Goldie machine, in that several cuts are taken across the spike point, instead of one. The action of the cutters is to cut obliquely in the direction of the length of the spike across the face of the anvil die, and prepare the spike to receive the action of the last one of the cutters, which passes so close to the shearing edges of the anvil die as to form the sharp cutting edges of the spike point by an operation similar to that of the Goldie machine. The defendants' rotary machine has the same anvil die, and its cutters are arranged to operate with relation thereto in exactly the same way as on the reciprocating machine. They must be classed in the same category. Oval Wood Dish Co. v. Sandy Creek, N. Y., Wood Mfg. Co., 60 Fed. 285. Each performs the same function, and produces the same result as the other, and both infringe the claims of the complainants' patent. For the reasons given above, the decree of the circuit court will be affirmed.

CHICAGO SUGAR-REFINING CO. v. CHARLES POPE GLUCOSE CO. et al.

(Circuit Court of Appeals, Seventh Circuit. February 4, 1898.)

No. 383.

1. PATENTS—PATENTABLE PROCESSES—MAKING STARCH FROM CORN.
The Behr patent, No. 247,152, for a process of treating corn in the manufacture of starch, glucose, etc., and consisting in the automatic and continuous separation of crushed corn into germs, hulls, and starch, by means of starch milk, itself continuously and automatically formed in the course of the operation, and being of such specific gravity as to cause the germs to rise to the top, so that they may be carried off through a chute, describes a patentable process, and was not anticipated by either the Anderson or Cavaye British patents of 1857 and 1872, respectively. 79 Fed. 957, reversed. Woods, Circuit Judge, dissenting.

2. SAME—MECHANICAL PATENT—VALIDITY AND INFRINGEMENT.
The Behr patent, No. 247,153, for an apparatus for carrying on his continuous process of separating from crushed corn the starch milk and germs, construed, and *held* not infringed as to the first claim, and void as to the fifth claim, for want of invention.
Wood, Circuit Judge, dissenting.

Appeal from the Circuit Court of the United States for the Northern Division of the Northern District of Illinois.

C. K. Offield and Robert N. Kenyon, for appellant.
L. L. Coburn, for appellees.

Before WOODS, JENKINS, and SHOWALTER, Circuit Judges.

SHOWALTER, Circuit Judge. The circuit court upon final hearing dismissed for want of equity a bill wherein this appellant charged infringement by appellees of the one claim of letters patent of the United States No. 247,152, and the first and fifth claims of letters patent of the United States No. 247,153. These patents were issued in 1881 to Arno Behr. They became later the property of

this appellant, by assignment. This appeal is taken from the decree of dismissal.

If grains of corn be dropped into a basin of water, they will sink, and lie on the bottom of the basin. If grains of corn be crushed, so that the germ of each is separated from the hull, and if the broken grains be then sifted, so that all loosened or liberated particles of the flour or starchy matter are removed, and the remainder dropped into a vat or basin containing water, both the germs and hulls will sink, and lie in a mass on the bottom, the germs above, the hulls below, since the germs, each of which contains a globule of oil, are lighter (that is to say, of less specific gravity) than the hulls. By means of some foreign substance capable of being held in suspension, or of uniting in solution with the water, the density of the liquid may be increased so that the germs will rise and float on the surface, while the hulls remain on the bottom. If in such case an opening or chute be provided near the upper edge of the containing vessel, and if provision be made for introducing into the vessel, by a regulated feed, additional crushed grains, mixed in due proportion with liquid of the appropriate density, then, while a portion of the hulls already separated, and equal in quantity to the increment of hulls, is constantly being removed (this being so done that the action of the liquid in continuously raising the germs from the hulls as so introduced is not interfered with), the liquid, together with the germs, will flow out of the chute continuously, and in a regulated volume. If a vibrating sieve, inclined outward from the lower exterior edge of the chute, and downward towards some receptacle with which it may be connected by an open mouth or spout, and having underneath a second vessel, be also provided, then the germs will pass over the sieve into the one receptacle, and the overflowing liquid will pass through the sieve into the other. By this process the mass of crushed corn and liquid, kept constant in volume by a regulated feed, may be continuously separated; the liquid passing into one receptacle, the germs into another, and the hulls into a third.

The first of the patents in suit concerns the treatment of corn, and involves a process in general outline as already suggested. The stratum of hulls lies in the bottom (a cross section of which is a half circle) of a long compartment, vat, or trough, wherein is contained longitudinally a revolving shaft, supplied with transversely projecting blades, set angularly to their planes of revolution. By the action of these blades (whose orbits do not approach or disturb the upper surface of the liquid) the stratum of hulls, as the germs part and rise through the liquid to the surface, is continuously stirred and moved from the receiving end of the trough to the opposite end, where a series of perforated scoops, attached to a belt running on a pulley affixed to the shaft and another pulley above, continuously lifts the hulls so accumulated, and deposits them upon an inclined, vibrating sieve, whence they pass into a receptacle provided to receive them. Water from pipes above this sieve is sprayed over the passing hulls, washing off the dense, adhering liquid

brought up from the trough, which liquid, together with the increment of water, passes into a receptacle below the sieve, and thence, by a pipe, back into the main vat or trough. In the process of this patent the particles of starchy matter or flour are not removed initially from the broken grains. The grains, having been previously softened by soaking, or in some other way, are then crushed. The crushed grains are then mixed with water and stirred, and this mixture is continuously fed into the receiving end of the long vat, through a pipe which connects with the vat near its bottom, in order that the surface of the contained liquid may not be disturbed. The liquid made use of in this process is water brought to the requisite density for floating the germs by the particles of starchy matter or flour softened in the preliminary soaking, and released and dissolved in the preliminary crushing and stirring, and by the action of the bladed shaft already mentioned. These dissolved or comminuted particles are held in suspension in the water, and the proportions of crushed corn and water, and the rapidity of the operation, are graduated so that the appropriate density in the liquid (10° or 12° Baume) is permanently maintained. If the degree of density be too low, the germs will sink; if too high, the hulls will float along with the germs. In other words, the separating liquid, formed as stated, and called "starch milk" in the patent, is maintained at such density that the germs float and the hulls sink. By this process the mass of crushed corn and water divides itself, and forms a lower stratum of hulls, a middle stratum of starch suspended in water, and an upper stratum of germs. Each subdivision is gradually and continuously separated from the mass; the starch milk and the germs passing through the chute together by gravity, and the starch milk by gravity parting from the germs, and passing into the receptacle below the sieve. The claim of this patent is expressed in the following words:

"The process of treating corn in the manufacture of starch, glucose, and other products therefrom, herein described, which consists in mixing with corn, which has been softened and crushed, sufficient water to form a mixture of such density that the germs of the corn will tend to separate from the hulls and other heavier portions, and rise to the surface of the mixture, and in mechanically stirring such mixture in a separating tank or compartment provided at the top with a suitable chute, and thereby causing the germs and pieces of germs to be carried off in a surface current caused to overflow through the chute by the influx of crushed corn and water into the separating tank, and in removing the hulls and adherent matter from the lower stratum of the mixture by mechanical means; the materials removed from the separating tank being respectively screened in the usual manner, and the purified mixture of the mealy parts of the corn and water being collected in a suitable reservoir."

It is said that this claim is void prima facie. Counsel for appellees insists that the claim "is void upon its face," and independently of the prior art. "This position," he says, "is based upon the well-known principle that that which is shown but not claimed in a patent is thereby disclaimed, and conceded to be old and public property. It is apparent upon the face of the process patent in suit that Behr made no attempt to claim broadly the separation

of the germs from the perisperms by immersing a mixture of the two in a liquid of intermediate specific gravity. He admitted this process of separation to be old, and stated his invention to be the carrying out of this process in the particular manner determined by the apparatus employed for the purpose." Counsel insists that the words, "mixing with corn, which has been softened and crushed, sufficient water to form a mixture of such density that the germs of the corn will tend to separate from the hulls and other heavier portions, and rise to the surface of the mixture," describe the process, and he goes on to say:

"Had Behr been the first to do this, he would have been the inventor of a process. If his claim stopped here, and at the same time were novel, the claim might be patentable as a process claim. This process, however, was not novel. This is not only shown by the prior art, but is conceded by the fact that Behr did not claim the process broadly, as above stated."

The point of novelty will be considered later. The question now concerns the prima facie validity of the claim. Owing to the natural qualities which distinguish the constituents of a grain of corn, namely, the germ, the starchy portion, and the hull, and the natural qualities of water, the characteristic process of the claim is attained under the conditions named therein; that is, when the apparatus specified, or some equivalent apparatus, is supplied. Without the forces inevitably and naturally brought into play by the water and the ingredients of the corn grains, the apparatus would accomplish nothing. The apparatus is functional, towards the result intended, only as supplying conditions under which movements and changes of structure due to the natural qualities of the substance treated take place. If the process be new, if it were first reduced to practice by the apparatus proposed or indicated in the claim when read in the light of the specification, then the claim sets forth a new means. If the operation, namely, the automatic separation of an increasing mass of corn into germs, hulls, and starch by means of starch milk, itself continuously and automatically formed in the course of the operation, be new, then the claim would seem to be valid and patentable. In 1 Rob. Pat. (footnote 2), p. 256, we find the following:

"For, if the operation performed by the machine is new in reference to the object upon which it is employed, a new process has been invented; and this is no less true if the machine or instrument employed is new than if it were old, or if the process can be performed in no other known way than by this particular machine. While, on the other hand, if the operation is known in reference to the object, the invention of a new machine for performing it does not make a new process, but only a new instrument for applying it. Thus, in the art of planing lumber, if the end to be accomplished were the smoothing of the boards, and there were no known methods of attaining this end, the process of smoothing by removing inequalities would be a means, and the inventor of this process would be entitled to a patent for it, no matter what method he may have employed. But, it being once apparent that smoothness could be effected by removing inequalities, the removal of inequalities becomes the end, and a process for removing them the means; and, if the process now invented for that purpose be the cutting of the surface by a group of knives applied in a certain speed or order of succession, this also, as a new means, is a new invention. This peculiar excision of the surface

now becomes an end, and every machine devised for performing it a means; and at this point invention passes from process into instrument, and every subsequent invention for the same end is only as broad as the new character of the instrument produced. Whether or not a new machine is the reduction to practice of a new process, or is a new instrument for the performance of an old process, is therefore to be determined by the state of the art at the date of the invention. If it is the former, the process is patentable, though the machine be new. If the latter, only the machine can be allowed the protection of the law."

In Corning v. Burden, 15 How. 267, 268, the supreme court of the United States said:

"The term 'machine' includes every mechanical device, or combination of mechanical powers and devices, to perform some function and produce a certain effect or result. But where the result or effect is produced by chemical action, by the operation or application of some element or power of nature, or of one substance to another, such modes, methods, or operations are called 'processes.' * * * It is when the term 'process' is used to represent the means or method of producing a result that it is patentable, and it will include all methods or means which are not effected by mechanism or mechanical combinations."

The opinion of the supreme court in Locomotive Works v. Medart, 158 U. S. 68, 15 Sup. Ct. 745, contains the following statements:

"It may be said in general that processes of manufacture which involve chemical or other similar elemental action are patentable, though mechanism may be necessary in the application or carrying out of such process, while those which consist solely in the operation of a machine are not. Most processes which have been held to be patentable require the aid of mechanism in their practical application, but, where such mechanism is subsidiary to the chemical action, the fact that the patentee may be entitled to a patent upon his mechanism does not impair his right to a patent for the process, since he would lose the benefit of his real discovery, which might be applied in a dozen different ways, if he were not entitled to such patent. But, if the operation of his device be purely mechanical, no such considerations apply, since the function of the machine is entirely independent of any chemical or other similar action. A review of some of the principal cases upon the subject of patents for processes may not be out of place in this connection, and will serve to illustrate the distinction between such as are and such as are not patentable. * * * It will be observed that in all these cases the process was either a chemical one, or consisted in the use of one of the agencies of nature for a practical purpose. It is equally clear, however, that a valid patent cannot be obtained for a process which involves nothing more than the operation of a piece of mechanism, or, in other words, for the function of a machine."

Eames v. Andrews, 122 U. S. 40, 7 Sup. Ct. 1073, concerned a process claim, wherein, as a means for obtaining water, air pressure tending to drive the water from a distance through an underground, water-bearing stratum, and into the lower end of a vertically sunken tube, from which the air had been exhausted, was made use of. The apparatus was a hollow shaft containing a pump. Mechanical means was employed to drive the shaft down to and into the water-bearing stratum, so that the material of said stratum would be compacted against the lower end. The supreme court of the United States quotes with approval from the opinion of Mr. Justice Blatchford, at the circuit, the following:

"The novelty of the process under consideration does not lie in a mechanical device for sinking the shaft, or raising the water to the surface, but in the method whereby water, by the use of artificial power, is made to move with

increased rapidity from the earth into the shaft, whence it results that a tube but a few inches in diameter, driven down tightly to a water-bearing stratum of the earth, affords an abundant supply of water to a pump attached thereto, and constitutes a practical and productive well. Such an invention is without the field of mechanical contrivance. It consists in the new application of a power of nature, by which new application a new and useful result is attained. There is no new product, but an old product—water—is obtained from the earth in a new and advantageous manner."

Cochrane v. Deeneer, 94 U. S. 780, sustained a process patent for making flour. An air blast in connection with mechanical apparatus was made use of. Commenting on this decision, the court said in the case of Locomotive Works v. Medart, already referred to:

"It will be observed in this case that the process for which the patent was sustained * * * was a series of acts performed upon a subject-matter to be transformed and reduced to a different state or thing."

The apparatus named or indicated in the process claim in question (the "separating tank," "provided at the top with a suitable chute"; the "mechanical stirring," and "removing the hulls"; the screening the removed hulls and germs, respectively, from the starch milk; and the ultimate reservoir for the latter) is, as expressed by the supreme court, "subsidiary" to the process. The apparatus supplies the conditions under which the process, the operation of natural forces, goes on towards the ultimate result of obtaining from the corn the starch, the oil germs, and the hulls. If the process as reduced to practice by Behr be novel, then it cannot be treated as out of the field of invention, and hence a mere result or function of the apparatus. On this hypothesis the claim is prima facie valid.

It is strongly contended that the process of the claim in suit is found in the prior art. Many patents were shown in evidence. A British patent to one Anderson in 1857, concerning an improvement in the treatment of maize, contained the following language:

"A quantity of the grains of maize or Indian corn is primarily placed in a trough, or other suitable vessel, for the purpose of steeping them so as to disintegrate or partially disintegrate the component parts of the solid matter of the grains. The softening of the grains may be effected either by means of water, or the operation may be hastened by using an alkaline or saline solution in lieu of pure water. Whatever menstruum or fluid be used, a sufficient quantity thereof to cover the grains of maize or Indian corn contained in the trough or other vessel is poured or allowed to flow into the same. The maize is allowed to remain in the fluid until it is sufficiently softened. The fluid, having access to the solid internal matter of the grains, acts upon the vegetable granules, and serves to separate or partially separate them from the embryo of the plant. This softening or partially disintegrating process having been effected, the steep water or fluid is run off from the trough or vessel containing the grains. The maize, after undergoing the preparatory process of steeping, is passed between rollers, or otherwise subjected to mechanical pressure or frictional action, in order to further reduce the grains, and effect the more complete separation of the embryo from the perisperm or albuminous vegetable matter. The maize thus far prepared is now to be placed in a fluid, the specific gravity of which must be such as to allow the perisperm or albuminous portion of the grain to sink to the bottom of the containing vessel, whilst the embryo floats upon the surface of the fluid. This separation of the starchy matter from the embryo by gravitation may be conveniently and economically effected by means of salt and water, the density or strength of which must be regulated so that the albuminous or starchy matter is not held in sus-

pension, but will fall through the solution to the bottom of the vessel. The floating embryo of the grain is skimmed or otherwise removed from the fluid. * * * The saline or other solution is now to be run off from the perisperm or albuminous portion of the maize or Indian corn."

Clearly, the idea of detaching and dissolving starch particles to make starch milk, from which the starch is to be ultimately extracted, and at the same time of so controlling the density of the starch milk that the hulls will sink while the germs float (in other words, the idea of starch milk as an instrumentality whereby the germs and hulls can be separated) is not found in this Anderson publication. In the process of the process patent in suit, the regulated feed, the regulated surface overflow of germs and surplus starch milk, and the mechanically removing and stirring the lower stratum of the mixture, whereby the dissolution and liberation of softened and loosened starch particles to be held in suspension is aided, are functional. Without these agencies the requisite density of the liquid could not be maintained so that the process could be realized. This is not an intermittent process. If the feed is stopped, the surface overflow will stop. If the action of mechanically stirring the lower stratum ceases, then all parts of the corn will gradually sink to the bottom. The natural qualities of the ingredients composing the mixture actively assert themselves to the end proposed in the patent only by the aid of a going apparatus.

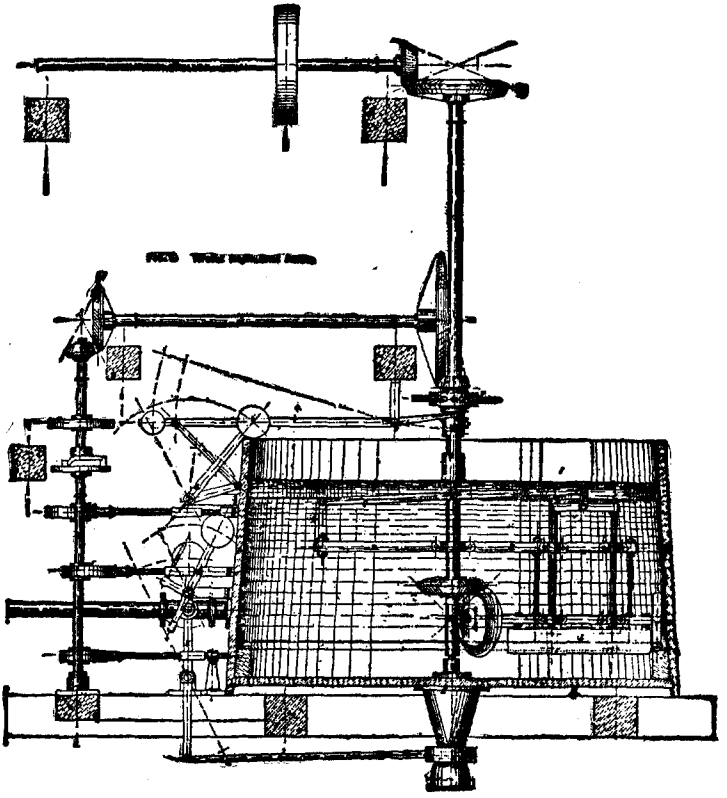
A subsequent British patent to the same Anderson contains the following language:

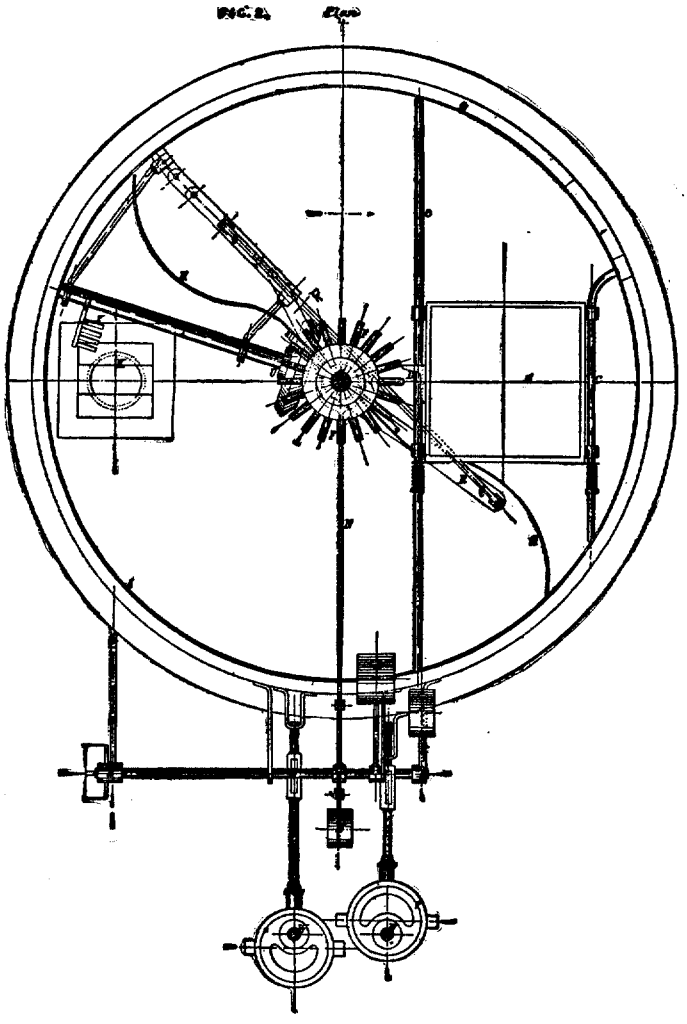
"In one modification of the separating process the use of a saline solution to float the embryo is dispensed with, and the liquid is made of sufficient density to effect that purpose by mixing into it some starchy matter from a previous operation, or in process of separation, and, by preference, in its undried state."

In this patent to Anderson the hull was first separated from the germ, or "embryo," as Anderson calls it, by an operation called "decortication." The "separating process" mentioned in the quotation was intended to part from the germ or embryo the starchy matter or perisperm adhering thereto. The words quoted seem to indicate that, in place of salt, starchy particles may be taken up and held in suspension by the water during the operation, and that the liquid may be thereby made of sufficient density to float the germs, which can then be removed, leaving the starchy portion behind. The Anderson patent contains no other suggestion, than as above quoted, in any way pertinent to the question here. It contains no suggestion of any apparatus of any kind to be used in carrying out the hint contained in the language above quoted. No stirrer or mechanical appliance is proposed, whereby the dissolution and liberation of the starch particles may be aided and controlled towards any practical result. The language quoted contains a hint which might have developed something useful by further experiment with apparatus to be contrived by the experimenter. It is enough for the present case that Anderson got rid of the hulls by decortication. The idea of separating the germs from the hulls by making the con-

taining liquid of such density as to float the former and submerge the latter, such liquid being starch milk, itself obtained in the operation, which operation is to go on continuously upon a mass of material kept uniform in volume by a regulated feed, is not found in the Anderson patent. The idea of so controlling the density of the liquid that the hulls will sink, or of utilizing a liquid so obtained to separate the germs, not only from the starch, but also from the hulls, is not found in that patent. It will scarcely do to say that the process of the claim in suit is anticipated by the Anderson patent, or that prior processes wherein foreign substances or chemical combinations were resorted to to obtain the requisite density in the separating fluid can be treated as anticipating the process of the patent in suit.

Each of the experts for appellees swears that in his judgment the Cavaye British patent of 1872 shows most distinctly the process of the process claim in suit. The apparatus, in vertical longitudinal section and in plan, is shown in the two figures below:





Following is the description of the apparatus, and of what takes place by means of it, as given in the patent.

"The said apparatus is constructed with a vat, A, filled with water, in which the mixture of germs and crushed grains is caused to fall by means of a rectangular vibrating hopper, B, the bottom of which is formed of an iron plate perforated with holes so as to distribute the fall of the material upon a sufficiently large surface of the basin, A, whereby the lighter germ will be caused to float on the top, and the heavier fragments of maize will fall to the bottom. The hopper, B, is supported upon two parallel columns, c, and carries at its side an angle block, D, continually pressed by the springs, E, against a cogwheel, F, attached to the vertical axle, G, fixed at the center of the vat, A. A gatherer, which is put in motion by the shaft, G, and whose height may be varied by an arm, N, brings back the floating germs, and directs them towards the door, I, through which they pass out of the apparatus. A second

gatherer, J, near the bottom, and actuated by the shaft, G, pushes the crushed maize into an aperture, K, made at the bottom of the vat, whence the substance falls into a conduit, L, closed by a trapdoor, M, which opens and shuts automatically. The arm, N, jointed at O, controls a socket, P, to which is suspended a lever, Q, one of whose jointed ends is fixed to the horizontal rod, R, fixed upon the shaft, G. It also acts as a guide to the rods, S, to which the gatherer, J, is suspended, and which are themselves supported by the free end of the lever, Q. By this contrivance the gatherer, J, can be raised or lowered according as it is desired, or not, to extract the material collected together at the bottom of the vat, A. Behind the gatherer is placed a horizontal shaft, T, put in motion by cogwheels, U, controlled by the shaft, G, and carrying at its extremity a roller, V, which moves upon a circular way cut upon the circumference of the vat, A, and which thus gives to the entire apparatus a general driving motion into the vat, A. Upon the shaft, T, is fixed an agitator, X, for separating from the grain the germs which have been drawn down to the bottom of the vat, and which are thus brought back to the surface of the liquid, whence the gatherer, H, conducts them out of the apparatus." "In order to produce alternately the agitation of the liquid, the shaft, G, which may receive motion from any suitable driving shaft, Y, transmits it by means of a horizontal shaft, Z, to two vertical shafts, W, whereon are fixed three eccentrics, a, f, j. The eccentric, a, controls the balancing levers, s, which regulate the position and the motion of the agitator, X, and of the gatherer, J. The eccentric, f, controls the cock, E, by which the water comes into the vat, A. The eccentric, j, regulates by means of a balancing lever, z, the opening and closing of the slide valve, M, for the discharge of the water and the crushed maize. It results from the use of this system of eccentrics that at the moment when the gatherer, J, is to be actuated, the whole mechanism which supports the agitator, X, descends simultaneously, the cogwheels, U, no longer control themselves, and the agitator ceases to move, in order to allow the fragments of maize to settle at the bottom of the receiver, A, whence the gatherer, J, carries them into the funnel, K. The latter precedes the outlet valve, M, which opens and shuts alternately in a very short time, determined by the eccentric, j, so as to allow the escape only of liquid strongly charged with fragments of maize; the introduction of water being effected in the same manner at intervals, and in quantities always equal to the volume discharged by the apparatus."

In the case of the patent in suit the preliminary softening of the grain, and the crushing of the softened grain which follows, and the subsequent stirring of the mixture of softened and crushed grain and water, is functional in liberating and dissolving the starchy particles to make the starch milk. In the Cavaye patent the grain is crushed dry, and the dry particles dropped on the surface of the large tank containing clear water, "whereby," it is said in the specification, "the lighter germ will be caused to float, and the heavier fragments of maize will sink to the bottom." It is a fact shown beyond question in this record, and even in this very patent, that, if the water remain quiet and undisturbed, all parts of the grain will sink to the bottom. But by the revolution of the shaft, G, to which are fixed the two arms of the sweeper, H, the cross pieces, R, and Q, carrying the gatherer, J, and the shaft, T, carrying the vertically revolving stirrer, X, the water is agitated, and made to run centrifugally around the tank, while the crushed grain is shaken from the hopper. This action (possibly referred to where it is said that "the lighter germ will be caused to float") will probably tend to throw the germs to the upper surface of the water, and towards the exterior circumference, so that more or less of the germs may collect against the outward bend, and towards the extremity of each arm of the broad sweeper, H, and be thrown over

the lower edge of the opening, I, at each half revolution. "A gatherer which is put in motion by the shaft, G, and whose height may be varied by an arm, N, brings back the floating germs, and directs them towards the door, I, through which they pass out of the apparatus." The Cavaye patent was an importation from France. The words quoted were used in translating from the French into the English. "Brings back the floating germs, and directs them towards the door, I," seems to mean that the floating germs are swept back from the center of the upper surface of the water towards the outer circumference, whence they are pushed over the opening, I, by the curved end of the sweeper, H. It must be understood that as the broad-bottomed box or hopper, B, commences to vibrate and shake down the dry, crushed corn, the sweepers or gatherers, H and J, and the intermediate cross and upright pieces, and the shaft, T, carrying the vertically revolving stirrer, X, are all turning in the water with the shaft, G. A regulated current setting towards the door, I, is not contemplated in this apparatus. As the backwardly slanting end of each forwardly curved arm of the broad sweeper, H, passes the door, I, a portion of the floating germs supposed to be collected against it will be thrown out at such door or opening. "The said apparatus is constructed with a vat, A, filled with water." As the crushed corn is shaken into the vat, of course, a portion of the water must be expelled, but the action of the mechanism in the vat is such that this expulsion would seem uncontrolled and irregular. At all events, the liquid so ejected is not the starch milk of the patent in suit, but water. If, in this Cavaye patent, any liquid at all analogous to starch milk can be formed, such liquid is ejected through the bottom of the vat, and not through the door, I. The action of this apparatus is intermittent. After a certain accumulation has been made in the bottom of the tank, the operation ceases. The water then becomes quiet, and all parts of the grain remaining in the tank sink to the bottom. The gatherer or scraper, J, having been lowered, now scrapes the mass of crushed grain along the bottom to the funnel, K, through which it passes out of the tank. When the apparatus commenced to operate, the tank held only clear water. The operation stops after a time, "in order to allow the fragments of maize to settle at the bottom of the receiver, A, whence the gatherer, J, carries them into the funnel, K." It is the reasonable inference from the drawings and the language of the specification that, when the operation stops for the purpose of removing the accumulation in the bottom, the action of the scraper, J, in circling around the bottom, is continued, and the opening and closing of the valve underneath the funnel, K, are repeated until approximately all the accumulation in the bottom has passed out. Meantime the eccentric, f, opens at alternate intervals the water passage at the side of the tank, so that for each volume of the mixture discharged through the bottom an equal volume of pure water is let into the tank. The valve, M, "opens and shuts alternately in a very short time, determined by the eccentric, j, so as to allow the escape only of liquid strongly charged with fragments of maize; the introduction of water being effected in the same manner at intervals, and in quantities equal to the volume discharged by the apparatus." Whatever liquid escapes through the bottom is

"strongly charged with fragments of maize." The starch milk of the patent in suit is not a liquid charged with "fragments of maize," in the sense in which these words are used in the quotation, but a liquid in which fragments of starch, previously softened, have been dissolved, and are so held in suspension. It is not the theory or sense of the Cavaye patent that the density of the liquid towards the upper surface is to be affected by starch milk, or that starch milk is to be generated for such a purpose, or that a special density is requisite to float the germs, or that a required density is to be uniformly maintained by means of starch milk. Whatever action in the way of floating the germs the Cavaye apparatus has at all, it has initially, and as soon as the crushed grain commences to fall into the clear water. It is apparently the theory of that patent, not that the density of water may be increased by starch held in suspension so that the germs will rise on an undisturbed surface, and be carried by an overflow out of the tank by the door, I, but that by the mechanical appliances in the tank such motion may be communicated that the germs as they fall from the vibrating hopper, B, will remain and collect on, and be thrown or swept from, a liquid surface when the liquid is pure water. In the Cavaye patent the density of the liquid towards the upper surface, so far as the same may be affected by particles of starch held in suspension, if it be so affected at all, is not maintained uniform. But the grain is not prepared with any view of liberating and dissolving starch particles to be held in suspension for the purpose of increasing the density of the liquid. It is by force of the process patent in suit that the idea suggests itself that the density of the water in the Cavaye tank may be affected in some degree by starch particles in suspension. The conception of a starch milk formed by the disintegration of previously softened starch in the grains, and maintained at such density as to float and carry off by its overflow, from a surface otherwise undisturbed, the germs of corn, while the hulls sink through such liquid to the bottom, is not found or in any way suggested by the Cavaye patent.

The infringement of the claim of the process patent seems beyond question. Appellees have the separating tank or trough with the rounded bottom, into one end of which is introduced, mixed with water, corn which has been first softened, and then crushed. They have the horizontal revolving bladed shaft, with the blades set at an angle to the planes of revolution, which gradually moves the stratum of hulls towards the far end of the tank, where such hulls are passed from the tank through an outlet with an adjustable gate, and there received on a screen through which such portion of the starch milk as goes out with the hulls is drained into a reservoir. They have, for the surface overflow of starch milk and germs, a pipe through the far end of their tank or trough, the mouth or interior end of which is curved upwards towards the level of the liquid. Towards and through this outlet the current from the upper surface carries the germs and starch milk to a receiving sieve, through which the starch milk drains into a reservoir. At the receiving end a cross piece is attached either to and across the upper portion of the tank, or else to that edge of the inlet or feed pipe or conductor most remote from the receiving end of the tank, in or-

der to prevent the influx of the mixture from disturbing the upper surface of the water into which the germs are to rise. In the process made use of by appellees the starch milk formed in the course of the operation, and out of the materials operated upon, is the means of raising the germs to the surface while the hulls remain in the bottom.

The patent No. 247,153 concerns certain mechanism or apparatus for use in carrying out the process of the other patent. As stated in the commencement of this opinion, two claims of this second patent are here in dispute,—the first and the fifth. The first reads:

"A separating tank or compartment, provided with a stirrer, and having a chute or opening in its wall for fixing the direction of the overflow from the separating compartment, in combination with an inclined vibrating sieve for screening the germs carried off in the overflow, and a trough or reservoir for receiving the starch milk which drains through the meshes of such sieve, and means for mechanically removing from the lower stratum of the mixture in the separating tank the heavier portions of the corn, consisting of the hulls and matter adherent thereto, substantially as described."

The specification of this patent shows near the far end of the separating tank a cross partition. If a horizontal line be drawn along this partition, from one side of the tank to the other, and through the center of the revolving shaft, the lower portion of this partition, as far as described, would be a half circle. One-half of this half circle is cut away, leaving an opening in said partition in the form of a quadrant. Through this opening the adjacent extremity of the stratum of hulls is continuously moved by the bladed, revolving, horizontal shaft. A series of elevator buckets, fastened to a belt running on pulleys, removes the hulls as the same are pushed through said opening. The expert for appellant was of opinion that the "means for mechanically removing from the lower stratum of the mixture in the separating tank the heavier portions of the corn, consisting of the hulls and matter adhering thereto, substantially as described," was the bladed horizontal shaft, and the hole through the partition, as last described. This bladed shaft is previously specified as a factor in the claim. It is called the "stirrer." As this claim is worded, the means for removing the hulls from the lower stratum of the mixture is obviously the string of elevator buckets. The lower stratum runs through the opening in the partition. The removal is from the extreme end beyond the partition. Since the elevator buckets are functional in lifting the hulls to an elevation whence the starch milk will run back into the separating compartment (a portion by the box which incloses the buckets, and the remainder by a pipe), the hole through the bottom of appellees' trough is not the equivalent of the buckets, with their associated mechanism. These apparatus claims are to be read and thought about as though the process which they are intended to subserve were public property, open alike to appellees as to appellant. So understood, the fifth claim, "in a separating tank, substantially such as described, the shallow vertical partition, C^5, as and for the purpose set forth," does not, in our judgment, involve invention. The purpose being to prevent the surface where the germs are to float from being disturbed by the influx of the mixture to be separated, the shallow vertical partition, C^5, is obvious. To contrive such a partition for

such a purpose would seem not to involve invention. We think the process claim of the first patent is valid, and that the same has been infringed, that there is no infringement of the first claim of the apparatus patent, and that the fifth claim of the apparatus patent is void. The judgment is reversed, and the cause remanded for further proceedings not inconsistent with this opinion.

WOODS, Circuit Judge (dissenting). We are agreed that the apparatus of Behr's second patent contains no invention, or has not been infringed, and it seems to me equally clear that the process of his first patent is lacking in the essential quality of novelty. In the principal opinion it is said:

"If the operation, namely, the automatic separation of the increasing mass of corn into germs, hulls, and starch by means of starch milk, itself continuously and automatically formed in the course of the operation, be new, then the claim would seem to be valid and patentable."

While this proposition, which seems to be advanced as the basis of the discussion, and as the test of patentability, makes a "continuous" and "automatic" formation of starch milk out of an "increasing mass" of corn essential characteristics of the process, the claim of the patent does not require their presence. The apparatus described is capable of a constant operation, but whether the starch milk will be continuously formed, like the continuity of other parts of the process, depends, as the specification itself says, "upon the continued introduction into the separating tank of crushed corn and water in the proper relative proportions," and, it should have been added, in proper quantities; but that such continuity of movement in any step of the process is not an indispensable characteristic, the wording of the claim leaves no doubt. If it were, it would be possible to use the very apparatus described for the purpose of accomplishing the intended results of the process, without infringing the claim, simply by passing the softened corn through the crusher and into the mixing tank intermittently, or in irregular quantities, determined arbitrarily in the course of operation, or by a predetermined arrangement of the device for the purpose of causing a regularly intermittent action. The essential part of the process, it is evident, is the use of the starch milk, produced in the course of the operation, as the means of separating the germs from the hulls; and, if the claim is to be so construed as to include the effects of the operation of the apparatus described, it is easy of evasion, because neither the entire apparatus, nor any part of it, is indispensable to the performance of the process. The complete separation of the germs, hulls, and starch-making parts of corn, by means of starch milk produced in the operation, may be effected, in the simplest way, by mixing the softened and crushed corn and water in any kind of vessel, by hand or otherwise, decanting enough of the liquid to carry off into another receptacle the floating germs, or removing the germs from the mixture by means of a perforated scoop or ladle. The use of screens to separate either germs or hulls from the starch milk had been well known from the beginning of the art, and the appliances for that purpose described as a part of Behr's apparatus are mere aggregations; and the screening, as a

step in the process claimed, is likewise an aggregation. What is meant by calling the process "automatic," if anything more than that it is effected by force of natural laws and by the mechanical agencies brought into action, I do not know. Once the crushed corn and water are in the mixing tank, the process is of that character; but how the softened corn is supplied to the crusher, from which it falls into the mixing tank, and how the quantity supplied is regulated, does not appear, but evidently it is impossible that the delivery in the manner and quantity required shall be wholly automatic. I find nothing either in the specification or claim to justify calling the corn, in process of separation, an "increasing mass." At the very commencement of the operation, and until the separating tank has been filled to the point of overflow, there will, of course, be an increase of the quantity of corn in the tank; but, once the overflow has commenced, there will apparently be no further increase while the process goes on. On the contrary, the quantity will be unvarying, if the influx from the mixing tank is constant and steady, as it is intended to be. If the substance of the claim is, as I think it was intended to be, in the use of the starch milk produced in the course of operation as the means of separating the germs and the hulls from each other, and if the apparatus described is referred to simply as an available, but not indispensable, agency of effecting the process, then the words "automatic," "continuous," and "increasing mass," instead of indicating essential characteristics, are merely incidental, and in respect to the question of novelty or invention are of no significance. It is said, "This is not an intermittent process"; but, as already suggested, it may be intermittent without change of its essential character, and may be intermittently performed upon the apparatus by which it is intended to be made continuous. If the feed is entirely stopped, the surface overflow, it is true, will stop, but the mechanism meanwhile may go on, keeping up the agitation in the separating tank until the feed is renewed and the overflow recommences.

However the claim is to be interpreted, there is no step of it which is not anticipated in the prior art. The chief feature, the production and use of the starch milk, is distinctly and unmistakably suggested in the second British patent of Anderson. In his first patent he had described a process whereby the maize was first softened, then crushed, and then "placed in a fluid, the specific gravity of which must be such as to allow the perisperm or albuminous portion of the grain to sink to the bottom of the containing vessel whilst the embryo floats upon the surface of the fluid"; and it is added that a liquid of the requisite density and strength may be obtained conveniently and economically by the use of salt and water. The idea of separating the constituent parts of corn of different degrees of specific gravity by means of a liquid of intermediate gravity is here fully developed, but the possibility of effecting the separation by means of the mixed water and starch, or starch milk produced in the course of the operation, Anderson had not then perceived. In his second patent he supplied that suggestion, not by a hint, but by an unmistakable statement that the saline solution may be dispensed with, and a liquid of sufficient density obtained by mixing into the water some "starchy matter from

a previous operation, or in process of separation, and, by preference, in its undried state." The meaning of that statement is not obscure. "Other suggestion" was not necessary to help it out. It means clearly, as in the opinion of the court it is conceded "to seem to indicate, that, in place of salt, starchy particles may be taken up and held in suspension by the water during the operation, and that the liquid may be thereby made of sufficient density to float the germs, which can then be removed, leaving the starchy portion behind." No other possible meaning has been suggested. The objection made that no apparatus, stirrer, or mechanical appliance for carrying out the hint to a practical result was proposed, is not only not tenable, but is destructive of the argument it is intended to support. The method and means suggested for carrying out the process are the same, whether salt or starch is used to strengthen the liquid; and, if the Anderson patent does not anticipate the use by Behr of starch milk so produced for that purpose, then his use of the saline solution would not be an anticipation, if Behr, in connection with his apparatus, had claimed the use of that or any other mixture for the same purpose. A further objection is, that, before applying his process, Anderson got rid of the hulls by decortication. The character of the process, evidently, is the same, whether the corn has or has not been decorticated. Besides, decortication was no part of Anderson's first process, which in other respects is identical with his second; and, once the availability of starch milk had been disclosed in the second patent, the practicability of using it in the process of the first patent, to separate the germs from other parts of the softened and crushed corn, which had not been decorticated, became evident, and thereafter, of course, could not be the subject of discovery or invention. That this was so, by reason of the Anderson process, or of some other process theretofore known in the art, is recognized in the specification of the patent in suit, where it is said:

"I am aware that corn which has been subjected to wet crushing has been stirred in a tank preparatory to being sifted; but in such cases the mixture of corn and water has been separated into only two parts, to wit, the starch milk and the refuse, consisting of hulls and germs together. By my invention the hulls and germs are separated from each other, and collected in different receptacles."

This attempt to make a distinction between a process for separating corn into two parts, and one for separating it into three parts, is a specious pretense. The separation by Behr's process is in fact into four parts,—the germs, hulls, and two distinct bodies of starch milk of different densities; and a seeming virtue might just as well have been made of so describing and claiming the process. The art of separating the starchy parts of corn from the germs and hulls, or from either germs or hulls, is recognized in the earliest patents as old and easy of accomplishment, involving nothing but softening, crushing, and mixing with water, and screening. The problem was to devise a successful method of separating from other parts of the grain the germs, in order to convert them into oil, once their value for that purpose had been discovered. The method of doing it, by softening and crushing, and then mixing the corn with a

liquid of such density that the germs would rise to the surface while other parts sank, and the fact that a liquid of proper density could be obtained by mixing water and salt, and that the starch milk resulting from the operation of the process itself could be used with the same effect, were discovered by Anderson, and, as the patent in suit concedes, were practiced in the art. All that has been done since has been designed, not to improve the process, but to devise better mechanical means for carrying it into effect. And even in that particular, while the apparatus of Behr is perhaps better than any which preceded it, it contains nothing which can be dignified by the name of invention. It is strikingly like the apparatus of Cavaye, though studious care seems to have been employed to create apparent differences, both in mechanical construction and in the methods of operation, but neither in method nor mechanism are the differences such as could have been produced only by invention. Cavaye's device by design works intermittently, but it could easily have been so made or modified as to work continuously. And so, without change, the apparatus of Behr can be operated intermittently, and, with modifications suggested in the Cavaye machine, could be so operated automatically. In Cavaye's device the crushed grain is fed in a dry condition into the mixing and separating tank, while in the device of Behr the grain has been first softened and crushed; but either mode of treatment was well known, and open to common use. To the assertion or inference that Cavaye had no conception or knowledge of the production and use of starch milk as the medium for softening the germs, it is sufficient answer that from the date of Anderson's second patent that knowledge belonged to the art, and Cavaye must be presumed to have had it. It is also said that starch milk would not form from dry meal dropped into the water in the manner of Cavaye's device, but that is asserted without other proof than the opinion of an expert, who, after stating his belief to that effect, went to the other extreme of saying that, if it did form, it would become so dense that the hulls could not sink, showing a perception that the starch milk must inevitably form in the Cavaye tank, while the fact was ignored or overlooked that there is, in the operation of that tank and its adjuncts, a regular introduction of fresh water, which would tend to prevent undue density, and that, if necessary, the quantity of water introduced could be varied, as it must be in Behr's process, to meet the requirements of the operation as it goes on. It is said further that "if in this Cavaye patent any liquid at all analogous to starch milk can be found, such liquid is ejected through the bottom of the vat, and not through the door at the top of the tank"; but, manifestly, before being thrown out it would drive the germs towards the surface, and in some degree would itself pervade the whole body of water in the tank, and tend to give it the density necessary to carry the germs to the top, thence to be expelled through the opening provided for that purpose. It seems to me equally illogical and unwarranted to say that "it is not the theory or sense of the Cavaye patent that the density of the liquid towards the upper surface is to be affected by starch milk," since in a body of thoroughly agitated water, as that

in the Cavaye tank is intended to be, there can not be a condition in the lower parts which will not with some effect extend to the top, and it is not to be presumed that Cavaye did not understand and intend the operation of natural laws so well and generally understood that mention of them was not necessary. The expert, while denying density of water in the tank sufficient to float the germs, attributes to Cavaye the ridiculous idea that, being pushed outward to the low place in the wall, "the thus piled-up germs would tumble over the top of the said low place in the wall, and thus be discharged from the tank." If a single germ could not float, it is evident that a pushing arm, the front face of which is a perpendicular plane, could not cause a mass of them resting on the water to pile up high enough to tumble out over the top of an opening, to the bottom of which, only, the water came. The bottom of the opening, doubtless, was meant, instead of the top; but, so amended, the proposition remains impossible. The fact that the germs of corn do not float in clear water was well known in the art, and presumably to Cavaye; and when he employed in his specification the expression, "whereby the lighter germs will be caused to float on top," it is not a fair or necessary inference that he understood, or supposed others would understand, that the germs would float instantly upon being dropped into the clear water, nor is it necessary to infer that his meaning was that they would be caused to float by reason alone of the agitation of the water caused by the devices connected with the rotating shaft. The agitation was doubtless intended, like the paddles of the separating tank in the patent in suit, to be instrumental in "promoting the rising of the germs to the surface." To sum the matter up, the prior art told Cavaye that the germs of corn could be made to float, and the hulls to sink, in a mixture of water and starchy parts of the corn produced in the process of separation; and, if it were conceded that the apparatus of Cavaye was not intended to embody that process, it needed no material alteration or reconstruction, and could involve no invention to make it do so, either by continuous or by intermittent action.

There is a possible construction of the claim that would make it include a process which might be declared patentable. If the terms of the claim permit or require that the particular effect of the operation of any part of the mechanism described be regarded as a constituent or essential part of the process as claimed, it is the expression concerning "the influx of crushed corn and water into the separating tank." This seems to be regarded by the court as making the operation described as carried on in the mixing tank a part of the process, but, if it has that effect, it should also be regarded as including the return current of starch milk, which is shown to come back through a pipe into the separating tank after separation from the hulls by the action of the vibratory screen near the top of the elevating device; but, with that feature included, the appellees have not infringed. That return current, while the apparatus is kept in motion, and supplied with crushed corn, as intended, is a constantly efficient force in causing the germs to be carried off in a surface current through the chute of the separating tank. Indeed, according

to the description given in the patent for the apparatus, the return starch milk is conducted to the mixing tank, as well as to the separating tank, by means of two distinct pipes.

FURNITURE CASTER ASS'N v. JOHN TOLER SONS & CO.

(Circuit Court, D. New Jersey. January 27, 1898.)

COMPROMISE AND SETTLEMENT—PATENT SUITS—ENTRY OF DECREES.

The real parties in interest in suits on patents owned by them respectively agreed upon a settlement based upon the principle that each patent was valid for the particular device described therein, and not in conflict with the other. The agreement then provided, among other things, that each party would consent to the entering of an injunction in any case to properly protect the rights of the other in accordance with this settlement; and that one of the parties might enter decrees in its favor establishing the validity of its patent, and granting an injunction against the other, according to the principle of settlement. *Held* that, as the agreement was expressly to settle all differences, the court would only allow the entry of this decree on condition that the party asking it would consent to the entry of a like decree against itself in the other suit.

This was a suit in equity by the Furniture Caster Association against John Toler Sons & Co. for infringement of a patent.

A. C. Denison, for complainant.
Thomas F. McGarry, for defendant.

KIRKPATRICK, District Judge. This matter comes before the court on supplemental bill for leave to enter a final decree in accordance with an agreement in writing between the complainant and one William S. Gunn, who is the real defendant in interest. The facts, as disclosed by the record, are that at the time of the making of the said agreement there was pending in this court a suit brought by the complainants herein against the defendants, setting out that the complainants held by assignment a certain patent issued to Berkey & Fox, July 13, 1886, and designated No. 345,613, issued for a certain new and useful improvement in furniture casters, fully described therein, and charging that the said defendants, in violation of their rights, were infringing upon their said patent rights by the manufacture and sale of furniture casters embodying some of the inventions and improvements especially described and claimed in their said patent, and praying that they might be enjoined and restrained from so doing. To this bill the defendants duly answered, denying infringement in fact, and setting up the invalidity of the patent sued upon. Testimony was taken by both parties after replication duly filed. It also appears that, prior to the making of the agreement above referred to, a similar bill, with the same object, had been filed by the complainants in the circuit court of the United States for the district of Connecticut against George D. Clark and William L. Cowles, and was still pending, to which suit also the said Gunn was the real defendant in interest. It is also set out in the