POTTS *v.* CREAGER.

APPEAL FROM THE CIRCUIT COURT OF THE UNITED STATES FOR THE SOUTHERN DISTRICT OF OHIO.

No. 94. Argued November 23, 1894. — Decided January 7, 1895.

The machine patented to Clayton Potts and Albert Potts by letters patent No. 322,393, issued July 14, 1885, for a new and useful improvement in clay disintegrators, and the machine patented to them by letters patent No. 368,898, issued August 23, 1887, for an improvement upon the prior patent, contained new and useful inventions, and the letters patent therefor are valid, and are infringed by the machines manufactured and sold by the defendants in error.

The cases treating of letters patent for new applications of old devices considered, and as a result of the authorities, it is *held* that, if the new use be so nearly analogous to the former one, that the applicability of the device to its new use would occur to a person of ordinary mechanical skill, it is only a case of double use; but if the relations between them be remote, and especially if the use of the old device produce a new result, it *may* involve an exercise of the inventive faculty — much depending upon the nature of the changes required to adapt the device to its new use.

This was a bill in equity by C. & A. Potts & Co., an Indiana corporation, against the firm of Jonathan Creager's Sons, of Cincinnati, for the infringement of patent No. 322,393, issued July 14, 1885, to Clayton Potts and Albert Potts for a clay disintegrator; and also of patent No. 368,898, issued August 23, 1887, to the same inventors for an improvement upon the prior patent. A third patent to George Potts, No. 384,278, was originally included in the bill, but by stipulation between the parties all reference to this patent was cancelled, and the bill treated as if formally amended by alleging infringement of the first two patents only.

In the first patent, No. 322,393, the patentees stated the object of their invention to be "to disintegrate the clay by means of a revolving cylinder, which shall remove successive portions from a mass of clay which is automatically pressed against the cylinder."

This was accomplished by a cylinder containing a series of steel bars, fitted into longitudinal grooves in the periphery of

the cylinder, where they were secured by flush screws at each end, by means of which they were adjusted, so as to present a sharp corner, projecting above the surface of the cylinder. Opposite the cylinder was a strong vibratory plate mounted on a shaft, so as to swing in its bearings, by the aid of an eccentric wheel. The opposed sides of the cylinder and the upper and central portions of the plate formed a trough, one side of which approached and receded from the other at intervals, and which had at the bottom a narrow opening of constant width. In the operation of the machine, the plate was swung back, so as to leave as large an opening as possible, and the moist untempered clay was thrown into the trough between the cylinder and the upper portion of the plate. By a rapid revolution of the cylinder, successive portions of the clay were removed from the mass, carried through the narrow opening by means of the scraping bars, and at the same time the upper portion of the plate moved slowly toward the cylinder, thus keeping the mass of clay in close contact with the cylinder, as successive portions were removed.

The only claim alleged to be infringed was the sixth, which reads as follows:

"6. In a clay disintegrator, the combination with cylinder A, having a series of longitudinal grooves, of the scraping bar *c*, and adjustably secured in said grooves for the purpose specified."

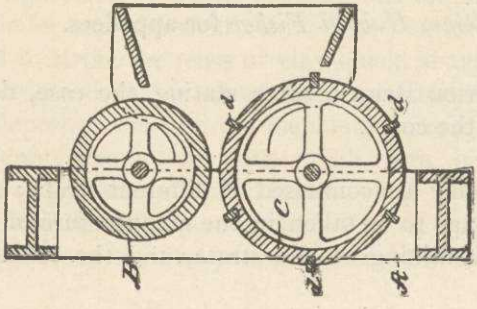
In the second patent, No. 368,898, which was for an improvement upon the first, there was substituted in lieu of the swinging plate, shown by the first patent, as coöperating with the revolving cylinder, a plain cylinder set opposite the cutting cylinder, and revolving therewith in close proximity, so that the raw clay might be fed, shredded, and discharged in an even and continuous manner, in readiness to be taken directly to the pug or other mill. The patentees further stated in their specification:

"The machine shown in our letters patent No. 322,393 was provided with a swinging or vibrating plate to coact with the cutting cylinder in effecting the shredding of the clay which was fed between them. In such machine the abutting surface

of the vibrating plate furnished a rest or bearing for the clay in presenting the same to the action of the cutter knives. This abutting surface was limited in extent and unchanging in position, so that it became rapidly worn. By substituting the revolving roll for the vibrating plate, this objection is greatly lessened. The roll constantly presents new surfaces to the cutters, so that the wear is even and regular throughout its circuit. If any inequalities exist in the roll at the outset these become rapidly reduced, so that by use the cylinder wears more and more true, and acts thus with constantly better effect. Aside from cheapness in construction, the revolving roller or cylinder machine will work wet or sticky clays with perhaps one-third of the power necessary in treating such clays in the vibratory-plate machine. Such plate tends constantly to crowd or squeeze the passing clays, whereas the revolving roll yields continuously, so that clogging is less apt to occur at the same time that the clay is finely and evenly shredded, the cutter cylinder moving, by preference, more rapidly than the companion feed-roll in order to accomplish this effect.

"Prior to our invention it has been very common to employ in clay mills, sugar mills, and the like a set of rolls between which the material passed as the rolls were revolved; but in such machines the operation of the rolls was merely to break up the clogs of clay and squeeze or crush the same, whereas, by our invention the clay is positively cut into fine shreds or clippings in much better condition to be tempered and moulded than by the old forms of disintegrating machines."

The following drawing illustrates the main features of the machine, so far as the same are material to the present case:



Defendants were charged with infringing the first and second claims of this patent, which read as follows:

"1. In the supporting frame of a clay disintegrator, a rotating cylinder longitudinally grooved and carrying cutting bars in and projecting beyond the grooves, in combination with a smooth-faced rotating cylinder adapted to carry and hold the clay against the cylinder having the cutting bars thereon, which latter cut or shred the clay and pass the same between the cylinders, substantially as set forth.

"2. In clay disintegrators, the combination with the main supporting frame and with a rotating cylinder fixed therein and having longitudinal cutting bars projecting beyond the face thereof, of a positively-revolving companion cylinder fixed opposite thereto in said frame and having a smooth face or surface, with which said cutting bars directly coöperate to shred or clip the clay as the same is fed by and passed between said cylinders, substantially as described."

The answer denied any patentable novelty in these patents, in view of the prior art as shown by numerous earlier patents, to which reference was made; and also denied infringement, alleging that defendants were manufacturing clay pulverizers under authority of patents granted to Jonathan and Harry M. Creager in 1888.

The case came on for hearing upon pleadings and proofs, and the court directed a decree dismissing the bill. 44 Fed. Rep. 680. From this decree plaintiff appealed to this court.

Mr. Chester Bradford and *Mr. Ernest W. Bradford* for appellants.

Mr. William Hubbell Fisher for appellees.

Mr. Justice Brown, after stating the case, delivered the opinion of the court.

Beds of clay are composed of different strata; and the first step necessary to be taken in the manufacture of such clay is a thorough mixing of the strata, and the reduction of the

clay to a suitable condition. Otherwise, the product will contain laminations, will shrink unevenly and check in burning, scale or peel off in use, and be less valuable than products made of clays which are first thoroughly mixed and tempered, and reduced to a homogeneous mass before being manufactured into the product. Prior to the Potts inventions various methods seem to have been employed to secure this result. The clay had been sometimes spaded up in the autumn, subjected to the action of the frost during the winter, and then to the operation of the old-fashioned grinding pit. A mud-wheel had also been used. The "soak pit" was another means used to accomplish the same result — the clay being deposited in a pit of water and allowed to remain until the soaking process had reduced it to the desired condition. These methods were slow and expensive. Both grinding machines and crushing rolls had been adopted in comparatively recent years. Their action was simply to crush the clay, the different strata being pressed together and made more compact, and the clay discharged from the rolls in cakes or sheets, a condition that made the tempering very difficult, as the clay thus treated would not readily receive or absorb the water.

The object of the Potts inventions was not to crush the clay, as had been previously done, but to disintegrate and pulverize it, leaving it in a loose condition, fitted to absorb the water readily. Their machines consisted substantially of a cylinder moving at a high speed, having longitudinal bars fixed in its periphery with sharp projecting corners, and a fixed abutment in close proximity thereto — in the first patent a swinging plate — in the second a smooth cylinder — and a positive feeding device by which the clay was forced between the main cylinder and the abutment. The longitudinal bars thus operated to strike the mass of clay quick, sharp blows in rapid succession, and cut or shred small portions therefrom, which were deposited beneath the machine, thoroughly mixed in their different strata, and with rough, torn, or ruptured edges — a condition best adapted to receive or absorb water, and be easily and thoroughly tempered.

The only feature of the first patent material to be considered

is the cylinder described in the sixth claim as a cylinder "having a series of longitudinal grooves, of the scraping bars *c*, adjustably secured in said grooves, for the purpose specified."

This cylinder is alleged to have been anticipated in devices shown in eight prior patents, each of which will be briefly mentioned.

1. A patent of 1865, to Robert Butterworth, for an improvement in machines for grinding apples, exhibits a cylinder with cutting knives or blades on its periphery. These knives have serrated or toothed edges, which form chisel-shaped cutting projections, and are provided with means for adjustment so as to protrude more or less beyond the periphery of the cylinder. When the cylinder is rotated, the apples are cut or ground by the knives between the cylinder and a plate somewhat similar to the swinging plate of the first Potts patent, provided with springs adapted to throw the plate back, whenever any stones or hard foreign substances have passed through the machine. While these knives are set upon the periphery of the cylinder in much the same way as the scraping bars of the Potts patents, it is really the only point of resemblance between the two devices. The Butterworth patent could not possibly have been used as a clay disintegrator without changes which would involve more or less invention.

2. A patent granted in 1880, to one Ennis, exhibits a machine for preparing paper pulp, and consists of a revolving cylinder armed with longitudinal knives, and a stationary plate also armed with knives, mounted beneath it in close proximity thereto. Rags fed between the revolving and stationary knives are thus cut in pieces. The reasons given why the Butterworth patent does not anticipate the Potts inventions apply with equal force to this.

3. A patent granted in 1866 to one Frost exhibits another grinding cylinder for paper engines, and consists of a skeleton cylinder armed with sharp cutting blades, secured adjustably, so as to be moved out from the axis of the cylinder, as they wear. The cylinder is manifestly inapplicable to the disintegration of clay, and nothing besides the cylinder is shown.

4. A patent to one Van Name, granted in 1884, shows a roller for grinding mills, provided with blades arranged in longitudinal grooves around the surface parallel with the axis. These blades are made of hardened steel, and of soft iron, hardened paper or wood, placed alternately with the steel blades. The surface of the roller is practically smooth, except that in use, the soft material will wear more rapidly than the hard. This results in maintaining a corrugated roller until the strips are worn out. It can be of no possible service to the defendant in this connection.

5. The patent issued in 1869 to one Peabody for a cotton-seed huller also exhibits a rotary cylinder armed with knives set in grooves, each having a chisel-shaped cutting edge, and adjustable for the purpose of increasing or diminishing the cut. It is evidently not adapted to the working of clay.

6. The same remark may be made of the patent to Mayfield of 1871 for a grinding mill, such as are adapted for general use among farmers. It also consists of a cylinder provided with knives or plane bits set in longitudinal grooves. These knives are also adjustable.

7. A patent to J. W. Smith, granted in 1881, is for an apparatus for preparing wheat for grinding, in which a cylinder is employed similar to that of the Mayfield patent, with a series of plane bits projecting from the periphery. These plane bits are adjustably bolted by screws and slots within the cylinder, while their cutting edges protrude from slots outwardly from the rim of the cylinder. They do not differ in principle from the knives of Peabody and Mayfield.

8. A patent to one Rudy granted in 1875 for an improvement in clay pulverizers is the only one which is used in connection with the preparation or manufacture of clay, and consists of a pulverizing roller in combination with separate concave springs, or an elastic bed for supporting the clay while the roller revolves therein, after which it falls through a sieve and descends to a second cylinder, and then to a third. The patent does not describe distinctly how the rollers are made, but they would seem to be fluted, and cast in a series of sections. The process employed seems to have been rather

a grinding than a disintegrating process, and it would seem that such a machine would be inoperative except perhaps where the clay was dry and of light consistency. The cylinder evidently operates upon a wholly different principle from that of the Potts patents.

Other patents are shown bearing a greater or less resemblance to these, but generally used for wholly different purposes, such as for straw cutters, machines for pressing tobacco, pulp engines, peat machines, feed boxes for roller mills, and machines for removing hair from hides. So far as they are used for working clay, they would appear to differ radically in principle from the Potts patent. An exhibit much relied upon, known as the Creager Wood Polishing Machine, shows a cylinder, provided on its periphery with a series of projecting strips or bars of glass, not differing materially in form from plaintiffs' scrapers, and like them fitted into longitudinal grooves. The machine was used for polishing boards, which were run between the cylinder and a support and pressure roller journalled underneath, and connected with an automatic adjustable contrivance. Had this machine been used for an analogous purpose, it would evidently have been an anticipation of the Potts cylinder, since the substitution of steel for glass strips would not of itself have involved invention. This device was constructed in 1874, was used for only half an hour when by an accident several of the scrapers or polishers were broken, and before others could be moulded the building took fire and burned down. That it was not considered a success is evident from the fact that the machine was never reconstructed, but in 1878 Creager took out a patent for a similar machine, in which a *smooth* or corrugated roller of wood, glass, bone, ivory, or metal was the distinctive feature. In short, the machine of 1874 appears to have been merely an abandoned experiment.

As already stated, the second Potts patent is for the combination of the cylinder described in the first patent with another smooth-faced rotating cylinder, adapted to carry and hold the clay against the first cylinder, which cuts and shreds it as it passes between them. It seems that the swinging plate,

described in the first patent as coacting with the cutting cylinder in shredding the clay, was limited in the extent of its cutting surface, and was unchangeable in position, so that it became rapidly worn. To obviate this difficulty a revolving roller was substituted for the plate. As this roller constantly presented a new surface to the cutter, the wear was even and regular over its entire circumference. If any inequalities existed in the roller at the outset they became rapidly reduced, so that by use the cylinder constantly wears truer, and thus cuts with better effect. There was also an advantage in greater cheapness of construction, and in the ability of the roller to work in wet and sticky clays, with much less power than was necessary in treating such clays with the vibratory plate.

The employment of two parallel cylinders to coöperate in the performance of a certain task is so common and well known that the court may take judicial notice of such examples as are found in the ordinary clothes wringer, fluting rollers, straw cutters, printing presses, paper manufacturing machines, and grinding mills of various kinds. Indeed, this combination of two rollers had been before used for the purpose of grinding and crushing clay, as shown in a patent to Alexander, granted in 1872, wherein the clay was passed between double spiral-toothed grinding and crushing rollers, and then between plain, cylindrical rollers, and in the patent to Alsip and Drake of June 30, 1885, which exhibits a fluted or corrugated cylinder in combination with a smooth-faced companion cylinder, between which the clay is passed and crushed, though not disintegrated. In view of these devices it is too clear for argument that the Potts would not be entitled to a patent simply for passing the clay between two grinding or crushing cylinders, and it is at least open to doubt whether, in view of the first patent, there is any novelty in substituting a smooth-faced roller for the swinging plate of the first patent. But, as the sixth claim of the first patent covers only the cylinder, the second patent may be read in connection with it to show what the machine was as completed. The question whether the second patent was anticipated by the first is not presented by this record.

What, then, did the patentees do? They took the cylinder shown in the Creager wood-polishing exhibit, removed the glass bars, and substituted bars of steel; provided it with an abutting surface in the form of a revolving roller, and used it for a totally distinct and different purpose. Putting aside, for the purposes of this discussion, the fact that the Creager cylinder was an abandoned experiment, did this involve invention? Certainly, if this exhibit does not anticipate, none of the others do. The answer to this requires the consideration of the often-recurring question, which has taxed the ingenuity of courts ever since the passage of the patent acts, as to what invention really is. When a patented device is a mere improvement upon an existing machine, and the case is not complicated by other anticipating devices, the solution is ordinarily free from difficulty. But where the alleged novelty consists in transferring a device from one branch of industry to another, the answer depends upon a variety of considerations. In such cases we are bound to inquire into the remoteness of relationship of the two industries; what alterations were necessary to adapt the device to its new use, and what the value of such adaptation has been to the new industry. If the new use be analogous to the former one, the court will undoubtedly be disposed to construe the patent more strictly, and to require clearer proof of the exercise of the inventive faculty in adapting it to the new use — particularly if the device be one of minor importance in its new field of usefulness. On the other hand, if the transfer be to a branch of industry but remotely allied to the other, and the effect of such transfer has been to supersede other methods of doing the same work, the court will look with a less critical eye upon the means employed in making the transfer. Doubtless a patentee is entitled to every use of which his invention is susceptible, whether such use be known or unknown to him; but the person who has taken his device and, by improvements thereon, has adapted it to a different industry, may also draw to himself the quality of inventor. If, for instance, a person were to take a coffee-mill and patent it as a mill for grinding spices, the double use would be too manifest for seri-

ous argument. So, too, this court has denied invention to one who applied the principle of an ice-cream freezer to the preservation of fish. *Brown* v. *Piper*, 91 U. S. 37; to another who changed the proportions of a refrigerator in such manner as to utilize the descending instead of the ascending current of cold air, *Roberts* v. *Ryer*, 91 U. S. 150; to another who employed an old and well-known method of attaching car trucks to the forward truck of a locomotive engine, *Pennsylvania Railroad* v. *Locomotive Truck Co.*, 110 U. S. 490; and to still another who placed a dredging screw at the stem instead of the stern of a steamboat, *Atlantic Works* v. *Brady*, 107 U. S. 192. In *Tucker* v. *Spalding*, 13 Wall. 453, the patent covered the use of movable teeth in saws and saw plates. A prior patent exhibited cutters of the same general form as the saw teeth of the other patent, attachable to a circular disk, and removable as in the other, the purpose of which patent was for the cutting of tongues and grooves, mortices, etc. The court held that if what it actually did was in its nature the same as sawing, and its structure and action suggested to the mind of an ordinarily skilful mechanic this double use to which it could be adapted without material change, then such adaptation to a new use was not new invention, and was not patentable.

Upon the other hand, we have recently upheld a patent to one who took a torsional spring, such as had been previously used in clocks, doors, and other articles of domestic furniture, and applied it to telegraph instruments, the application being shown to be wholly new. *Western Electric Co.* v. *La Rue*, 139 U. S. 601. So, also, in *Crane* v. *Price*, Webster's Pat. Cas. 409, the use of anthracite coal in smelting iron ore was held to be a good invention, inasmuch as it produced a better article of iron at a less expense, although bituminous coal had been previously used for the same purpose. See also *Steiner* v. *Heald*, 6 Exch. 607.

Indeed, it often requires as acute a perception of the relation between cause and effect, and as much of the peculiar intuitive genius which is a characteristic of great inventors, to grasp the idea that a device used in one art may be made

available in another, as would be necessary to create the device *de novo*. And this is not the less true if, after the thing has been done, it appears to the ordinary mind so simple as to excite wonder that it was not thought of before. The apparent simplicity of a new device often leads an inexperienced person to think that it would have occurred to any one familiar with the subject; but the decisive answer is that with dozens and perhaps hundreds of others laboring in the same field, it had never occurred to any one before. The practised eye of an ordinary mechanic may be safely trusted to see what ought to be apparent to every one. As was said by Mr. Justice Bradley, in *Loom Company* v. *Higgins*, 105 U. S. 580, 591: "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."

As a result of the authorities upon this subject, it may be said that, if the new use be so nearly analogous to the former one, that the applicability of the device to its new use would occur to a person of ordinary mechanical skill, it is only a case of double use, but if the relations between them be remote, and especially if the use of the old device produce a new result, it *may* at least involve an exercise of the inventive faculty. Much, however, must still depend upon the nature of the changes required to adapt the device to its new use.

Applying this test to the case under consideration, it is manifest that, if the change from the glass bars of the Creager Wood Exhibit to the steel bars of the Potts cylinder was a mere change of material for the more perfect accomplishment of the same work, it would, within the familiar cases of *Hotchkiss* v. *Greenwood*, 11 How. 248; *Hicks* v. *Kelsey*, 18 Wall. 670; *Terhune* v. *Phillips*, 99 U. S. 592, and *Brown* v. *District of Columbia*, 130 U. S. 87, not involve invention. But not only did the glass bars prove so brittle in their use for polishing wood that they broke and were dis-

carded after a half an hour's trial, but they would undoubtedly have been wholly worthless for the new use for which the Potts required them. Not only did they discard the glass bars, and substitute others of steel, but they substituted them for a purpose wholly different from that for which they had been employed. Under such circumstances, we have repeatedly held that a change of material was invention. *Smith* v. *Goodyear Dental Vulcanite Co.*, 93 U. S. 486; *Goodyear Dental Vulcanite Co.* v. *Davis*, 102 U. S. 222. None of the cylinders to which our attention has been called resembled the Potts cylinder so closely as does this. None of them were used for the purpose of disintegrating, as distinguished from crushing or grinding clay. The result appears to have been a new and valuable one—so much so that, within a short time thereafter, defendants themselves obtained a patent upon a machine of their own to accomplish it. As we said in *Smith* v. *Goodyear Dental Vulcanite Co.*, 93 U. S. 486, and *Magowan* v. *New York Belting Co.*, 141 U. S. 332, 343, where the question of novelty is in doubt, the fact that the device has gone into general use, and displaced other devices employed for a similar purpose, is sufficient to turn the scale in favor of the invention. Our conclusion is that the patents in question are valid.

The question of infringement presents less difficulty. Defendants' machine, in its construction and operation, is substantially the same as plaintiffs'. Instead, however, of casting the shredding roller with a solid face, forming longitudinal grooves therein, and fixing the steel bars in the grooves, defendants cast the cylinder in the form of a skeleton or spider, the knives being respectively fastened to the several arms projecting from the hub, one knife to each arm, and forming the periphery by filling in metal plates between the knives. The cylinder, when its numerous parts are bolted together, is a perfect roll with a solid face, having cutting bars projecting from the slots or grooves thus formed, and adjustably secured therein by means of bolts passing through them. The operation is the same as that of the Potts machine, and it accomplishes practically the same result by practically the same means.

Defendants, in their trade circular advertising their own machine, state: "Unlike the ordinary roller process, the action of the disintegrator is to remove small portions, by cutting from the clay fed into the hopper on the same principle as shaving and whittling, and does not roll the clay into sheets, thus making it unfit for proper manipulation. The past season we have put out many of these machines in difficult clays, and made it an obligation to work the clay both wet and dry, and each machine has done its work well and to the entire satisfaction of the purchasers." This is a frank and apparently a just tribute to the merits of the plaintiffs' invention, as well as a distinct admission that their own machine accomplishes the same result.

The decree of the court below is, therefore,

Reversed and the case remanded for further proceedings in conformity with this opinion.

CAMPBELL *v.* HAVERHILL.

ERROR TO THE CIRCUIT COURT OF THE UNITED STATES FOR THE DISTRICT OF MASSACHUSETTS.

No. 87. Argued November 21, 22, 1894. — Decided January 7, 1895.

Where a party excepts to a ruling of the court, but, not standing upon his exception, elects to proceed with the trial, he thereby waives it.

The statutes of limitation of the several States apply to actions at law for the infringement of letters patent.

THIS was an action at law for the infringement of letters patent No. 42,920, issued May 24, 1864, to James Knibbs for an improvement in fire-engine pumps, of which patent plaintiffs were the assignees. The patent expired May 24, 1881. The action was begun May 20, 1887, in the name of Ruel Philbrook and several others, among whom was Christopher