1224

Case No. 14,041.

TILGHMAN v. MITCHELL.

{9 Blatchf. 1; 4 Fish. Pat. Cas. 599.}[1]

Circuit Court, S. D. New York. Aug., 1871.

PATENTS—INFRINGEMENT—APPARATUS FOR DECOMPOSING FATTY BODIES—MEASURE OF DAMAGES—PROFITS—SAVING.

1. By the use, for decomposing fatty bodies into fat acids and glycerine, of the apparatus 1225 described in letters patent of the United States granted to Robert Alfred Wright and Louis Jules Fouché;, January 25th, 1859, for "improvements in process for decomposing fats," such fatty bodies are so decomposed by the action of water at a high temperature and pressure, and the process is used which is described and claimed in letters patent of the United States granted to Richard A. Tilghman, October 3d, 1854, for 14 years from January 9th, 1854, for an "improvement in processes for purifying fatty bodies."
2. The fact, that, in using the Wright and Fouché; apparatus, a lower temperature is employed than that designated in the Tilghman patent, and the fact that more time is employed for the operation, and the fact that a continued agitation or circulation of the fat, water, and steam is kept up, make no difference in the conclusion.
3. The defendant having employed, before he adopted the Tilghman process, a process in which he used lime and sulphuric acid, and it being shown that, as a result of the use of the Tilghman process, he dispensed with the use of lime and sulphuric acid, and saved a quantity of fat which was lost by the use of the prior process, and obtained an increased profit from the glycerine produced: *Held,* that the plaintiff was entitled lo recover, as profits, on an accounting, under a decree, in a suit in equity, such saving of lime, sulphuric acid and fat, and such increased profit in respect of glycerine.

{This was a bill in equity by Richard A. Tilghman against Roland G. Mitchell.}

Motion upon exceptions to the report of the master in the case of Tilghman v. Mitchell {Case No. 14,043}.[2]

George Harding, for plaintiff.

Charles M. Keller and Stephen D. Law, for defendant.

BLATCHFORD, District Judge. This case comes up on exceptions taken by the plaintiff to the report of the master, filed February 7th, 1870. On the 1st of December, 1864, an interlocutory decree was made in the cause, on final hearing, by which it was referred to the master to state and report to the court an account of the gains and profits which the defendant had received, or which had arisen or accrued to him, from infringing the exclusive rights of the plaintiff by the manufacture, use, and sale of the improvements patented in the letters patent upon which the suit was brought. The bill was filed in 1862. It was founded on letters patent granted to the plaintiff October 3d, 1854, for an "improvement in processes for purifying fatty bodies." The term of the patent was for 14 years from the 9th of January, 1854.

In his specification the patentee says: "My 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 their base. For this purpose, I subject these fatty or 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. I mix 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, until the operation is complete. 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. The process may be performed more rapidly, and also continuously, by causing the mixture of fatty matter and water to pass through a tube or continuous

channel, heated to the temperature already mentioned, the requisite pressure for preventing the conversion of water into steam being applied during the process; and this, I believe, is the best mode of carrying my invention into effect. In the drawing hereunto annexed are shown figures of an apparatus for performing this process speedily and continuously, but which apparatus I do not intend to claim as any part of my invention." He then describes the construction of the apparatus shown by the figures in the drawing. The fat or oil, in a fluid state, is placed in a vessel with from one-third to one-half its bulk of warm water, a disc or piston, in the vessel, perforated with numerous small holes, being kept in rapid motion, up and down, in the vessel, to cause the fat or oil and water to form an emulsion or intimate mechanical mixture. A force pump, like those in common use for hydraulic presses, then drives the mixture through a long coil of very strong iron tube, which, being placed in a furnace, is heated by a fire to about the temperature of melting lead. From the exit end of the heating tubes, the mixture, which has then become converted into free fat acids, and solution of glycerine, passes on, through another coiled iron tube, immersed in water, by which it is cooled down from its high temperature to below 212° Fahrenheit, after which it makes its escape through an exit valve into a receiving vessel. The specification says: "The iron tubes I have employed and found to be convenient for this purpose, are about one inch external diameter, and about half an inch internal diameter, being such as are in common use for Perkins' hot water apparatus. The ends of the tubes are joined together by welding to make the requisite length, but, where welding is not practicable, I employ the kind of joints used for Perkins' hot water apparatus, which are now well known." The heating tube is coiled several times backwards and forwards, so as to arrange a considerable length of

tube in a moderate space. The different coils of the tube are kept about a quarter of an inch apart from each other, and the interval between them is filled up solid with cast iron, which also covers the outer coils or rows of tubes, to the thickness of one-half or three-quarters of an inch. This casing of metal insures a considerable uniformity of temperature 1226 in the different parts of the coil, adding, also, to its strength, and protecting it from injury by the fire. The exit valve is so loaded, that, when the heating tubes are at the desired working temperature, and the force pump is not in action, such valve will not be opened by the internal pressure produced by the application of heat to the mixture; and, therefore, when the force pump is not in action, nothing escapes from the exit valve, if the temperature be not too high. But, when the pump forces fresh mixture into one end of the heating tubes, the exit valve is thereby forced open, to allow an equal amount of the mixture, which has been operated upon, to escape out of the cooling tubes at the other end of the apparatus. The specification adds: "No steam or air should be allowed to accumulate in the tubes, which should be kept entirely full of the mixture. For this purpose, whenever it may be required, the speed of the pump should be increased, so that the current through the tubes may be made sufficiently rapid to carry out with it any air remaining in them. Although the decomposition of the neutral fats by water takes place with great quickness at the proper heat, yet I prefer that the pump should be worked at such a rate, in proportion to the length or capacity of the heating tubes, that the mixture, while flowing through them, should be maintained at the desired temperature for ten minutes before it passes into the refrigerator or cooling parts of the apparatus. The melting point of lead has been mentioned as the proper heat to be used in this operation, because it has been found to give good results. But the change

of fatty matters into fat acid and glycerine takes place with some materials (such as palm oil) at or below the melting point of bismuth. Yet the heat has been carried considerably above the melting point of lead without any apparent injury; and the decomposing action of the water becomes more powerful as the heat is increased. By starting the apparatus at a low heat and gradually increasing it, the temperature giving products most suitable to the intended application of the fatty body employed, can easily be determined. To indicate the temperature of the tubes," (the heating tubes,) "I have found the successive melting of metals, and other substances of different and known degrees of fusibility, to be convenient in practice. Several holes, half an inch in diameter and two or three inches deep, are bored into the solid parts of the castings surrounding the tubes, each hole being charged with a different substance. The series I have used consists of tin, melting at about 440° F.; bismuth, at about 510° F.; lead, at about 610° F.; and nitrate of potash, at about 660° F. A straight piece of iron wire, passing through the side of the furnace to the bottom of each of the holes, enables the workman to feel which of the substances are melted, and to regulate the fire accordingly. It is important, for the quickness and perfection of the decomposition, that the oil and water, during their entire passage through the heating tubes, should remain in the same state of intimate mixture in which they enter them. I therefore prefer to place the series of heating tubes in a vertical position, so that any partial separation which may take place while the liquids pass up one tube, may be counteracted as they pass down the next. I believe that it will be found useful to fix, at intervals, in the heating tubes, diaphragms pierced with numerous small holes, so that the liquids, being forced through these obstructions with great velocity, may be thoroughly mixed together. I deem it prudent to test the strength of the apparatus

by a pressure of ten thousand pounds to the square inch, before taking it into use; but I believe that the working pressure necessary in using the heat I have mentioned, will not be found to exceed two thousand pounds to the square inch. When it is desired to diminish the contact of the liquids with iron, the tubes or channels of the apparatus may be lined with copper. The hot mixture of fat acids and glycerine which escapes from the exit valve of the apparatus, separates by subsidence. The fat acids may then be washed with water, and the solution of glycerine concentrated and purified by the usual means. The fat acids thus produced may, like those obtained by other methods, be used in the manufacture of candles and soaps, and be applied to various purposes, according to their quality; and, when desired, they may also be first bleached by chemical agents, or purified by distillation, in a current of steam, or in a vacuum, as is now well understood. I prefer that the fatty bodies should be previously deprived, as far as practicable, of such impurities as would cause the discoloration of the fat acids produced; but, when the fat acids are to be finally purified by distillation, this preliminary purification is of less importance. When sulphuric acid, nitrous fumes, or other corrosive agent, shall have been used for purifying, hardening, or otherwise preparing the fatty body to be operated upon, I take care that all traces of it shall be washed out or neutralized, before passing it through the apparatus. Some fatty bodies, (particularly when impure,) generate, during the process, a portion of active or other soluble acid, which might tend to injure the iron tubes. In such cases, I add a corresponding quantity of alkaline or basic matter to the water and oil before they are pumped into the tubes." The claim is in these words: "Having now described the nature of my said invention, and the manner of performing the same, I hereby declare, that I claim as of my invention, the

manufacturing of fat acids and glycerine from fatty bodies by the action of water at a high temperature and pressure."

This case was brought to a hearing before Mr. Justice Nelson, who, in November, 1864, delivered a written opinion {Case No. 14,043}, 1227 in which he said: "It will he seen, not only from the specification, hut also from the claim, that the improvement patented to the complainant is the invention of a process for producing fat acids and glycerine from fatty or oily bodies, which process consists in the action of water upon these bodies at a high temperature and pressure, and which may be effected in any vessel adapted to such use. There is no claim for the vessel or machinery thus used; but, as it was essential to the validity of the process, as an invention, to show how it may be adapted to practical use, two modes are pointed out—one, any convenient vessel well known to the art, and which some of the witnesses called a digester; the other, the coil apparatus; in either of which, as appeal's from the proofs, the process could be carried into practical effect, according to our construction of the patent It was urged, on the argument, by the learned counsel for the defendant, that, upon the terms of the specification, the vessel must be entirely filled with the mixture of water and fatty matter, and then be closed, and the contents heated to the point of melting lead, and no steam be permitted to be made in the vessel; and that, upon this hypothesis, no vessel could be made of sufficient strength to endure the pressure. But we do not agree to this construction. In the first place, the degree of heat was given only as the maximum, and under which the process could be most rapidly carried into effect For, the patentee, speaking upon this part of the specification, says, that no fixed degree of heat can be given, as the different fatty or oily substances that may be used will require different degrees; and that, by starting the vessel at a low heat

and gradually increasing it, the best temperature may be ascertained for the particular substance used. In the next place, we cannot agree that a fair construction of the specification tends to the conclusion, either that the vessel was to be entirely filled, or that no steam was to be permitted in it No doubt it is true, as urged for the defendant, if thus filled, and the vessel closed, and the contents heated to the point of melting lead, or under a pressure that would prevent the existence of steam, the process would be utterly impracticable; and, doubtless, the patentee knew this would be the result, as well as any of the experts. It would require but the commonest knowledge and experience in the business of life to reach such a conclusion. This moderate degree of knowledge, at least, should be kept in view, in construing the general terms of the description. Besides, the patentee does not direct that the vessel should be entirely filled. This is an inference of the learned counsel, from the direction that the vessel must be closed, and be of great strength, so that the requisite amount of pressure be applied to prevent the conversion of the water into steam. Now, all that was intended, as is apparent from the context, by the patentee, was, that the pressure should be so great as to prevent the body of the water in the vessel from passing into steam, as the heated water was the element that separated the fatty acids and glycerine. That there would necessarily be some steam, must have been obvious to the patentee, as well as to any one of common observation. Now, upon this interpretation of the patent, and which we think is the sound one, we repeat what we have already said, that the process could be, and has been, carried into successful operation by the means pointed out by the patentee. Previous to the date of this invention, there were but two modes known, or in practical use, for decomposing fatty substances, and obtaining from them fatty acids and glycerine—one

called the lime saponification process; the other known as the distillation process. It is not material to give a particular description of these modes of separating the fatty acids and glycerine. It is sufficient to say, that they were different from the patentee's in the process or mode of producing the result, much more expensive and tedious, and have generally gone out of use, both in this country and in England, since the complainant's improvement has become generally known and practised. We have looked through the proofs in the case with some care, and without going into them in this opinion, are satisfied that the complainant was the first person who discovered the chemical fact, that fatty or oily substances could be decomposed, and the fatty acids and glycerine separated, by the action of water at a high temperature and under pressure. Then, as to the infringement, it is not material to inquire whether the vessel or machinery used by the defendant is or is not similar to that described in the complainant's patent. These constitute no part of his invention. If the defendant, or the persons under whom he uses his machinery, have discovered new means of carrying into effect the complainant's process, he or they may be entitled to a patent for that improvement. But this would furnish no right to the use of the process. The question here is—does the defendant, whatever may be his vessel or machinery, manufacture or produce fat acids and glycerine, from fatty bodies, by the action of water at a high temperature and pressure, according to the process as explained by the plaintiff in his specification? We are satisfied that he does, and, hence, has infringed the patent. Our conclusion is, that the complainant is entitled to a decree for an injunction and profits."

Voluminous testimony was taken before the master on the reference made to him by the interlocutory decree, and his report is, "that no gains or profits

have been proven 1228 to have been received by, or to have arisen or accrued to, the defendant, from the manufacture, use, or sale of the improvements patented in the letters patent set forth and described in the order of reference." The plaintiff excepts to the report of the master, and alleges, in his exceptions, that the master erred in not reporting the following facts as proved: "1. That defendant has made a profit by the saving of the quantity of lime and sulphuric acid formerly used by him in his old process, to produce the fat acids and glycerine which he now produces (without using lime or sulphuric acid) by the action of water at a high temperature and pressure. 2. That the quantity of lime and sulphuric acid thus saved by defendant is thirteen and a half pounds of lime and twenty-seven pounds of sulphuric acid on each one hundred pounds of fat decomposed into fat acids and glycerine, by the action of water at a high temperature and pressure. 3. That defendant has made a profit by the saving of the quantity of fat formerly lost and thrown away with the refuse sulphate of lime produced in his old process, but which fat is no longer lost since his use of complainant's process, in which no refuse sulphate of lime is produced or thrown away. 4. That the quantity of fat thus saved by defendant is two pounds on each one hundred pounds of fat decomposed into fat acids and glycerine by the action of water at a high temperature and pressure. 5. That the quantity of fat decomposed by defendant into fat acids and glycerine, by the action of water at a high temperature and pressure, up to the 9th day of January, 1868, amounted to eleven million five hundred and two thousand eight hundred and ninety-two pounds (11,502,892 lbs.) 6. That the saving of thirteen and a half pounds of lime, twenty-seven pounds of sulphuric acid, and two pounds of fat, upon each one hundred pounds of fat decomposed, was made and realized by defendant upon the said eleven

and a half million pounds of fat decomposed into fat acids and glycerine. 7. That the values or market prices of the lime, sulphuric acid, and fat, at the several dates when saved by defendant are those stated by him in his testimony herein. 8. That defendant has made a profit by the increased strength, purity, and value of the glycerine obtained by his use of complainant's process, as compared with that obtained by his former process. 9. That this increase of value of the glycerine amounts to one-fifth of a cent on each pound of fat from which the glycerine was utilized and obtained, by the action of water at a high temperature and pressure. 10. That the quantity of fat from which the glycerine was utilized and obtained by defendant, by the action of water at a high temperature and pressure, amounted to ten million three hundred and thirty-seven thousand one hundred and forty-seven pounds (10,337,147 lbs.) 11. That the profits made by defendant, by his use of complainant's process, amounted to the principal sum of one hundred and sixty thousand six hundred and ninety-nine 5/100 dollars ($160,699 05,) being the value of the following articles saved, at their market price when saved, viz.:

Lime saved, 1,552,889 lbs. Value.	$ 11,243 26
Sulphuric acid saved, 3,105,778 lbs. Value	100,663 51
Fat saved, 230,057 lbs. Value	28,118 01
Profit on glycerine obtained from 10,337,147 lbs. of fat, 1/5 cent per lb. fat	20,674 27
	$160,699 05

—together with interest on said sums from the dates when the saving was realized, as set forth in the calculation appended to the printed argument submitted by the counsel for complainant."

The plaintiff contends, that the defendant, by manufacturing fat acids and glycerine from fatty bodies by the action of water at a high temperature and pressure, according to the plaintiff's process, instead of by the process used by him up to the time he adopted the plaintiff's process, has saved the quantities specified, of lime, sulphuric acid, and fat, in working the specified quantities of fat, and has made the specified additional profit from the specified quantity of glycerine; tuat such saving and profit are due to the use of the plaintiff's process; and that the defendant must account for the same as profits, under the interlocutory decree. The defendant contends that he has made no gains or profits by the use of the plaintiff's invention; that such invention is incapable of practical use: and that whatever saving the defendant has made by working the process which he uses, is due to something other than any invention of the plaintiff's.

The defendant formerly used, in his manufactory, what was known as the lime saponification process. Twenty-five pounds of water and one hundred pounds of fat were put into a vat. From nine to fourteen pounds of lime were slaked in another vat with sixty-six pounds of water, and the product was then gradually poured into the fat and water, which were boiling, and the whole was kept boiling for about eight hours. It was then allowed to stand and cool, and the water was drawn off, carrying in it the glycerine. The residue, called lime soap, was then decomposed by sulphuric acid, and produced free fat acids. The defendant, since abandoning this old process, has worked under and according to letters patent of the United States, granted to Robert Alfred Wright and Louis Jules Fouché;, January 25th, 1859, for "improvements in process for decomposing fats." All the fat he has treated has been treated according to the process, and by the apparatus, described in that patent. The specification of that patent states,

that the apparatus which 1229 it describes is chiefly intended for the decomposition of fatty substances into fatty acids and glycerine. A detailed description of the apparatus and of its action is given. There are two boilers. The lower boiler, or first boiler, is completely filled with water. The upper boiler, or second boiler, is filled with water up to one-third of its height, and then filled up to a certain point with the fatty bodies to be decomposed. The first boiler, which is strong enough to resist a pressure of from ten to twenty atmospheres, is gradually heated till the proper pressure, according to the nature of the fatty matter, is attained. The superheated water, in the first boiler ascends through a tube, which runs from the top of the first boiler into the upper part of the second boiler, and there terminates in a rose jet discharging downwards. The water, passing through the holes in the rose jet, descends through the fatty matter, and passes out of the bottom of the second boiler, through a tube which enters the top of the first boiler, and passes through its interior to near its bottom, and there discharges into it. The mixture of fatty matter and water, carried down by the passage from the second boiler to the first boiler, is again heated, to recommence its ascending motion, and so on. A continuance of this operation during a period of from five to eight hours, according to the nature of the fatty bodies operated on, and according to the variation of pressure, varying from ten to twenty atmospheres, decomposes the fatty bodies into glycerine and fatty acids, the glycerine remaining dissolved in the water, and the fatty acids floating in the second boiler. The patentees say, in their specification: "We are aware that, firstly, the decomposition of fatty bodies by water, under the influence of heat and of pressure, is a well known scientific fact. Water is substituted for the organic basis; it forms a perfect and fixed combination with the fatty acids, while the glycerine is dissolved in

the excess of water. Secondly, that, as this chemical action takes place under the influence of a weak affinity, it is necessary, in addition to the above named physical and chemical conditions, to insure a perfect molecular agitation of the whole mass, and that we wish it to be understood that what we wish to claim and establish as of our invention, consists of an apparatus wherein the water and the fatty matters are heated separately in two different boilers. The first boiler is heated by the source of heat, while the second boiler is heated by the first boiler. In these, boilers, the agitation necessary for the chemical action and combination is produced by the pressure of the heated water in the first boiler. This water circulates continuously from the first boiler to the second boiler, and from the second boiler to the first, in a continuous and self-acting or automatic manner, without interruption. The characteristics of our apparatus are, that it produces agitation by circulation alone, a continuous and automatic circulation, produced by the pressure of water. Lastly, our apparatus effects the chemical action in a continuous manner, without the aid of any manual or other assistance." The claim of the Wright and Fouché; patent is as follows: "Having described the nature of our invention, and the manner in which the same is to be performed, we do not claim the application of superheated water for decomposing fatty bodies, nor the form of the apparatus above described, which may vary somewhat according to conditions and circumstances; but what we claim as our invention is, producing a continuous automatic circulation of highly heated water, in a very finely divided state, through the bodies under treatment, by means of an apparatus constructed and employed substantially as herein shown and described."

It is manifest, that, in using the Wright and Fouché; apparatus, the defendant decomposes fatty bodies into

fat acids and glycerine by the action of water at a high temperature and pressure, and thus uses the plaintiff's process. But the defendant urges that he works at a lower temperature than that designated by the plaintiff, and takes more time for the operation, and employs a continued agitation or circulation of the fat, water, and steam; and that these are features not described in the plaintiff's patent, and features to which all the profits made by the defendant are entirely due. Stress is particularly laid on the fact, that, without the use of means to produce agitation and circulation of the fat, water, and steam, the employment of heat and pressure would result in no pecuniary profit. The other points urged are disposed of by the opinion of Sir. Justice Nelson.

It is a mistake to contend that the plaintiff does not, in his specification, enforce the necessity of keeping up an intimate mechanical mixture of the fat and water during the operation. He directs that the fat and water shall be mixed, and he calls, in many places, the liquid that is being operated upon, a mixture. His description and drawing of the coil apparatus state and show that a disc or piston, perforated with numerous small holes, is kept in rapid motion, up and down, in the vessel into which the fat and water are first put, to cause them "to form an emulsion or intimate mechanical mixture." He also states, in reference to the coil apparatus, that "it is important for the quickness and perfection of the decomposition, that the oil and water, during their entire passage through the heating tubes, should remain in the same state of intimate mixture in which they enter them;" and he suggests two devices for maintaining such thorough mixture. It is impossible to maintain the proposition that the plaintiff's specification ought not to be construed as fully disclosing the desirableness of keeping the fat and water intimately mixed during the operation, with a view to 1230 effecting a speedy and

complete decomposition, as well when the "convenient vessel" first named is used, as when the coil apparatus is used. The evidence is, that the decomposition will take place without mixture, in a time proportioned to the degree of heat and the extent of the area of surface contact between the fat and the water. Having indicated the propriety of using means to maintain an intimate mixture of the fat and water, the plaintiff is entitled to use, in carrying out his process, any means then known and used in the same art, for maintaining a mixture of fat and water. In the lime saponification process, the stirring or agitation of the fat, water, and lime during the process, in order to keep up an intimate contact between the particles, was employed; and the proofs show the description or use, before the date of the plaintiff's patent, of a vertical churn agitator, to mix fat, water, and lime while being boiled in an upright boiler under pressure, of a rotary paddle-wheel agitator, to mix fat, water, and lime while being boiled in a horizontal boiler under pressure, and of a stirrer rotating on a vertical shaft, to mix fat, water, and lime while being boiled in an open tub. The plaintiff's specification is addressed to persons skilled in the department of manufacturing to which it is applicable; and the evidence is abundant to show, that such persons would have understood, as a matter of course, that, with a view to practical and profitable manufacturing, there must be agitation of the mass, and would have readily used known devices at hand to produce such agitation.

The defendant has entirely failed to show that the plaintiff's process, carried out as described in his patent, is not practicable or practical. It was put in practical operation in London in 1857, a patent having been taken out for it in England, by the plaintiff, January 9th, 1854. It was put in operation in Cincinnati, Ohio, in 1860, and has been in use, under license from the plaintiff, in the United States, ever

since, there being ten factories in the United States working under such license. The defendant was notified by the plaintiff in September, 1860, not to infringe the patent, and what he has done has been done wilfully, and not innocently.

It is abundantly shown, that the saving of lime and sulphuric acid and fat, and the increased profit from the glycerine produced, result from the use of the plaintiff's process, and not from the special apparatus of Wright and Fouché. Such apparatus is one means of producing stirring or agitation and mixture. The plaintiff's process, when earned on with other means of maintaining the mixture, produces, as is shown by the evidence, the same saving of lime and sulphuric acid, which is produced by the defendant in using the Wright and Fouché; apparatus; and such apparatus is useless unless a high heat and pressure be employed. The defendant previously used the lime saponification process, and abandoned it for the plaintiff's process. He must be regarded as having made directly, by using the plaintiff's process, the saving of lime, sulphuric acid, and fat, and the profit in respect of glycerine, which existed between the use of the two processes, and which saving and profit he would not have made if he had continued to use the old process. He has not made the saving by using the Wright and Fouché mixing apparatus. Ropes used the heat and pressure with a paddle-wheel mixer, and made the saving of lime and sulphuric acid. Jones used a pump to mix, with heat and pressure, and made the same saving. The use of superheated water is the effective decomposing agent in the defendant's process. If the use by the defendant of the Wright and Fouché mixing apparatus saves labor or fuel, as compared with any prior process, the plaintiff is not entitled to the saving thus effected. But the defendant has not shown any such saving of labor or fuel. The proof as to the saving of lime, sulphuric acid, and fat, and as to the increased

profit on the glycerine produced, at the quantities and values set forth in the plaintiff's exceptions, is full and clear.

On the hearing, the defendant's counsel did not dispute, that, if the saving of the lime, sulphuric acid, and fat was due to the use of the plaintiff's process, the plaintiff was entitled to the value of such saving, as profits. That is, undoubtedly, a correct principle, as applicable to an accounting for profits, in a case of this description, in equity.

The plaintiff's exceptions above set forth must be allowed. But, as the calculations based on the evidence taken before the master, and furnished by the plaintiff, show just how much the plaintiff is entitled to recover, it is unnecessary to send the case back to the master. The account was taken down to the expiration of the patent, on the 9th of January, 1868. The savings are calculated at thirteen and a half pounds of lime, twenty-seven pounds of sulphuric acid, and two pounds of fat, on each one hundred pounds of fat worked. This, at the prices shown by the evidence, makes the saving, in the aggregate, of lime, sulphuric acid, and fat, $140,024 78. The increased profit on glycerine, at one-fifth of a cent per pound on the quantity of fat worked, was $20,674 27. The saving of lime, sulphuric acid, and fat, is calculated from and including the 1st of July in each year, to and including the 30th of June in the following year, covering the period from and including December, 1860, to and including January 9th, 1868. The increased profit on the glycerine is calculated from and including the 1st of January in each year, to and including the 31st of December in the same year, but only covers the fat worked from and including July 1st, 1861, to and including January 9th, 1868. I think that the plaintiff is entitled to interest from and after the close of each of such years, on the ascertained value of the savings
1231 and profits for the twelve months next preceding.

Making up the account on these principles gives the following results:

Increased Profit from Glycerine Sold.

For the year ending	Amount received for glycerine sold.	Quantity of fat worked.	Profit 1-5 of a cent per lb. of fat worked.	Interest to September 1st, 1871. Years.	Percent.	
Dec. 31st. 1862	$ 6,043 82	Lbs. 1,502,316	$ 3,004 63	8 2-3	60 2-3	$1,822 81
" " 1863	7,543 07	" 1,050,420	2,100 85	7 2-3	53 2-3	1,127 46
" " 1864	16,330 16	" 1,395,142	2,790 28	6 2-3	46 2-3	1,302 13
" " 1865	15,273 70	" 1,993,051	3,986 10	5 2-3	39 2-3	1,581 15
" " 1865	17,804 88	" 1,613,263	3,226 52	4 2-3	32 2-3	1,054 00
To Jan'y 9th, 1868	35,777 94	" 2,782,949	5,565 89	2	25 28-36	1,417 17-36 76
	$98,774 47	Lbs. 10,337,147	$20,674 27			$8,305 31

Savings of Lime, Sulphuric Acid, and Fat.

For the year ending	Quantity of fat worked.	Value of lime, sulphuric acid, and fat saved.	Interest to September 1st, 1871. Years.	Percent.	
June 30th, 1861	Lbs. 1,165,745	$ 8,996 10	10 861-6	71 1-6	$6,402 77
" " 1862	" 1,502,316	11,063 28	9 1-6	64 1-6	7,098 94
" " 1863	" 1,050,426	8,718 848	1-6	57 1-6	4,984 27
" " 1864	" 1,395,142	14,556 26	7 1-6	50 1-6	7,302 39

Savings of Lime, Sulphuric Acid, and Fat.

For the year ending	Quantity of fat worked.	Value of lime, sulphuric acid, and fat saved.	Interest to September 1st, 1871. Years.	Percent.	
" " 1865 "	1,963,051	33,993 58	6 1-6	43 1-6	14,673 90
" " 1866 "	1,613,263	26,254 43	5 1-6	36 1-6	9,495 35
" " 1867 "	2,001,162	28,314 58	4 1-6	29 1-6	8,267 17
To Jan'y 9th, 1868 "	781,787	8,096 95	3 23-36	25 17-36	2,062 47
	Lbs. 11,502,892	$140,024 78			$60,287 26

This makes the total amount for which the plaintiff will he entitled to a decree, September 1st, 1871, $229,291 62. Let a decree be entered of that date for that amount, with costs.

{For other cases involving this patent, see note to Tilghman v. Mitchell, Case No. 14,042.}

{NOTE. Pending these proceedings the patent expired, and was extended for seven years from 1867. A bill was then filed, accompanied by a motion for a provisional injunction to restrain the infringement during the extended term. The motion was granted. Case No. 14,042. Both of these cases were then taken to the supreme court on appeal, and the decree in each case was reversed, and the cases respectively remanded, with directions to dismiss the respective bills of complaint. 19 Wall. (86 U. S.) 287.}

[1] {Reported by Hon. Samuel Blatchford, District Judge, and by Samuel S. Fisher, Esq., and here compiled and reprinted by permission. The syllabus

and opinion a are from 9 Blatchf. 1. and the statement is from 4 Fish. Pat. Cas. 599.]

[2] {From 4 Fish. Pat. Cas. 599.}