by any chemical action of the fluids of the mouth. Besides all this, they were very inexpensive as compared with other arrangements of artificial teeth.

"To us it seems not too much to say that all these peculiarities are sufficient to warrant the conclusion that the device was different in kind or species from all other devices. We cannot resist the conviction that devising and forming such a manufacture by such a process and of such materials was invention. More was needed for it than simple mechanical judgment and good taste. Were it not so, hard rubber would doubtless have been used in the construction of artificial sets of teeth, gums, and plates long before Cummings applied for his patent. To find a material, with a mode of using it, capable of being combined with the teeth in such a manner as to be free from the admitted faults of all other known combinations, had been an object long and earnestly sought. It had been a subject for frequent discussions among dentists and in scientific journals. The properties of vulcanite were well known; but how to make use of them for artificial sets of teeth remained undiscovered, and apparently undiscoverable, until Cummings revealed the mode. But when revealed its value was soon recognized, and no one seems to have doubted that the resulting manufacture was a new and most valuable invention. The eminent dentists and experts examined in this case uniformly speak of it as such. Not one has ventured to testify that it was not an invention. They speak of it as 'a novel and desirable thing;' as 'the greatest improvement in dentistry' made in many years; and as an invention which is 'a great benefaction to mankind, whereby both health and comfort are promoted.' The evidence also shows that it has wrought a revolution in dental practice, and that many thousands of operators are using it in preference to older devices. All this is sufficient, we think, to justify the inference that what Cummings accomplished was more than a substitution of one material for another; more than the exercise of mechanical judgment and taste, — that it was, in truth, invention. Undoubtedly, the results or consequences of a process or manufacture may in some cases be regarded as of importance when the inquiry is, whether the process or manufacture exhibits invention, thought, and ingenuity. Webster, on the subject-matter of patents, page 30, says: 'The utility of the change, as ascertained by its consequences, is the real practical test of the sufficiency of an invention; and since the one cannot exist without the other, the

existence of the one may be presumed on proof of the existence of the other. Where the utility is proved to exist in any degree, a sufficiency of invention to support the patent must be presumed.' We do not say the single fact that a device has gone into general use, and has displaced other devices which had previously been employed for analogous uses, establishes in all cases that the later device involves a patentable invention. It may, however, always be considered; and, when the other facts in the case leave the question in doubt, it is sufficient to turn the scale.

"We have, therefore, considered this branch of the case without particular reference to Hotchkiss *v.* Greenwood, 11 How. 248. The patent in that case was for an improvement in making door and other knobs for doors, locks, and furniture, and the improvement consisted in making them of clay or porcelain, in the same manner in which knobs of iron, brass, wood, or glass had been previously made. Neither the clay knob nor the described method of attaching it to the shank was novel. The improvement, therefore, was nothing more than the substitution of one material for another in constructing an article. The clay or porcelain door-knob had no properties or functions which other door-knobs made of different materials had not. It was cheaper, and perhaps more durable; but it could be applied to no new use, and it remedied no defects which existed in other knobs. Hence it was ruled that the alleged improvement was not a patentable invention. The case does decide that employing one known material in place of another is not invention, if the result be only greater cheapness and durability of the product. But this is all. It does not decide that no use of one material in lieu of another in the formation of a manufacture can, in any case, amount to invention, or be the subject of a patent. If such a substitution involves a new mode of construction, or develops new uses and properties of the article formed, it may amount to invention. The substitution may be something more than formal. It may require contrivance, in which case the mode of making it would be patentable; or the result may be the production of an analogous but substantially different manufacture. This was intimated very clearly in the case of Hicks *v.* Kelsey, 18 Wall. 670, where it was said, 'The use of one material instead of another in constructing a known machine is, in most cases, so obviously a matter of mere mechanical judgment, and not of invention, that it cannot be called an invention, unless some new and useful result, as increase of efficiency, or a decided saving in the operation, be obtained.' But where there is some such new and useful result, where a machine has acquired new functions and useful properties, it may be patentable as an invention, though the only change made in the machine has been supplanting one of its materials by another. This is

true of all combinations, whether they be of materials or processes. In Crane *v.* Price, 1 Webst. Pat. Cas. 393,[1] where the whole invention consisted in the substitution of anthracite for bituminous coal in combination with a hot-air blast for smelting iron-ore, a patent for it was sustained. The doctrine asserted was, that if the result of the substitution was a new, a better, or a cheaper article, the introduction of the substituted material into an old process was patentable as an invention. This case has been doubted, but it has not been overruled; and the doubts have arisen from the uncertainty whether any new result was obtained by the use of anthracite. In Kneass *v.* Schuylkill Bank,[2] the use of steel plates instead of copper for engraving was held patentable. So has been the flame of gas instead of the flame of oil to finish cloth. These cases rest on the fact that a superior product has been the result of the substitution, — a product that has new capabilities and that performs new functions. So in the present case the use, in the manner described, of hard rubber in lieu of the materials previously used for a plate produced a manufacture long sought but never before obtained, — a set of artificial teeth, light and elastic, easily adapted to the *contour* of the mouth, flexible, yet firm and strong, consisting of one piece, with no crevices between the teeth and the plate, impervious to the fluids of the mouth, unaffected by the chemical action to which artificial teeth and plates are subjected when in place, clean and healthy, — peculiarities which distinguish it from everything that had preceded it. These differences, in our opinion, are too many and too great to be ascribed to mere mechanical skill. They may justly be regarded as the results of inventive effort, and as making the manufacture of which they are attributes a novel thing in kind, and consequently patentable as such.

" A second objection urged by the defendant against the validity of the complainant's patent is alleged want of novelty of the invention; and a strenuous effort has been made to convince us that, although hard rubber had not been used in the manner described for the production of the manufacture, equivalent materials and processes had been, and that a plate substantially the same as that of Dr. Cummings had been made before his improvement. We are not, however, convinced. The patent itself is *prima facie* evidence that the patentee was the first inventor; at least, it casts upon him who denies it the burden of sustaining his denial by proof. We do not find such proof in the case. Though the patent was not granted until June 7, 1864, the invention was completed at least as early as April 12, 1855, when the application for a patent was made. Indeed, as we have noticed, a caveat to protect it was filed on the 14th of May, 1852, which clearly foreshadowed

[1] *Vide ante*, page 376.

[2] *Vide ante*, page 234.

the invention. Yet, taking the spring of 1855 as the time when it was completed, we find nothing in the proofs to justify a conclusion that Dr. Cummings was not the first inventor. It would answer no good purpose to review the voluminous evidence supposed to bear upon this branch of the case. We shall refer only to that which is deemed most important, and which has been most pressed upon us in this argument. Of the English patent of Charles Goodyear it is enough to say that, though the provisional specification was filed March 14, 1855, the completed specification was not until the 11th of September following. It was therefore on the last-mentioned date that the invention was patented.

"The experiments made by George E. Hawes, it must be admitted, closely resembled the process described in the reissued patent to the complainants. He cast in moulds sets of teeth on a tin base, in a manner very like that in which the vulcanite plate is formed by the Cummings process. But the experiments resulted in nothing practical. Hawes cast sets of teeth for the lower jaw only, the weight of the metal making the plate unfit for the upper. In consequence of the shrinkage of the metal in cooling, a tight joint could not be obtained between the teeth and the base. The sets were therefore liable to become offensive in consequence of deposits of food and the secretions of the mouth in the crevices. The shrinkage also prevented a close fitting of the plate to the roof of the mouth, and the tin base was affected by the chemical action of the secretions. In consequence of these and other objections the manufacture was soon abandoned, and it may properly be considered an abandoned experiment. It not only was not the same manufacture as that of Cummings, but it was not suggestive of it; and Dr. Hawes, who cast the tin plates, testifies that the use of vulcanite for dental purposes is the greatest improvement in his profession that he knew of in twenty-five years. He adds, 'that vulcanite may be used by dentists in many ways which could not be accomplished by tin or platinum.' In his opinion, therefore, the cast-tin base was not substantially the same thing as the Cummings manufacture. So also Dr. Royce, who cast plates of tin for artificial teeth in a manner very similar to that of Dr. Hawes, testifies that the solid tin base was found practically unfit for the purpose, except in rare instances. He made but a few sets, — none after 1850, — and adopted the vulcanite, agreeing to pay for a license to use it in manufacturing dental plates.

"We need go no further into a consideration of the various devices and publications offered to show that the manufacture patented was known before Cummings invented it. Suffice it to say, that none of them, in our opinion, suggest or exhibit in substance such a manufacture. The defence of want of novelty is therefore not sustained."

In a subsequent suit upon this patent, Goodyear Dent. Vul. Co. *v.* Davis, 102 U. S. 222, it was held that a plate for false teeth made of celluloid did not infringe it;[1] and the court (by the mouth of Mr. Justice Strong again) made the following remarks: —

"We had occasion, in Smith *v.* Goodyear Dental Vulcanite Company *et al.* (93 U. S. 486), to construe this patent, and determine what the invention claimed and patented really was. We held it to be 'a set of artificial teeth, as a new article of manufacture, consisting of a plate of hard rubber with teeth, or teeth and gums, secured thereto

[1] Upon the question of infringement the court said: "Celluloid is a substance of a comparatively recent discovery. Whether it was known at the time Cummings made his invention, or even at the time when his original patent was granted, we do not care now to inquire. It is sufficient for this case that we consider what it is. It is a compound of vegetable fibre, cellulose, or gun-cotton. Undoubtedly, it can be employed for manufacturing dental plates, and as a base for artificial teeth. Such a plate may have the fineness, lightness, and elasticity of a plate made of hard rubber by the Cummings process; but it is a substance very different from hard rubber, and it is incapable of the same manipulation. It is not vulcanite, and neither it nor its ingredients are capable of being vulcanized. It contains no sulphur or rubber. None of its constituents are vulcanizing agents. Camphor does not perform the function of sulphur. Under the action of heat, its tendency is to soften the compounded mass rather than to harden it, as sulphur does rubber. . . . When employed in manufacturing dental plates, the process is wholly unlike that employed in making hard rubber or vulcanite plates. It is put into a mould, it is true, such as was known and in use before the Cummings invention; but it is put in in a hard state, in its natural condition, and not soft or plastic, and capable of being pressed around the teeth. The mould cannot be closed until heat is applied. When that is applied, the jaws of the mould are gradually screwed together as the celluloid softens; and when the jaws come together the plate is completed. The process requires pressure in addition to heat in order to reduce the plate to shape and compress it around the teeth. There is no heating for hours, as is necessary in the vulcanizing process. The work is done in a few minutes. When allowed to cool, it is the same hard and bony substance it was before its manipulation; and in this respect also it is unlike vulcanite. It is obvious from all this that neither in the nature of the material of which it is made, nor in the process of manufacture, which is an essential part of the Cummings invention, as we have seen, is the celluloid plate substantially the same as one made of hard rubber.

"Nor is celluloid an equivalent for hard rubber, for the reasons already suggested, that it is not capable of vulcanization, and that it cannot be made into a plate by the process prescribed by Cummings. . . . Celluloid is not an equivalent for the material which the patent makes essential to the invention; and in the use of it for a dental plate the process which is inseparable from the invention is not, and cannot be, employed."

in the manner described in the specification, by embedding the teeth and pins in a vulcanizable compound, so that it shall surround them, while it is in a soft state, before it is vulcanized, and so that, when it has been vulcanized, the teeth are firmly and inseparably secured in the vulcanite, and a tight joint is effected between them, the whole constituting but one piece.' We said: 'The invention is a product or manufacture made in a defined manner. It is not a product alone, separated from the process by which it is created.'

"The process detailed in the description antecedent to the claim, and referred to thereby, is as much a part of the invention as are the materials of which the plate or product is composed. Both are necessary elements of it. Hence, to constitute an infringement of the patent, both the material of which the dental plate is made, or its equivalent, and the process of constructing the plate, or a process equivalent thereto, must be employed.

"It is therefore essential to a correct determination of this case to consider what was the material made by the patentee an element of his invention, and what can be considered an equivalent therefor."

These statements confirm and amplify the former construction of the patent, showing that the improvement was held patentable because it introduced a new interaction between the plate and teeth, in addition to being the substitution of a superior for an inferior material. Thus a substantially new article was created.

PUTNAM *v.* YERRINGTON, 9 O. G. 689.

D. OF N. J., 1876. NIXON, J.

Reissued patent No. 1606, for improvement in bottle-stopper fastenings.

There were four claims, of which the only one adjudged to be valid was as follows:—

"Forming the fastener, at the part that comes over the cork, of a piece of wire of a U form, with the ends returned and connected to the bottle, in order that the pressure on the cork or stopper may cause the fastener to hold more securely, as specified."

This shape of fastener was not new, a patent for one of the same shape made of tin having lately expired; but the plaintiff's wire-fastener, offering less surface to the upward pressure of the cork, became embedded in it (so that the greater the pressure the

more firmly the cork was held down), instead of being pushed out of place, as sometimes happened with the tin fastener. On this ground, that here was not substitution only, but a new effect, the claim was sustained.[1]

DALTON *v.* NELSON, 13 BLATCH. 357.

S. D. OF N. Y., 1876. SHIPMAN, J.

A patent reissued to Oscar T. Earle, June 14, 1870, for a compression steam gauge-cock, described in the specification, the report says, as consisting,

"first, in making one of the surfaces that meet to close the water-way or steam-passage of a piece of vulcanized rubber, which is protected from spreading or confined in metal in such manner that but little more than its bearing or acting surface is exposed;" and, secondly, in making the other surface, which is of metal, in the form of a ring, "so that the rubber may be compressed by the same power more forcibly than if the metal surface were equal in area to that of the rubber."

The invention in this case was the substitution of vulcanized rubber in the opposing surfaces of steam gauge-cocks, where, before this invention, brass or lead, or leather or cork, had been used. All of these previously used substances had failed of their purpose. The brass or other metal was soon roughened or worn by gritty particles in the water, and the leather and cork were destroyed by the steam, which also corroded the lead. The rubber surfaces, having none of these defects, superseded all that were in use before them.

This was, therefore, mainly a case of substitution, though the objection of double use was also raised, as appears from the opinion.

The court said:—

"The difficulty which was to be overcome by the patentee was to make a steam gauge-cock which would not readily leak, and which would resist the action of steam. The result which he attained was the invention of a durable gauge-cock, which remained tight under various pressures and different degrees of heat, and which did not get out of

[1] This patent was sustained also in Putnam *v.* Wetherbee, 1 Holmes, 497, and in Putnam *v.* Hickey, 3 Biss. 157.

repair. This result was accomplished by the discovery of the fact that highly vulcanized rubber, in consequence of its elasticity, would not be ground and abraded by water containing dirt or grit, and, in consequence of its durability and non-corrodible properties, would successfully endure and withstand the power of steam. In the year 1853, the peculiar adaptability of hard rubber to the varied mechanical purposes to which it has since been applied was much less understood than it is at the present time. The invention consisted in the practical application of the discovery by such mechanical means that an efficient gauge-cock was produced.

"An attempt was made to show that this invention had been anticipated by the application of sheets of vulcanized rubber to the edges of the doors or plates of man-holes of steam-engines, and also upon the delivery-valves of engines; but the analogy between the edge of a gasket upon the plate of a man-hole or upon a delivery-valve, and one of the opposing surfaces of a compression steam gauge-cock, which is necessarily opened and closed at frequently recurring intervals, and which should be so constructed as not to become leaky from the constant use to which it is subjected, is so remote, that a rubber gasket cannot with propriety be considered an anticipation of Bisbee's [the original patentee's] invention. The remark of Coltman, J., in Walton *v.* Potter (4 Scott's N. R. 91) seems to be applicable to this branch of the case: 'It appears to me that it' (the plaintiff's invention) 'is a very useful application and adaptation of a substance, the properties and qualities of which for the purpose had never been known before, and, therefore, that it was properly the subject of a patent.'

"Again, the Bisbee invention comes within the principle which was enunciated in Hicks *v.* Kelsey (18 Wall. 673): 'The use of one material instead of another in constructing a known machine is, in most cases, so obviously a matter of mere mechanical judgment, and not of invention, that it cannot be called an invention, unless some new and useful result, an increase of efficiency, or a decided saving in the operation, is clearly attained.' Here, the substitution does not merely produce the same result in the same way, but produces a new result, differing from the former one so materially that it might almost be said that the difference is one of kind, and not of degree. The improvement was of such marked character that the inference is that the new device must have been the result of inventive thought, experiment, and skill, rather than the result of mere mechanical judgment. . . . Let there be a decree for an injunction and an account."

HOLBROOK *v.* SMALL, 10 O. G. 508.

D. OF MASS., 1876. CLIFFORD AND LOWELL, JJ.

Machine for sowing seed.

A claim for making in iron a frame which had before been made in wood cannot be sustained.

BROWN *v.* DEERE, 6 FED. REP. 484.

E. D. OF MO., 1881. TREAT, J.

The substitution of an intermittent rotary seed-wheel for an oscillatory seed-wheel, with the addition of the devices necessary to effect such rotary motion, constitutes a patentable improvement.

PERRY *v.* CO-OPERATIVE FOUNDRY CO., 12 FED. REP. 149.

N. D. OF N. Y., 1882. BLATCHFORD, J.

Improvement in stoves.

Blatchford, J.: —

"All that the patentee did was to substitute a flat grate for a dished grate in the arrangement. The relation between the grate and the bottom of the fire-pot, so as to leave the space between the two and the space around the edge of the grate is the same in the two arrangements. The only difference is one of degree as to the quantity of refuse which the rotation of the grate or the use of the poker will discharge, or one of convenience as to the character of the poker which will be used, and does not involve invention."

In another suit between the same parties, 12 Fed. Rep. 436, Blatchford, J., held that there was no invention in substituting in a stove

"an old grate made in two parts for another old grate made in one part, preserving the same relation of the grate to the fire-pot and to the ash-pit walls, when no distinctive effect in the combination resulted from the substitution."

And so as to a combination of transparent windows in the walls of the ash-pit with certain parts of a stove: —

"A window in an ash-pit cannot modify or affect the action or operation of the grate or of the anti-clinker space, or the isolation of

the grate, nor is the operation or use of the windows affected or modified by the existence or non-existence of any of those features."

The claim of another patent ran as follows: —

"The adjoining flues D and D', situated at the rear of the stove, and having walls built on the casing of the same, in combination with the illuminating doors or windows in the draft chamber, base section."

Blatchford, J.: —

"It is clear that this is not a patentable combination. The flues operate in the same manner, whether there are illuminating windows in the place designated or not."

And other patents for similar aggregations were disposed of by the court.

PALMERBING *v.* BUCHOLZ, 13 FED. REP. 672.

S. D. OF N. Y., 1882. WALLACE, J.

W. E. Brock's patent, No. 76,394, dated April 7, 1868, for "an improvement in dummies for displaying clothing."

Wallace, J.: —

". . . The specification describes the invention to consist of a shell of paper or *papier maché*, resembling in configuration the body of a human being, with legs and arms, if desired. A head-piece of wood or other suitable material is secured in the neck or upper end of the shell into which is fitted a vertical supporting shaft, which extends centrally through the shell and is furnished at its lower end with an appropriate base. The shaft is provided with radial braces, which serve to retain the shell in proper position upon the shaft. It is designed to be an improvement upon the wire dummy in ordinary use for displaying clothing, and contains the same parts and arrangement of parts, except that the paper or *papier maché* shell is substituted for the skeleton frame of the wire dummy. It is shown by the proofs that paper and *papier maché* had been used in constructing lay figures representing various celebrated personages, and it was well known as a suitable material for that purpose previous to its use by the patentee. These lay figures were hollow, and the paper or *papier maché* was used to form the shell or exterior surface of the figures, but the faces and hands were usually made of wax. They were clothed with costumes appropriate to the personages represented.

"Inasmuch as the wire dummies did not contain the paper or *papier maché* shell, and the lay figures did not contain head-piece, shaft, braces, or base of the patented device, they were not anticipations of it. The proofs show that the patented dummy has commended itself to the public interested in such devices. It is a better model of the human figure, and because of the continuous surface of the shell, clothing can be made to fit more accurately upon it than upon the intersticial frame or shell of the wire dummy. But the patent cannot be sustained, because the device is destitute of patentable novelty. If the substitution of the paper or *papier maché* for the wire of the shell or frame was obviously practicable, the patentee was not an inventor. If mechanics skilled in the particular department of construction could have seen at a glance the feasibility of the change, then, although the device may have been mechanically new, it was not intellectually novel. The paper which was substituted for the wire had been used to make the shell of a figure in imitation of the human body, and the figures in which it was thus used had been employed for displaying clothing. The displaying of clothing was not the primary purpose for which these lay figures were intended; but that use was not only suggested, but was very obviously one of the ends in view. Not only, therefore, had the material that the patentee substituted for the wire been employed as he employed it, to make the shell or frame of a figure resembling the human body, but it had also been applied to perform the same office. The new application of an old material to a cognate use will not generally support a patent, but here it was employed in the same use."

ENGLISH CASES.

SAUNDERS *v.* ASTON, 3 B. & Ad. 881; 1 Web. P. C. 75.

King's Bench, 1832.

B. Saunders's patent of Oct. 13, 1825, No. 5264, for "improvement in making buttons."

It consisted in the combination of flexible shanks with a metallic, cloth-covered button. The patent claimed

"the substitution of a proper soft and flexible material or materials in place of metal shanks, to all such buttons as may be formed in the various methods herein described."

There was also a ring or collet for fastening the button to the shank. The objections to the patent, and their effect, were thus stated by Littledale, J.: —

"Neither the button nor the flexible shank was new; and they did not, by merely being put together, constitute such an invention as could support this patent. It is contended that the operation of the collet, under the present patent, is new; but that is not stated in the specification as the object of the invention, and it is, in fact, only one mode of carrying it into effect; it appears on the plaintiff's case that there were other ways of producing the same result. I think, therefore, the nonsuit was right."

MACKELCAN *v.* RENNIE, 13 C. B. N. S. 52.

COMMON PLEAS, 1862.

The plaintiff's patent was for "improvements in floating-docks."

"It was proved at the trial that the construction of the floating-docks was not new. The plaintiff then said that his invention consisted, not in the construction of floating-docks, but in the application of iron in the place of wood to their manufacture. The court, having determined that this claim was not borne out by the specification, continued: —

"'We think it right to add, that it must not be inferred that the court entertains an opinion that the alleged invention, even if it were appropriately claimed, could properly be the subject of letters-patent. It is unnecessary on this occasion to give any opinion upon that point; but we wish not to be supposed to sanction such a notion.'"[1]

THOMPSON *v.* JAMES, 32 BEAV. 570.

ROMILLY, M. R. 1863.

C. Amet's patent of July 22, 1856, No. 1729, for a flexible petticoat or "crinoline." The alleged invention was simply the substitution of steel springs for cane or whalebone in petticoats. This was held not patentable.

[1] This abstract is taken from Higgins' Digest of Patent Cases, page 43.

HORTON *v.* MABON, 16 C. B. N. S. 141.

EXCHEQUER CHAMBER, 1864.

Cockburn, C. J.: —

"That which the plaintiff claims as part of his invention is the substitution of *double* angle-iron for two pieces of *single* angle-iron in the formation of hydraulic cups or joints to telescopic gas-holders. Now, it was matter of general knowledge that the cups might be formed by riveting two pieces of single angle-iron to a plate; and we agree with the Court of Common Pleas in thinking that the mere substitution of double angle-iron — an article well known in the trade — is not an invention for which a patent can be granted."

HINKS *v.* SAFETY LIGHTING CO., L. R. 4 CH. D. p. 615.

JESSEL, M. R., 1876.

J. & J. Hinks's patent of Oct. 18, 1865.

A combination in a lamp of two wick-cases with a double-slotted cone. A device offered in evidence by the defence was similar to this, except that it employed a flat wick instead of a round one.

Jessel, M. R., said: —

"On the one hand, it was said you can never support a patent by substituting a round wick for a flat wick, as there is no invention in that. On the other hand, it was said, why not? If it is a combination patent, the very essence of a combination patent is that it is a new combination of known parts; and, in fact, very few machines are now invented which contain any new part. As a general rule, every machine invented is made up of parts previously known. A new part of a machine is very uncommon indeed; consequently that is an objection which, *per se*, is not of great weight. But, like every combination which is new, it must have merit; and now, how is a judge to apportion the merit? I do not know. As far as I can ascertain from the authorities, the merit very much depends on the result produced. Where a slight alteration in a combination turns that which was practically useless before into that which is very useful and very important, judges have considered that, though the invention was small, yet the result was so great as fairly to be the subject of a patent; and, as far as a rough test goes, I know of no better."

And on this ground he decided in favor of the plaintiff's combination.

Other cases of substitution are as follows, *ante* : —

CHAPTER VII.

PRINCIPLE.

"*Principle*" *defined.*

168. THE term "principle," in the patent law, has two or three different meanings. Applied to a machine, it indicates the idea, or, as Mr. Justice Bradley[1] termed it, the "conception," which is embodied in the machine. Thus, the principle of one machine is often said to be the same as that in another, although the two machines may differ in form. The word is so used in the statute, where it is provided (sect. 4888) that,

"before any inventor or discoverer shall receive a patent for his invention or discovery, he . . . shall file in the Patent Office a written description of the same, . . . and in case of a machine, he shall explain the *principle* thereof, and the best mode in which he has contemplated applying that *principle*, so as to distinguish it from other inventions," &c.

And, in fact, every invention has its principle.

169. Again, principle means a rule according to which the statute is construed and judicial decisions are made; for we speak of the principles of the patent law.

But, chiefly, "principle," as now used, means a law of nature or a property of matter, or some fact as to the relations or the capacity thereof. Perhaps it would be more correct to say that the term "principle" is used to indicate patents for a process, the gist of which is the operation or the application of some law of nature or property of matter. The patentee has discovered a law of nature or property of matter, or some fact unknown before as to the capacity or the relations thereof, and he has turned his discovery to account in a practical art or process; or else the principle concerned being known before, the patentee is the first to invent a practical application of it to some particular end.

[1] In the case of Bischoff *v.* Wethered, 9 Wall. 812.

The famous discovery of Neilson is an instance of the first sort, and the more brilliant invention of Morse is an example of the second.

170. Every invention, indeed, involves a principle. Every patentable improvement is but a new way of applying some law of nature or property of matter, *i. e.* a principle. This is true of inventions as well as of discoveries; of a rat-trap as well as of Neilson's process. But in the case of most inventions, the forces or properties employed are lost sight of. All that the mind of the inventor contemplates is the material wherein and the adjustment whereby they operate. Thus, in a machine, the forces or properties of gravity, motion, inertia, or whatever they may be which operate in and through the mechanism, are not the objects to which the inventor's mind is directed. On the contrary, he does not think of them at all. His efforts are spent, not to use certain forces or properties (principles), but to make a certain mechanism; whereas in cases of principle, strictly, whether the patentee has first discovered and applied, or has only first applied, the principle, the operation of the principle is the gist of the process. In cases of principle, the novelty of the vehicle is unimportant. If the patentee is the first to employ a certain principle for a certain end, the validity of his patent is not affected by the fact that he uses an old apparatus for the purpose.[1]

171. It might be thought simpler to divide all patents into those for discoveries and those for inventions; and for some purposes such a division is requisite.[2] But it does not harmonize with the division indicated by the term "principle," because, as we have said, all processes are not the result of discovery; for sometimes the process consists in the application of a known principle.

172. Again, it might seem best to make the division between patents for a process on the one hand, and all other patents on the other. But all patents for a process do not involve a principle in the manner that we have described.

Most processes, indeed, do involve a principle, and most discoveries result in a process; but there are processes in which the

[1] Le Roy *v.* Tatham, 22 How. 132; Poillon *v.* Schmidt, 6 Blatch. 209.
[2] *Vide* Introduction, pages 2, 8, 9.

mechanism or apparatus used is the whole invention, the physical force or forces employed being left out of sight, so that these are not cases of principle; and, again, there are discoveries which do not result in a process, as, for instance, when a new property is discovered in an old substance, by reason of which the old substance can usefully be employed in a new situation. It is necessary, therefore, following the classification established in the patent law, to consider, by themselves, the few but important cases involving a principle in the sense which we have indicated.

173. It is hardly necessary to add, that if a patentee has described an otherwise patentable process or contrivance of any sort, it is not essential that he should know the principle upon which it operates.[1] If he describe a contrivance by means of which the principle is utilized, then he has conferred upon the public the practical benefit of the principle in question. The primary cause of that benefit is a fact of science, not an improvement in the arts.

174. It follows, of course, that the mere discovery of the physical fact upon which a contrivance already existing depends confers upon the discoverer no right to a patent.[2] On the other hand, if a patentee has described some new and useful method of employing a principle, it is no objection to his patent that the principle employed has already been in some sort of undiscovered and, so to say, unutilized operation.[3]

A Naked Principle, and the Application of a Principle.

175. With these preliminary remarks we may address ourselves to the subject in hand.

It is generally said that a principle cannot be patented, but only the application of a principle, by which application a useful result is produced. So long as the principle is a mere item of knowledge, — and sometimes from its nature it must always remain such, — no patent can be had, however brilliant and useful the discovery may be.

[1] Pearl *v.* The Ocean Mills, 11 O. G. 2; Andrews *v.* Cross, 19 Blatch. 294.

[2] Patterson *v.* Gas Light & Coke Co., L. R. 3 App. Cas. 239.

[3] Andrews *v.* Carman, 13 Blatch. 249; Tilghman *v.* Proctor, 102 U. S. p. 711.

Said a learned judge : —

"Men may be enriched or made happy by physical as well as by moral or political truths, which, nevertheless, go without reward for their authors. He who devised the art of multiplication could not restrain others from using it after him without paying him for a license. The miner who first found out that the deeper veins were richer in metal could not compel his neighbor to continue digging near the surface." [1]

176. But if the principle discovered is harnessed, so to say, into some device or process, then, to that extent, it is transferred from science to the arts, from the world of ideas to that of things, and the application is patentable.

177. Two difficult questions arise : —

(1.) What is the distinction between a naked principle and a principle susceptible of an application which may be patented?

(2.) When a principle is the basis of a patent, does the patent cover every application of the principle to the end set forth by the patentee, or only the particular application described by him?

We venture to say that no branch of the law presents questions of greater nicety than these; and we beg the indulgence of the reader if we do not answer them with precision.

The Different Cases of Principle.

178. Having stated the general rule of patentability when a principle is involved, we proceed to mention the various forms which cases of principle may take, whether patentable or not.

(1.) The discovery of a principle which carries with it no suggestion of practical use, which also is accompanied by no such suggestion on the part of the patentee.

An example is the mere announcement of a law unknown before the announcement; as, for instance, that heavy bodies fall no faster than light ones in a vacuum.

(2.) The discovery of a principle, in consequence of *the knowledge* of which something is done or forborne; which something, nevertheless, is not a process, but merely an act or course of action. The principle mentioned in the quotation above made,

[1] Kane, J., Detmold *v.* Reeves, 1 Fish. 127.

namely, that the deeper veins of metal are the richer veins, is an instance.

(3.) The discovery of a principle, in consequence of the knowledge of which a process is pursued and described.

For example: some years ago the discovery was made that oil lies in small crevices and seams of the rock which contains it; and the discoverer of this fact invented an explosive process by means of which he extracted the oil.[1]

A more difficult case is the following: One Atwood discovered that the mucous membrane in fish, between the skin and the flesh, decomposes more rapidly than any other part of the fish; and he described a process of curing fish wherein removal of this membrane was the salient feature.[2]

(4.) The discovery of a new principle, the application of which is described, which application, however, is either so obvious or so simple that it cannot be dignified with the name of process. The principle is almost identical with its application. An instance is the ether case, where the discovery was that inhalation of ether fumes produces insensibility to pain.[3]

(5.) The obvious application of a known principle; a process or other contrivance founded upon or involving a known principle, but requiring no invention, the principle concerned being of such a character that any one informed of it would be able to apply it. Such an application would not be patentable.

We cannot cite any actual case of this sort; but we shall have an example if we suppose that Neilson's law, instead of being his discovery, had already been stated in some published work. In that case his application of it would not have been patentable; for the evidence was, that any one skilled in the art concerned would have been able to apply the principle had it been announced to him. Such a case as this might also be ranged under another rule of the patent law; namely, the rule that if one derives the substantial part of his improvement from another, so that no invention is required on his part, he may not have a patent.[4]

(6.) The invention of a new way of applying a known principle.

[1] Roberts *v.* Dickey, 4 Fish. 532.

[2] Crowell *v.* Harlow, 1 Fed. Rep. 140.

[3] Morton *v.* New York Eye Infirmary, 5 Blatch. 116.

[4] *Vide post*, page 623.

Such was the invention of Morse. He devised a method of applying electro-magnetism, well known before his discovery, to the transmitting and recording of intelligible signs at a distance from the operator.

(7.) The discovery of a new principle, coupled with the description of a process in which it operates for the service of man. The celebrated case of Neilson *v.* Harford, in England,[1] furnishes an illustration.

Neilson discovered that a hot blast is more effective than a cold blast in a furnace. And he described a means of carrying this principle into effect by interposing a receptacle, with a fire underneath it, wherein the blast was heated on its way to the furnace.

(8.) The discovery of some fact as to the nature of a known principle, which discovery renders possible a new application of that principle.

No question of patentability arises in regard to these last three classes. The difficulty here is as to the scope of the patent. We shall discuss it presently.

The First Two Classes of Principle.

179. In considering these different kinds of discovery, it must be borne in mind that they are patentable, if at all, as *arts*. The statute limits patentable subjects by the words "art," "machine," "manufacture," "composition of matter," or some "improvement thereof." Inventions involving the application of a principle are commonly processes, and a process is an art.[2] It is plain, therefore, that the exclusion of the first two classes from the operation of the statute is required by its terms.

180. As to the first class, a law of nature or a property of matter, in the abstract, is clearly not an art. It is often a meritorious and a brilliant achievement to discover and proclaim some new physical truth, and useful results may follow, for other persons may invent a practical application of the force thus re-

[1] *Vide post*, page 611.

[2] The English statute provides that patents may be granted only for "the sole working or making of any manner of *new manufacture*." "Manufacture," however, was, at an early date, held to include "method" or "process." *Vide* the opinion of Eyre, C. J., in the great case of Boulton *v.* Bull, 2 H. Bl. p. 491.

vealed. But the mere announcement of that force is the statement of a fact, not the description of an art.

181. In cases of the second class, the announcement of the principle amounts to a suggestion of an advantageous course of conduct; but no art or process is described or indicated. Something is done or forborne in consequence of the knowledge of the principle, but the principle is not made to exert itself; neither is any art or process described having the principle as its foundation.

To consider the example we have given, the physical fact that minerals are richest in the deep veins can be taken advantage of, but it cannot be embodied in a process. There is nothing that can be made to act.

It might be said that the discovery amounted to an improvement in the art or process of mining; but no new process was invented, for other persons had dug deep in search of minerals before this discoverer. He merely ascertained that a course — it cannot be called a process — which had sometimes been pursued was always beneficial. If it is not a *process* to search the superficial veins rather than the deep ones (and no one would contend that it is such), then it is no improvement of a process to discover that the deep veins make the better return.

The Third Class.

182. We come now to the third class.

In the oil case, it was immaterial whether the patentee had himself discovered the principle concerned or not; for, given the principle, invention was required to devise the process founded upon it. This fact distinguishes the case from that cited as an illustration of the second class, where no real process could be described.

The fish case is more difficult. If the patentee had *not* been the discoverer of the principle concerned, then, unquestionably, his patent would not have been sustained; for, given the principle, the putrefying capacity of the mucous membrane, no invention is required to devise a process, the gist of which is simply removal of the membrane by cutting it out. This case, therefore, directly raises the question, presently to be discussed, whether the *discoverer* of a principle stands in any better position

than he who has merely applied a known principle. If we answer this question in the affirmative, then the objections to a patent in the fish case can be surmounted.

It might be said, indeed, that the principle, in this case the putrefying capacity of the membrane, is not made to exert itself; it is not applied. On the contrary, it, along with the substance wherein it resides, is got rid of. This is true enough; but the distinction between this and the mineral case is that here a *new process* is described. That process, or art, is based upon the patentee's discovery. The principle discovered does not, it is true, act in and through the process, but it renders that process possible.

And no one can say that the process was not new and useful.[1] It was therefore patentable. If, however, we do not take into account the fact that the patentee was the discoverer of the principle, then it cannot be said that his process was, in the patent law-sense, a new one; for if the putrefying capacity of the membrane were already known, no invention was required to inform the world that fish could best be cured by removing the membrane.

The Fourth Class.

183. The fourth class, illustrated by the ether case, is the most difficult.

On the one hand, the principle is *applied*, because it is made to exert itself; the narcotizing faculty of the ether fumes is caused to operate, by inhalation, on the human system. Here, then, is a direct, physical, literal application of the principle, the principle being this peculiar faculty of the fumes of ether.

But it is said this effect, which the patentee would call the application, is the very thing that was discovered. An *effect* was discovered, and there can be no application of an effect; therefore no patent can be granted for the discovery.

To which it might be replied that, because the principle and

[1] Judge Lowell said: "It would not be invention to salt a fish more or less thoroughly; but a patent might properly be granted for curing fish with a substance which had never before been used for any similar purpose, and which would effect the old result of curing the fish in a better or cheaper way, of which last fact the infringement would be sufficient evidence. I am unable to distinguish between adding and taking away, if the result is to improve the art."

its effect are bound up together, are synonymous, if you will, it does not therefore follow that the principle is not applied. Even supposing that knowledge of the principle is gained only through the effect, and supposing further that the discoverer's knowledge of the principle was limited by his knowledge of the effect, still it must be remembered that *principle* means the physical force or property that is discovered, and if that principle is applied, a patent may be had. It makes no difference how the discoverer attained to knowledge of the principle, or how limited his knowledge of it is, or that the principle, so far as it is known, and the effect of the principle, are one and the same thing.[1] All that the law requires is a principle (property of matter), and its application to a practical use.

184. But, again, it is said, a patent, if granted for the ether discovery, would really be for the principle (an occurrence unknown in the patent law). This for two reasons, first, because knowledge of the principle carries with it knowledge of the application. The application is obvious. Any one,—not merely any one skilled in the art of surgery, but any person of average intelligence,—once informed of the principle, would be able to apply it. The essence of the discovery was, that by inhalation of the fumes of ether insensibility is produced. And the process of inhalation is a familiar one.

Secondly, nothing in the nature of a contrivance, through which the principle might be applied, is necessary. Presence of the ether, and inhalation of its fumes, are the only conditions upon which the benefit of the discovery depends. These statements, certainly, are true; the application of the principle was obvious, and the principle did not operate through any contrivance, mechanical or otherwise: it operated directly.

185. These objections, however, may be met as follows: As to the first one, a patent based upon a *new* principle is never impugned on the ground that its application is obvious to any one skilled in the art to which it belongs. We do not perceive, therefore, why

[1] It is true in the Neilson case also that an *effect* was discovered, namely, the effect of a hot blast in the furnace; and any one skilled in the art of furnace-building, once informed of the value of that effect, would have been able to bring it about. The only difference between the hot-blast and the ether case is, that in the latter no *contrivance* was necessary as a vehicle for the principle. This difference is treated of *infra*.

the fact that its application is obvious to everybody should be an objection to it. Certainly it would be drawing a very fine line between different discoveries if they were held patentable when their application was obvious to some people only, and not patentable when their application was obvious to everybody.

186. The second objection made in the ether case, that no contrivance was necessary or possible for the operation of the principle, is a more serious one. This point—namely, whether a principle must require some contrivance, mechanical or otherwise, for its application, in order to be the basis of a patent—has never, we believe, been decided by the courts, except in the ether case. In that case, the patent did indeed describe a method of administering the ether by means of a sponge; but these directions did not amount to a process. The real art or process discovered was that of producing insensibility by means of ether fumes. Now, if the administration of the ether had required a long process, or any sort of device or apparatus, then a patent for the application of the discovery would have been held valid. Moreover, in such case, the patent would be held to cover not only the particular apparatus or device described by the patentee, but every apparatus or device for the administration of ether to produce insensibility in animals.

Is, then, a patent to be refused in the actual ether case because the art discovered is a simple one? It was none the less an art, namely, the art of producing insensibility in animals.[1]

To make the patentability of a discovery depend upon the complexity of the means through which the force discovered operates, is, we cannot help thinking, to establish a vicious distinction between patentable and non-patentable discoveries. It will be found, in fact, that, as a rule, the more brilliant and useful the discovery, the simpler is its application.

187. We therefore propose with confidence the criterion we have already suggested; namely, the possibility of making the principle discovered operate for the service of man, whether directly or through some contrivance.

[1] The patent claimed it as "an improvement in the art of surgery," which, plainly, it was not, any more than a new surgical instrument would be an improvement in the art of surgery, as Judge Shipman remarked. The patentability of the thing discovered was, however, considered more broadly by the court.

In truth, a law of nature or property of matter acting to produce some useful end is a process or art. Whereas, in cases like that of the minerals, the operation of the law of nature concerned was over ages ago, and as a *result* the minerals are found chiefly deep in the earth. Here no force operates, and no process is described. A fact is made known, and the fact carries with it a suggestion as to the value of a certain course of conduct, which was not even a new course.

Scope of the Patent.

188. We come now to the second of the two questions with which we started; namely, that as to the scope[1] of a patent based upon a principle or upon the application of a principle. This question arises in regard to the last three classes of principle that we have enumerated. It is commonly put thus:—

"Shall the patent cover every application of the principle to the end proposed by the patentee, or only the application which he has described, with, of course, all colorable imitations thereof and substantial equivalents therefor?"

189. It is, indeed, universally declared, as we have seen, that a principle cannot be patented, and therefore, it is said, a patent may not be held to cover every application of the principle to the end proposed by the patentee, because that would be in effect to patent the principle itself. There is no difference, it is said, between a patent for a principle and a patent for every application of a principle to a particular end. And this in most cases is practically true, for commonly there is no other end to which the principle can be applied.

190. One distinguished judge only, so far as we know,—Mr. Justice Nelson,—has laid down the more liberal doctrine, saying in so many words that when the application of a principle, *a fortiori* when the principle itself is discovered, the patent should cover every application of the principle to the end proposed by the patentee that can possibly be made. He thus stated the law in his dissenting opinion in the first suit of

[1] Here we might be thought to depart from the general plan of this book. But in cases of principle we cannot discuss the question of patentability without touching upon that of infringement. In these cases it is necessary to consider the scope of the patent in order to determine precisely what is patentable.

Le Roy *v.* Tatham,[1] presently to be considered, and in the Circuit Court case of Foote *v.* Silsby,[2] wherein he first announced the principles afterward more fully set forth by him in the dissenting opinion referred to.

191. But although Judge Nelson's statement of the law is heterodox, the conclusion to which it led him is the same as that which the courts commonly reach, though by a different route. And in this way. A patent based upon a principle, or upon the application of a principle, is, of course, usually a patent for an art or process; and the efficacy of the process depends upon the principle, — in fact, the process is usually nothing more or less than the operation of the principle. The process is therefore very nearly the same as the principle; and it is commonly construed by the courts so broadly as practically to include every application of the principle to the end proposed by the patentee.

Argument upon this question, therefore, often becomes a mere dispute about words. The point is, what shall the patent cover; and if the process it describes is held to include every application of the principle to the end in question, then the patent is practically as controlling as if it were for the principle; and in such case it is idle to dispute whether or not a principle may be patented.

192. The fact, however, that certain patents involving a principle have practically been construed to include every application of the principle involved, is merely an accidental fact. It so happens that in these cases the process described was essential to every application of the principle which it employed to the end in view; but this fact does not alter the general rule, and a case might well arise where the principle discovered could be applied to the end proposed, and yet applied in such a manner that the process patented would not be infringed.

[1] 14 How. 156. Judge Nelson's dissenting opinion is a very able one. *Vide post*, page 578.

[2] *Vide post*, page 564. The patent was for an application of the well-known principle, that metals are expanded by heat and contracted by cold, to the regulation of a stove-fire by means of a brass rod connected through levers with the damper.

Judge Nelson held that the patent covered every application of this principle; not only that which the patentee had invented, but any which employed this contracting and expanding capacity of metal to the regulation of a stove.

On appeal to the Supreme Court the patent was upheld, but it does not appear on what ground. *Vide post*, page 571.

193. We shall return to this discussion presently; but having indicated the points mooted, we proceed to consider the few important cases on the subject, first, however, begging the reader to remember that in every case the patent is for a process, and that in these cases, as in all others, the scope of the patent is limited only by the gist or essence of the invention. If, therefore, the gist of the process described is inseparable from the principle it embodies, — if, in other words, it is impossible to apply the principle without using the gist of the process patented, — then the patent practically covers every application of the principle; and if that is patenting a principle, then it must be true that a principle may be patented.

The Hot-Blast Case.

194. The leading English case upon the subject is that of Neilson *v.* Harford. The decision made in this case has often been discussed by the courts of this country, and sometimes explained, but its correctness has never been doubted or denied.

Neilson discovered, as we have seen, that a blast of hot air is more effective in smelting-furnaces than the cold blast universally used before his discovery. This truth was exactly contrary to the general conviction, which was founded upon the fact that the furnace fires burned better in winter than in summer. In reality, this was because the air is drier then, not because it is colder. Mr. Neilson, therefore, discovered a scientific fact; namely, that hot air increases the heat of a furnace fire more than cold air.[1] He stated in his patent[2] that the blast should be

[1] Strictly speaking, there was perhaps no law of nature or property of matter discovered by Mr. Neilson.

In fact, he may be said to have discovered the non-existence of the supposed law or property that a cold-air blast is the more conducive to a hot fire. This supposed law was founded, as we have seen, upon the observation that the furnace fires burned best in winter. Mr. Neilson having discovered the non-existence of such a law, — in other words, having discovered that there was not, as had been supposed, some occult reason why cold air was better than hot air for the purpose in question, — the ground being thus cleared, it was plain, perhaps, that the introduction of air already heated to some extent would allow that part, so to say, of the furnace heat which otherwise would have been spent in raising the newly admitted air to the temperature of hot air, to be employed in rais-

[2] The specification is quoted in full at page 611, *post*.

heated in a receptacle interposed between the air blast and the furnace. He said that the receptacle might "conveniently be heated by a fire distinct from the furnace fire;" and he gave general directions as to its size. He added, however, that the form of the receptacle was immaterial to the effect produced.

195. At the trial it was proved that the defendants used a series of tubes or pipes in which to heat the air blast, and it was also proved that these tubes or pipes were much more effective than the rectangular chamber used by the patentee. But the court held that the tubes or pipes were covered by the word "receptacle," and that when the patentee said the form of the receptacle was immaterial to the effect produced, he meant immaterial to the *amount* of effect produced, — a statement which the jury found to be correct.

196. In this case, therefore, the patent practically was held to cover every application of the principle to the end proposed by the patentee.

As was remarked by a learned counsel in a recent case: —

"It is a fact that no man has been able to attain Neilson's results in a blast furnace without blowing in hot air; and it is a matter of physical necessity that this cannot be done unless the air be artificially heated between the general atmosphere whence it is taken, and the furnace where it is to act, so that his patent was practically as controlling as if for a principle."

ing the temperature of all the air in the heat less the amount of heat required to raise air newly introduced to the temperature of that already in the furnace. This is perhaps an isolated case, being one where the discovery, strictly speaking, was not of an unknown principle, or of the application of a principle, but of the fact that a certain principle or certain principles control the operation of a certain agent, instead of a certain other principle erroneously supposed to do so.

the furnace to a point above that of the hot air freshly admitted. By this road, however, we come to about the same conclusion as that reached by the course ordinarily pursued with regard to this case; for, according to the statements we have just made, Mr. Neilson, in discovering the non-existence of a supposed law. also and at the same time discovered, if not a new law, yet under what well-known law the air blast operates, — although the law thus shown to control the operation of the air blast be so simple as this, namely, that the whole is greater than its parts; in other words, that all the heat generated by the fire will be more effective to raise the temperature of the furnace than all

These remarks we make, not to disparage but to support the ordinary classification of this case as one of the discovery of a principle.

This classification of it is, as we have seen, both apparently and radically correct, though it appears otherwise when it is first called in question.

The truth of this statement may be shown as follows: The air blast must be heated in the furnace or out of it; we do not perceive any third possibility. But if it be heated in the furnace, it must be in a receptacle placed there; for the object of the hot blast is that the furnace fire shall not expend any part of its strength in heating the air blast, as it enters the furnace, to the temperature of the air already in the furnace. Even in this case, therefore, as well as when the air blast is heated outside of the furnace, there is a receptacle interposed between the outside air and the furnace air, in which receptacle the air blast is heated. It is, therefore, as the learned counsel said, impossible to apply Neilson's principle without using Neilson's process.

It is true, we presume, that the air to be used might be heated before it was conveyed into the blast; the blast might be interposed between the heated air and the furnace. But a claim in Neilson's patent could easily be framed so as to cover such an arrangement.

The Lead-Pipe Cases.

197. The first American case in which the scope of a patent founded upon a principle was in question is that of Le Roy *v.* Tatham,[1] already referred to.

The patent was for a new process of making pipe out of lead and other soft metals. The mechanism used was old, but the process was new; and it depended upon a discovery

"that lead, when recently become set, and while under heat and extreme pressure in a close vessel, would reunite perfectly after a separation of its parts."

This property of lead was unknown before. The defendants made use of the same property to form lead pipe, but their mechanism was different. The claim was as follows: —

"The combination of the following parts above described; to wit, the cone and bridge, or guide-piece, with the cylinder, the piston, the chamber, and the die when used to form pipes of metal under heat and pressure, in the manner set forth, or in any other manner substantially the same."

198. The majority of the court held that by the claim the patent was limited to the particular mechanism described. The

[1] 14 How. 156.

minority (Nelson, J., delivering the opinion, already quoted from) held that the patent might more liberally be construed to embrace any mechanism by which the property discovered in lead was made use of for the purpose specified by the patentees.

199. Judge Nelson said that, as he understood the opinion of the majority of the court, they denied, not the doctrine that he maintained, but its applicability to the case before them. And this appears to be so from the following passage in their opinion: —

"*A new property discovered in matter, when practically applied in the construction of a useful article of commerce or manufacture, is patentable;* but the process, through which the new property is developed and applied, must be stated with such precision as to enable an ordinary mechanic to construct and apply the necessary process. This is required by the patent laws of England and of the United States, in order that, when the patent shall run out, the public may know how to profit by the invention. . . . The question whether the newly developed property of lead, used in the formation of pipes, might have been patented, if claimed as developed, without the invention of machinery, was not in the case."[1]

They also approved of Neilson *v.* Harford.

200. Subsequently this same patent was again brought before the Supreme Court, this time by a bill in equity. It was sustained, and the defendants, who were the same as in the previous case, were held to infringe it. The opinion, by Mr. Justice McLean, is extremely obscure; but it is to be supposed that the patent received the construction put upon it by Mr. Justice Nelson in his opinion, dissenting from the former judgment.[2]

201. In this case, therefore, as we understand it, a new property of matter, a principle, was discovered, and the patent based upon it was rightly held to cover every process for making lead pipe which depended for its efficacy upon the newly discovered property of lead.

[1] *Vide* page 576 for a long quotation from the opinion.

[2] According to Blatchford, J. (*post*, page 576), "the claim was stated by the court to be a claim to the machinery only when used to form pipes of metal under heat and pressure; and it was sustained by the court against the objection that it only claimed the application of an old machine to a new use, or to produce a new result."

The Morse Case.

202. In the mean time, however, between the two suits of Le Roy *v.* Tatham, the leading case of O'Reilly *v.* Morse was decided.

In this case no principle was discovered, but a method of applying certain known principles was invented.[1] In the hot-blast case and in the lead-pipe case, as we have seen, the principle — the law of nature or property of matter — was itself discovered; whereas the chief principle made use of by Morse was known when Franklin drew the electric current along the string of his kite from the clouds to the key which he held in his hand, and, indeed, it was known long before that celebrated experiment was performed.

203. It was known when Morse made his invention: —

(1.) That electricity could be produced by the action of sulphuric acid upon certain metals; this is galvanism.

(2.) That iron was magnetized by and during the passage of an electric current through a coil of copper wire surrounding it.

(3.) That electricity would pass over a wire until the fluid was exhausted.

204. Morse applied these principles to transmitting and recording at a distance from the operator intelligible signs or letters.

In this invention two principles or physical truths were involved: first, that the electric current is a moving force; second, that the electric current passing around iron magnetizes it. Morse employed them both, — the electric current to carry his message, and the electro-magnet to record it. He described the apparatus which he used.[2] But he claimed his process broadly in the famous eighth claim, which ran as follows: —

"I do not propose to limit myself to the specific machinery or parts of machinery described in the foregoing specification and claims, the

[1] We shall point out presently the bearing of this distinction.

[2] It was as follows: —

The current of electricity passes along the wire to the further end, where the wire is attached to a coil of copper surrounding a piece of iron. The electricity thus passing about the iron magnetizes it. Close to the iron, but retained above it by a spring, is a small piece of metal. When the iron is magnetized by passage of the current around it, it attracts the piece of metal with power enough to overcome the resistance of the spring, and to cause the metal and the magnet to unite. When the current is broken the metal is released, and the spring

essence of my invention being the use of the motive power of the electric or galvanic current, which I call electro-magnetism, however developed, for marking or printing intelligible characters, signs, or letters, at any distances, being a new application of that power of which I claim to be the first inventor or discoverer."

205. This claim a majority of the court held to be invalid, Mr. Chief Justice Taney delivering their opinion. The ground was that the claim was for a mere abstraction, for a naked principle; that, as it made no reference to any apparatus or detailed process, it was to be considered as if Professor Morse had claimed a patent simply for marking intelligible characters at a distance by using the electric current as a motive power, without specifying how it was to be done; and, furthermore, that the claim would cover every improvement in the use of the electric current for this purpose that might thereafter be made; that Professor Morse claimed not only his way of using it, but every other possible way. The Chief Justice said: —

"For aught that we now know, some future inventor, in the onward march of science, may discover a mode of writing or printing at a distance by means of the electric or galvanic current without using any part of the process or combination set forth in the plaintiff's specification. His invention may be less complicated, less liable to get out of order, less expensive in construction and in its operation. But yet, if it is covered by this patent, the inventor could not use it, nor the public have the benefit of it, without the permission of this patentee.

"Nor is this all. While he shuts the door against inventions of other persons, the patentee would be able to avail himself of new discoveries in the properties and powers of electro-magnetism which scientific men might bring to light. For he says he does not confine his claim to the machinery or parts of machinery which he specifies, but claims for himself a monopoly in its use, however developed, for the purpose of printing at a distance.

draws it up again. Morse pointed the end of this piece of metal so that it became a stylus, and by means of clockwork he caused a narrow ribbon of paper to pass over the magnet, and between it and the stylus.

Alternately completing and breaking the current brings down the stylus upon the magnet in a succession of taps, at each of which the intervening paper is punctured by a dot. Each letter of the alphabet is represented by a number of dots; so that the proper number of punctures, made by completing the circuit, separated from the next group of punctures by a space longer than that between the individual punctures, would represent the letters indicated, respectively, by the number of dots in each group.

"New discoveries in physical science may enable him to combine it with new agents and new elements, and by that means attain the object in a manner superior to the present process, and altogether different from it. And if he can secure the exclusive use by his present patent, he may vary it with every new discovery and development of the science, and need place no description of the new manner, process, or machinery upon the records of the Patent Office. And when his patent expires, the public must apply to him to learn what it is. In fine, he claims an exclusive right to use a manner and process which he has not described, and indeed had not invented, and therefore could not describe when he obtained his patent.

"The court is of opinion that the claim is too broad, and not warranted by law."

Wayne, Nelson, and Grier, JJ., dissented, the last named delivering their opinion.

206. The obvious answer to this argument is that subsequent improvements in the use of electro-magnetism for marking intelligible signs at a distance from the operator might be patentable, although they infringed this claim, just as a patentable improvement may be made upon a machine, although such an improvement cannot be used upon the machine without a license; otherwise, the machine patent would be infringed. It is, therefore, an utterly wrong conclusion that a patent to Morse covering every application of electro-magnetism to telegraphy would stop the progress of invention, or deprive subsequent inventors of their rightful reward. And this answer to the argument of the Chief Justice was made in the dissenting opinion, delivered by Mr. Justice Grier.[1]

207. But, possibly, the idea of the majority of the court was that the eighth claim was so worded as to exclude the operation of this familiar principle, that subsequent improvements upon a patented invention are patentable; in other words, they may have thought that Morse in this claim meant to appropriate all such possible improvements to himself, to claim every invention which could not be used without his invention.

If this be so, then, this famous claim was rejected on account of the terms in which it was expressed, and its rejection establishes or overthrows no principle of law, for neither Professor Morse nor anybody else ever meant to assert that a patent for

[1] *Vide post*, page 584.

the application of a principle should cover every improvement that might subsequently be made in the manner of the application.

208. On the other hand, the majority of the court may have meant that Professor Morse, having discovered the application of a known force, — electro-magnetism, to a particular purpose, — the transmission of intelligible signs, was not entitled to have a patent covering every application of electro-magnetism to that purpose, but only a patent covering *his* application of the same, with, of course, all infringements thereof.

It is highly probable that the ground last stated is that on which the majority of the court stood; and we believe that their interpretation of the claim was correct, whatever may be thought of the validity of the claim so interpreted. Morse, being the first to use a particular agency, electro-magnetism, for a new purpose, the transmission of intelligible signs, asserted, in his eighth claim, the right to be protected in every use of that agency for that purpose; in other words, he claimed every application of the principle applied by him to the end attained by him. But the court said, You cannot have a patent for every application of your principle to your object, whatever the modifications or additions; you can have a patent only for the application that you have described, — for the method or process by which you cause electro-magnetism to operate for the transmission of intelligible signs.

"*Application*" *and* "*Process.*"

209. The difference between the two rules (*i. e.*, between the rule that the patent shall cover every application of the principle involved, and the rule that it shall cover only the process described) concerns not merely the reason why an infringement would be held to be such, but one rule establishes a limitation as to infringement which does not follow from the other. Thus, if not in the case of the Morse invention, yet in some other it might well happen that the alleged infringer should make use of the same principle which the patentee was the first to apply, for the same purpose, and yet in a manner that, according to the ordinary canons of infringement, would be neither a substantial equivalent nor a colorable imitation. In such a case, therefore, the patent would not cover the alleged infringement except upon the theory

that the patent included every application of the principle involved to the end proposed by the patentee. This truth should be borne in mind.

The Neilson Patent and the Morse Patent compared.

210. We have seen that in the hot-blast case the patent was held to cover, practically, every application of the principle to the end proposed by the patentee, including one which he had not described, which also was more effective than that which he used himself. But there is a difference between this and the Morse case. A claim in the hot-blast case might easily be framed [1] so as to cover every application of the principle involved, and yet to describe a tangible apparatus, — thus escaping the imputation of being a claim to a principle. It would be for "the use of a hot blast by interposing a receptacle for heating the blast between the outside air and the furnace air." Whereas, in the Morse case, the claim, substantially, was for every mode of recording intelligible signs at a distance from the operator by the use of electro-magnetism. Here no tangible device, contrivance, or apparatus is indicated. There is, therefore, some ground for saying that the one claim is for the application of a principle, *in other words, for a process*, and that the other is for a naked principle.

211. In considering this famous eighth claim, and the decision of the court in regard to it, we are therefore, it would seem, brought face to face with the doctrine propounded by Mr. Justice Nelson; namely, that he who discovers the application of a principle, as in the Morse case, *a fortiori*, he who discovers the principle itself, as in the lead-pipe and hot-blast cases, is entitled to a patent covering every application of the principle in question to the end proposed.

212. We must conclude either that the eighth claim of Morse's patent was rejected because by its terms it included all possible improvements of the application described by him, — in other words, because it was wrongly worded, — or else because it included every application of the principle involved to the end sought, whatever the particular process used.

[1] In the actual case there was no "claim," it not being required by the English practice.

The Tilghman Cases.

213. In a recent case, the last important one upon the subject, the Supreme Court have found a way, not out of, but around, this difficulty, by considering patents based upon a principle simply as patents for a process, according to the point of view mentioned in the beginning of this discussion. And they held that a process is an intellectual conception, and therefore that it may be infringed, although a contrivance or apparatus different from that described by the patentee is used by the infringer.

214. They said, also, that the eighth claim of Morse, instead of describing a process, merely stated a principle, and the possibility of applying it to a certain object, and, therefore, they said, it was held invalid. From this reasoning it follows that a patent based upon a principle will cover every application thereof only when the claim and specification describe a *process*, independent of the particular apparatus, which every application of the principle must infringe.

215. Before setting forth this case, and that upon the same patent which preceded it, we quote from the opinion, delivered by Mr. Justice Bradley, the following remarks upon the hot-blast case and upon the Morse case: —

"That Neilson's patent was regarded as for a process is apparent from what is said by the judges who had it under consideration. Thus, Baron Parke at the trial had said: —

"'The specification and patent together make it clear what the discovery was: it was the introduction of hot air, by means of heating it before it was introduced into the furnace, between the blowing apparatus and the furnace.' Web. P. C. 275, 312.

"And when the matter came before the House of Lords, Lord Campbell said: 'After the construction first put upon it [the patent] by the learned judges of the Court of Exchequer, sanctioned by the high authority of my noble and learned friend now upon the woolsack, when presiding in the Court of Chancery, I think the patent must be taken to extend to all machines of whatever construction, whereby the air is heated intermediately between the blowing apparatus and the blast furnace. That being so, the learned judge was perfectly justified in telling the jury that it was unnecessary for them to compare one apparatus with another, because, confessedly, that system of conduit pipes was a mode of heating air by an intermediate vessel between the

blowing apparatus and the blast furnace, and therefore it was an infraction of the patent.' Id. 715.

"This case of the hot blast was commented upon in the great case of O'Reilly *v.* Morse, and is there recognized and approved in the opinion of this court, delivered by Chief Justice Taney. After quoting the remarks of Baron Parke in the Court of Exchequer, cited above, the Chief Justice says: 'We see nothing in this opinion differing in any degree from the familiar principles of law applicable to patent cases. Neilson claimed no particular mode of constructing the receptacle or of heating it. He pointed out the manner in which it *might* be done; but admitted that it might also be done in a variety of ways, and at a higher or lower temperature; and that all of them would produce the effect in a greater or less degree, provided the air was heated by passing through a heated receptacle. Whoever, therefore, used this method of throwing hot air into the furnace used the process he had invented, and thereby infringed his patent, although the form of the receptacle or the mechanical arrangements for heating it might be different from those described by the patentee. For whatever form was adopted for the receptacle, or whatever mechanical arrangements were made for heating it, the effect would be produced in a greater or less degree, if the heated receptacle was placed between the blower and the furnace, and the current of air passed through it. The patent was supported because he [Neilson] had invented a mechanical apparatus by which a current of hot air, instead of cold, could be thrown in. And this new method was protected by the patent.[1] The interposition of a heated receptacle in any form was the novelty he invented.' 15 How. 62, 115, 116.

"We have quoted these remarks of the Chief Justice more fully, because they show most clearly that he put the same construction upon Neilson's patent that was put upon it by Lord Campbell, and that he fully acquiesced in the legality and validity of a patent for a process. Yet it has been supposed that the decision in O'Reilly *v.* Morse was adverse to patents for mere processes. The mistake has undoubtedly arisen from confounding a patent for a process with a patent for a mere principle. We think that a careful examination of the judgment in that case will show that nothing adverse to patents for processes is contained in it.

[1] The statements in this and the preceding sentence are ingeniously incorrect. First, a mechanical apparatus, and then a method, are said to have been the subject of invention. In truth, Neilson invented no mechanical apparatus, — he described one; but if his patent had been restricted to that, it would have been worthless. He described a method, based upon a discovery. His patent was for the method (or process), and it was construed so as to be commensurate with the discovery.

"The eighth claim of Morse's patent was held to be invalid, because it was regarded by the court as being not for a process, but for a mere principle. It amounted to this, namely, a claim of the exclusive right to the use of electro-magnetism as a motive power for making intelligible marks at a distance; that is, a claim to the exclusive use of one of the powers of nature for a particular purpose. It was not a claim of any particular machinery, nor a claim of any particular process for utilizing the power, but a claim of the power itself, — a claim put forward on the ground that the patentee was the first to discover that it could be thus employed. This claim, the court held, could not be sustained.

"That this was the true ground of the decision will be manifest from the following observations of the Chief Justice in the opinion already quoted from. He says: 'He [Morse] claims the exclusive right to every improvement where the motive power is the electric or galvanic current, and the result is the marking or printing intelligible characters, signs, or letters at a distance,' &c. [quoted *supra*, at pp. 544, 545]. 'Whoever discovers that a certain useful result will be produced in any art, machine, manufacture, or composition of matter, by the use of certain means, is entitled to a patent for it, provided he specifies the means he uses in a manner so full and exact that any one skilled in the science to which it appertains can, by using the means he specifies, without any addition to or subtraction from them, produce precisely the result he describes. And if this cannot be done by the means he describes, the patent is void; and if it can be done, then the patent confers on him the exclusive right to use the means he specifies to produce the result or effect he describes, and nothing more. And it makes no difference in this respect whether the effect is produced by chemical agency or combination; or by the application of discoveries or principles in natural philosophy, known or unknown, before his invention; or by machinery acting altogether upon mechanical principles. In either case, he must describe *the manner or process* as above mentioned, and the end it accomplishes. And any one may lawfully accomplish the same end without infringing the patent, if he uses means substantially different from those described.' Id. 119. It seems to us that this clear and exact summary of the law affords the key to almost every case that can arise. 'Whoever discovers that a certain useful result will be produced in any art by the use of certain means is entitled to a patent for it, provided he specifies the means.' But everything turns on the force and meaning of the word 'means.' It is very certain that the means need not be a machine or an apparatus; it may, as the court says, be a *process*. A machine is a thing. A process is an act or a mode of acting. The one is visible to the eye, an object of perpetual observation. The other is a conception of the mind, seen only by its effects

when being executed or performed. Either may be the means of producing a useful result. The mixing of certain substances together, or the heating of a substance to a certain temperature, is a process. If the mode of doing it, or the apparatus in or by which it may be done, is sufficiently obvious to suggest itself to a person skilled in the particular art, it is enough, in the patent, to point out the process to be performed, without giving supererogatory directions as to the apparatus or method to be employed. If the mode of applying the process is not obvious, then a description of a particular mode by which it may be applied is sufficient. There is, then, a description of the process and of one practical mode in which it may be applied. Perhaps the process is susceptible of being applied in many modes and by the use of many forms of apparatus. The inventor is not bound to describe them all in order to secure to himself the exclusive right to the process, if he is really its inventor or discoverer; but he must describe some particular mode or some apparatus, by which the process can be applied with at least some beneficial result, in order to show that it is capable of being exhibited and performed in actual experience."

This long quotation is from the opinion of the court in the case of Tilghman *v.* Proctor (102 U. S. 717); but this suit was preceded by another upon the same patent, being the case of Mitchell *v.* Tilghman (19 Wall. 287).

216. The patent was for a process of separating fatty bodies into their component parts, — fat acids and glycerine, — by subjecting them, in a close vessel, to the action of highly heated water under a pressure that will prevent its conversion into steam. It was known before Tilghman's discovery that the elements of neutral fat require to be united with an atomic equivalent of water in order to separate from each other and to become free. This principle, therefore, was known. But Tilghman discovered that the separation might be accomplished by the action of highly heated water under the conditions above mentioned. This principle or capacity of highly heated water he employed (caused to operate), in order to allow the other principle to come into play. He described fully the apparatus by which this discovery of the property of highly heated water was made use of. Before Tilghman's discovery, the disintegration of fat by union with water was brought about by either of two processes, — one of lime saponification, the other of distillation. They were both more costly and less efficient than Tilghman's process.

217. In this suit, the defendants made use of the principle discovered by Tilghman, namely, the action of highly heated water; but their apparatus differed from his; and the court, as in the first of the lead-pipe cases, construed his patent to be for the precise apparatus described by the patentee, and they held that Tilghman was not the first to discover the principle upon which his patent was based.

218. Recently, however, as we have seen, this patent has been before the Supreme Court again, when the former decision was reversed.[1]

Tilghman's claim was: —

"The manufacturing of fat acids and glycerine from fatty bodies by the action of water at a high temperature and pressure."

This claim, the court held in the second case, should be compared with the specification, and thus construed to be for

"the process of subjecting to a high degree of heat a mixture, continually kept up, of nearly equal quantities of fat and water, in a convenient vessel strong enough to resist the effort of the mixture to convert itself into steam."

They added: —

"This is most certainly a process."

And they held that any apparatus employed to carry out this process would be an infringement of the patent.

219. We have already quoted the principles of law laid down in the opinion, which continued as follows: —

"Let us apply these principles to the present case. In the first place, the claim of the patent is not for a mere principle. The chemical principle or scientific fact upon which it is founded is that the elements of neutral fat require to be severally united with an atomic equivalent of water in order to separate from each other and become free. This chemical fact was not discovered by Tilghman.[2] He only claims to have invented a particular mode of bringing about the desired chemical union between the fatty elements and water. He does not claim every mode of accomplishing this result. He does not claim the lime-

[1] Tilghman *v.* Proctor, 102 U. S. 717.

[2] This, of course, is true; but it is equally true that there was another principle concerned, — namely, the capacity of water, under certain conditions, to disintegrate fat.

This principle Tilghman did discover, as we have already remarked.

saponification process, nor the sulphuric-acid distillation process; and if, as contended, the result was accomplished by Dubrunfaut, Wilson, and Scharling, by means of steam distillation, he does not claim that process. He only claims the process of subjecting to a high degree of heat a mixture, continually kept up, of nearly equal quantities of fat and water, in a convenient vessel strong enough to resist the effort of the mixture to convert itself into steam. This is most certainly a process. It is clearly pointed out in the specification, and one particular mode of applying it and carrying it into effect is described in detail. But it is not the particular apparatus described which Tilghman desires to secure by his patent. Having pointed out the process and suggested a particular mode of applying it, he claims as his invention 'the manufacturing of fat acids and glycerine from fatty bodies by the action of water at a high temperature and pressure.'

"The true construction of this claim is to be sought by comparing it, as we have already done, with the context of the specification, with the statement of the patentee that his 'invention consists of a process for producing free fat acids and solution of glycerine from those fatty and oily bodies of animal and vegetable origin which contain glycerine as a base;' that 'for this purpose he subjects these fatty and oily bodies to the action of water at a high temperature and pressure, so as to cause the elements of those bodies to combine with water and thereby obtain at the same time free fat acids and solution of glycerine;' that 'he mixes the fatty body to be operated upon with from a third to a half of its bulk of water, and the mixture may be placed in any convenient vessel in which it can be heated to the melting point of lead' [which is afterwards explained to be only desirable for a quick result, not essential]; that 'the vessel must be closed, and of great strength, so that the requisite amount of pressure may be applied to prevent the conversion of the water into steam.' This is the process which the patentee claims to have invented; and this description of it gives the proper construction and qualification to the claim."

The Morse Patent and the Tilghman Patent compared.

220. At first sight, the claims of Morse and Tilghman are similar. Thus, both state a result to be reached and an agent to be employed. In one, the result is telegraphing, and the agent electro-magnetism; in the other, the result is the disintegration of fat, and the agent is water at a high temperature and under pressure. Tilghman's claim, however, was supported, because by reference to the specification it was qualified so as to be a claim

for a process, the gist of which is the action of highly heated water under pressure, in a strong and close vessel, upon fat, in order to disintegrate it; and the patent was held to cover any apparatus by which this process could be carried out.

221. But Morse's claim, even by reference to his specification, cannot thus be limited. He expressly disclaims all the machinery by which the electro-magnetism covered by his patent is to operate, and the patent states no conditions under which, though by the use of different machinery, it might operate. It says simply that electro-magnetism is the means, and telegraphing the end.

222. Tilghman's patent was construed to claim the action upon fat of highly heated water under pressure, in a strong and closed vessel; and this was held to be a process. But Morse claimed the use of electro-magnetism for telegraphing. This was held to be a claim not for a process but for a principle.[1]

The Rule established by the Supreme Court.

223. The rule, therefore, now established by the Supreme Court is, that the scope of a patent based upon a principle, or upon the application thereof, is determined by the process that it describes. In other words, the patent will cover every application of the principle that involves the use of the process described and claimed by the patentee. By process is here meant not the particular apparatus or contrivance described by the patentee, but the mode of operation, the intellectual conception which is carried out by means of the contrivance or apparatus. It is necessary, however, that the patentee should describe one form of contrivance or apparatus (though it need not, and probably will not, be the best possible for the purpose), in order to prove the practicability of the process, and to enable others to employ it.

224. But a claim to every application of a principle — *i. e.* a force of nature or property of matter, to effect a certain object, irrespective of the process or method of application — will not be held valid, even though the patentee has discovered the existence of the principle.

[1] A similar distinction between the patent of Morse and the patent of Neilson has already been pointed out, *ante*, page 547.

225. This last point, that the discoverer of a *new principle* is entitled not necessarily to every application of it, but only to the process that he has based upon it, has not directly been decided, for it has not arisen; but it is included, as we have seen, by the doctrine and by the terms of this last decision. The point, however, as we say, has not arisen in the Supreme Court, unless in the unsatisfactory case of Le Roy *v.* Tatham; for in O'Reilly *v.* Morse, as we have remarked before, not a principle, but only its application, was discovered; and in Tilghman *v.* Proctor a principle, indeed, was discovered, but the process of the defendant in that suit infringed Tilghman's process, — in other words, was an application substantially the same as his, — so that it was not necessary to decide whether a different application of his principle to effect the same purpose would also have been covered by his patent. And even if there could not be an application of Tilghman's principle which did not include the gist of his process, still the contingency is one which may and will arise in other cases. It is provided for by the reasoning and by the *dicta* of the decision in Tilghman *v.* Proctor in a manner adverse to the patentee.

The Problem Theory.

226. The matter may be regarded from a slightly different point of view. The difference between a principle and the application of a principle has been said to be the same as that between the statement of a problem and the solution of it. A man may patent his solution of the problem, but not the problem itself. Thus, in the Morse case, the problem upon which others as well as Morse had been at work was to telegraph by the use of electricity. Morse was entitled to patent his solution of the problem, *i. e.* the method of telegraphing which he devised. He was not entitled to patent the problem itself, *i. e.* telegraphing by electricity, as he attempted to do in his eighth claim.

227. In the hot-blast case it must be considered that the problem was to promote ignition of fuel by means of a hot blast (the fact that Neilson discovered the truth that a hot blast would have this effect being set aside), and Neilson's solution of the problem was to interpose a heated receptacle between the air blast and the furnace. If it so happens that Neilson's solution of the problem was the only possible solution, that result is

merely an accident of the particular case, and does not affect the general rule.

228. The difficulty, however, of applying this rule of the problem and its solution to the hot-blast case will have been apparent to the reader. The fact is that in this case, and in most cases where a new principle is found out, the patentee has discovered the problem itself as well as its solution. There was no problem in regard to iron furnaces until Neilson discovered that a hot blast was better than a cold blast therefor. And when he had made that discovery, he had also solved the problem; for the evidence in the case was that, given the principle, any mechanic would have been able to apply it; given the problem, in other words, its solution was obvious.

229. It might, indeed, be said that in this case the true problem was to improve the action of an iron furnace; and Neilson's solution of it was the method which he described of utilizing the discovery made by him. But this application of the problem theory is too intricate and too strained to require any discussion.

230. That theory would seem to be available only when the principle concerned is known, and the possibility of applying it to a certain end has been conceived of. Then, indeed, there is a problem to be solved; and he who succeeds in applying the principle to the end sought has solved the problem, and he is entitled to a patent for his solution, and to that only. Whether or not his solution be the only possible one is a matter which should not be considered in construing his patent. This was the Morse case.

231. There are two cases in which the problem rule does not apply at all, as follows: —

(1.) Where the patentee has discovered the principle itself. Instance, the hot-blast case and the lead-pipe case.

(2.) Where, the principle being known, he has been the first to *conceive the possibility* of applying it to a certain end, as well as the first to devise a successful means of application. Here, again, the patentee has discovered the problem as well as its solution.

232. There is another case in which the problem rule may be applied, but in which its fairness is not so clear as it is in the case first considered. It is as follows: Given a principle and the problem of applying it to a certain end, suppose the patentee

to have discovered some fact unknown before as to the nature of the principle, which enables him to apply it to the end contemplated. In such a case the patentee has solved an existing problem; but the solution did not become possible until a discovery had been made.

Difference between Discovering a Principle and Inventing the Application of a Known Principle.

233. It seems to us that the true distinction is that between the discovery of some principle, or of a fact in regard to the nature of a principle, and the invention of some means to apply a known principle. It is, however, we are bound to admit, a distinction which has not, in terms, been taken by the courts. Mr. Justice Nelson, indeed, as we have seen, said that he who has discovered the application of a principle, *a fortiori*, he who has discovered the principle itself, is entitled to a patent covering every application that can be made for the same object. But this is the only suggestion of a difference in the two cases. In the hot-blast case, Baron Parke said, as the reader will remember, "We think the case must be considered as if, the principle being well known, the plaintiff had first invented *a mode of applying it*."

234. And yet it would seem, upon the fundamental rule that a patent should be commensurate with the invention or discovery on account of which it is granted, that he who discovers a new principle and applies it to a particular purpose should have a patent covering every application of that principle to that purpose;[1] and so perhaps of him who has made a discovery in regard to the nature of a known principle, by reason of which discovery a new application of the principle becomes possible: whereas he who has invented an application of a known principle is entitled to a patent for such application only, including, of course, substantial equivalents therefor and colorable imitations thereof.

235. A similar rule in regard to machines is established. The

[1] Of course, a better application, subsequently made by another inventor, might be a patentable improvement upon the application described by the patentee. Nevertheless, the use of such patentable improvement would be an infringement of the original patent, for it is based upon the discovery described in the original patent.

courts discriminate between the invention of a new kind of machine, a new *genus*, and the invention of an improvement upon a machine, a new species; and they hold that the patent for a machine generically new has a scope wider than that for a machine new only as a species.

In the case of McCormick *v.* Talcott (20 How. p. 405), Mr. Justice Grier said: —

"If he [the patentee] be the original inventor of the device or machine called the divider, he will have a right to treat as infringers all who make dividers operating on the same principle and performing the same functions by analogous means or equivalent combinations, even though the infringing machine may be an improvement of the original, and patentable as such. But if the invention claimed be itself but an improvement on a known machine by a mere change of form or combination of parts, the patentee cannot treat another as an infringer who has improved the original machine by use of a different form or combination performing the same functions. The inventor of the first improvement cannot invoke the doctrine of equivalents to suppress all other improvements which are not mere colorable invasions of the first."

To the same effect, Mr. Justice Bradley, in Railroad Co. *v.* Sayles, 97 U. S. p. 556.

236. We may adduce, also, the analogous rule, according to which the patent for a new product is held to include any product substantially the same, although produced by a process entirely different.

237. On any theory other than that for which we contend, the more meritorious patentee who has discovered the principle as well as its application gets a patent no broader than that of him who has discovered only the application of a familiar principle. Thus, to take the Morse case, according to the theory which obtains, the inventor, if he had revealed electro-magnetism to the world as well as shown how it might be used for telegraphing, could have had no broader patent than if, as was the case, he had merely applied a force already known to the same purpose.

238. However, we will not presume further to argue the soundness of a distinction which has so little support from authority; though we cannot refrain from pointing out the fact that, if not provided for by the reasoning, it is in entire harmony with the decisions, of the leading cases which we have considered.

This distinction, also, invalidates the famous eighth claim of the Morse patent without recourse to those refinements which, upon the doctrines of Neilson *v.* Harford and Tilghman *v.* Proctor, are, as we have seen, necessary to withdraw it from its analogy to the patents upheld in those cases.

M'CLURG *v.* KINGSLAND, 1 How. 202 (1843).

Harley's patent for an improvement in the mode of casting chilled rollers and other metallic cylinders and cones.

In casting iron rolls it is important that the surface should be free from impurities. Harley discovered that if the tubes or "gates" through which the melted iron entered the mould were so placed that the melted iron should enter substantially at a tangent to the cylinder, the molten iron would thereby receive the rotating motion of a whirlpool, whereby its heavier and better parts would go to the exterior, and the dross and lighter parts be kept at the centre.[1]

"This," said the court, "was the thing patented, consisting solely in changing the direction of the tube which conveyed the metal to the mould from a horizontal or perpendicular position to an angular one. It produced the desired effect, and was highly useful.

"The novelty of the invention was much contested at the trial; but as the case turned on other points, that became an immaterial question; as the case comes before us on exceptions to the charge of the court, which assumed that Harley was the original and true inventor of the improvement, and put the case to the jury on the following facts, which were in full proof, in nowise contradicted and admitted to be true."

These facts raised two questions; namely, first, Were the defendants licensed to use the invention? second, Was the patent void by reason of public use of the invention before the patent was applied for?

The *patentability* of the invention, therefore, seems to have been contested neither here nor at the trial below.

[1] *Vide* page 42, *ante*, for another description of the invention.

PARKER *v.* HULME, 1 Fish. 44.

E. D. of Penn., 1849. Kane, J., and a Jury.

Z. & A. Parker's patent, dated Oct. 19, 1829, for an improvement in water-wheels.

The importance of this invention, and the valuable remarks of the court upon it, compel us to set out the case at some length.

We quote from the report: —

"The patentees, in the year 1827, by observing in a horizonal reaction wheel with a fixed flume the operation of a simple stationary guide, discovered — and by removing and replacing the guide tested — the utility of applying as a motive power the pressure or centrifugal force of water made to revolve within such a wheel, and to pass into and act upon its circumferential buckets with a circular or vortical motion, coinciding with that of their revolution.

"In the following year they experimented with both horizontal and vertical reaction wheels, by various adaptations of fixed guides, so formed and adjusted as to produce, maintain, and regulate the proper circular currents, and give to them the required direction within the buckets. The vertical wheels were arranged in pairs, and the fixtures were so adapted that in several particulars a single stationary piece of machinery served for two wheels. The patentees, in the prefatory part of their specification, declare that their invention consists of 'a new and useful improvement in the application of hydraulic power, by a method of combining percussion[1] with reaction, applied and exemplified in: 1. A compound, vertical, percussion, and reaction water-wheel for saw-mills and other purposes, with the method of applying water on the same; 2. An improved horizontal, reaction water-wheel, with the method of combining percussion with reaction on it; 3. A method of combining percussion with reaction on common reaction wheels, or those already in use.' It is then stated that the *principle* upon which this improvement is founded is that of producing a vortex within reaction wheels, which by its centrifugal force powerfully accelerates the velocity of the wheel, and adds, proportionally, to its momentum."

The only claim in question in this case ran as follows: —

"The compound, vertical, percussion, and reaction wheel for saw-mills and other purposes, with two, four, six, or more wheels, on one

[1] Percussion is thus described in Wintermute *v.* Redington, *post*, page 563: —

"A power over and above reaction, derived from the impingement of the water, with a momentum due to its velocity, upon the buckets placed obliquely in its line of motion."

horizontal shaft. The concentric cylinders enclosing the shaft, and the manner of supporting them. The spouts which conduct the water into the wheels from the penstock, with their spiral termination between the cylinders."

Upon the specification and claim the court remarked as follows: —

"Did they [the patentees] mean to assert, 1, That they were the first to discover and to avail themselves practically, by mechanism, of the effect of vortical motion, imparted to water in a reaction wheel, and operating by its centrifugal force to accelerate the wheel's velocity; or, 2 (not so expanding their supposed discovery), That they were the first to devise and avail themselves, practically, of certain mechanical arrangements, which they have described in their specification, and which exemplify and apply the accelerating effect of this motion; or, 3, That they were the first to do both of these? And then as to the mechanical arrangements which they describe, did they mean to assert, 1, That they were the first to devise and apply the combination of them to the particular object; or, 2, That they were the first to devise and apply them separately, in furtherance of that object; or, 3, That they were the first to devise and apply as well the elements of the combination as the combination itself, for the object proposed? These are questions, some of them at least, of great nicety and great interest, and on which, if the opinion now to be expressed were in its consequences final, I should desire time for further consideration after appropriate argument. [Upon a subsequent motion for a new trial, the jury having found for the plaintiff, the judge intimated that he no longer doubted as to the interpretation of the patent; and the motion was not pressed.] But for the purposes of the occasion I feel at liberty to instruct you that the patentees claim, in their specification, to have been the first to discover, devise, and apply to use, 1, The propulsive effect of vortical motion of water in a reaction wheel operating by its centrifugal force, and so directed by mechanism as to operate in the appropriate direction; and, 2, The mechanical arrangements for making, guiding, and controlling this vortical motion, as set forth in their specification, both as new mechanical devices, considered separately, in their application to these objects, and as new in their combination, to produce and effectuate or perfect the same objects. . . .

"As to the mechanical arrangements and devices, separately or in combination, there is no question that they were patentable. In regard to the arrangement of vertical wheels in pairs, on a horizontal shaft, the mere fact that this was a duplication of the single wheel does not of itself alone invalidate the patent. Duplication producing