

**Case No. 2,074.**

BUCHANAN v. HOWLAND et al.

[5 Blatchf. 151;<sup>1</sup> 2 Fish. Pat. Cas. 341.]

Circuit Court, N. D. New York.

March 25, 1863.

PATENTS—INFRINGEMENT—INJUNCTION—TRIAL OF ISSUE AT LAW.

1. There is no inflexible rule, either in England or America, requiring a court of equity to refuse a permanent injunction, upon a final hearing, because there has been no trial at law.

[Cited historically in *American Wood-Paper Co. v. Fibre Disintegrating Co.*, Case No. 320. Cited in *American Wood-Paper Co. v. Glen's Falls Paper Co.*, Id. 321.]

2. There are cases where the nature of the patent right, and the character of the evidence by which it is to be established or overthrown, are such, that upon the most important questions involved, the conclusions of a judge—based upon repeated examinations and comparisons of depositions carefully taken and reduced to writing—would as a general rule be more accurate and reliable than the verdict of a jury, which must, of necessity, be based upon the hasty oral examination of witnesses at a circuit, and be made, in the usual manner, after only a brief consultation.

3. The first claim of Mellier does not extend beyond the use of a vessel with separate compartments for the material to be heated and for the steam heat used in the process substantially as specified.

4. As neither the degree of heat nor strength of solution is specified in the claim, and as it in terms expressly requires the use of steam heat in one compartment of a vessel with two or more compartments in the other, in which the material to be heated is to be placed, this claim does not extend to, and it is not infringed by, the use of caustic alkali in a simple single-chambered rotary boiler, heated by fire heat under or around the same.

5. The process claimed in the second claim of Mellier's patent includes only the specified boiling of the material treated, in the solution and under the conditions specified, and the prior soaking and cleansing of such material, and subsequent treatment of it by submitting it to the action of chloride of lime, as specified, are not a part of the process thus claimed.

6. A specification of “not less than 310¼ Fahrenheit” does not limit the patentee to that temperature. It was the statement of the minimum heat to produce a really beneficial result, but fixed no upward limit, so long as the process carried on by that degree of heat was in fact a boiling process, under the conditions in substance as stated in the specification.

7. Nor does a declaration that so high a temperature as eighty pounds “is not absolutely necessary” impose any specific upward limit as to the degree of heat and pressure.

8. The answer to the allegation that Mellier steeps the straw in warm water, and that the defendants do not, and that Mellier uses steam heat exclusively, while the defendant uses fire heat almost exclusively, is, that the steeping in warm water is no part of the process patented, and that under the second claim of the Mellier patent it is immaterial whether the boiling be produced by steam or fire heat, although the steeping and steam boiling are described in the specification.

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9. Even if it be true, as claimed, that a longer boiling and greater pressure produced better results than can be produced by boiling only three hours with a pressure of seventy or even eighty-four pounds, it does not relieve the defendants from the charge of infringing the Mellier patent, when the boiling, which he recommends should continue about three hours, is continued for an hour longer than he recommends.

In equity. This was a final hearing, on pleadings and proofs, of a suit in equity [by Coe S. Buchanan against Gardner Howland and Joseph B. Palser] founded on letters patent [No. 17,387] granted to Marie Amedie Charles Mellier, of Paris, France, on the 26th of May, 1857, for fourteen years from the 7th of August, 1854, for “a new and useful improvement in making paper pulp.” The bill alleged an infringement of the rights of the plaintiff, as the assignee and owner of the patent, and prayed for a perpetual injunction, and an account of profits. [Decree for complainant].

<sup>2</sup>[The specification of this patent, which is given in full, was as follows: “Be it known, that I, Marie Amedie, of Paris, in the empire of France, have made an invention for an improvement in the manufacture of paper, and I do hereby declare that the following is a full and exact description: The invention has for its object a peculiar process for the treating of straw, and other vegetable fibrous materials requiring like treatment, preparatory to the use of such fibers in the manufacture of paper; and the improvement consists in subjecting straw, or such other fibrous materials, to a pressure of at least seventy pounds on the square inch, when boiling such fibrous matters in a solution of caustic alkali. For this purpose, the straw or fibrous matters are cut into short lengths, soaked in warm water, and washed; they are then placed in a suitable boiler; and I use for such purpose a rotary boiler, provided with a coil or coils of steam pipe for the purpose of heating the contents, and I prefer that the boiling should be carried on at a temperature to produce at or above eighty pounds on the square inch, in the boiler where are the fibrous

materials to be acted upon. But so high a temperature is not absolutely necessary. For I have found by experiment that it is essential that a temperature equivalent to seventy pounds on the square inch must be employed. The quantity of alkali used is at the rate of about sixteen per cent. of caustic soda or potash, of the straw or fibrous substance under process. The fibers may then be bleached by the use of a comparatively small quantity of bleaching powder or chloride of lime. To enable others skilled in the art to make and use my invention, I will proceed to describe more fully the manner of using the same. The straw or other fibrous materials requiring a like process to prepare the same for the paper manufacture is first, as heretofore, to be cut in a chaff-cutting or other machine, into short lengths, and to be freed from knots, dirt, or dust, and then steeped for a few hours in hot water. The straw or fibrous materials and a weak solution of caustic alkali, are then to be placed in a suitable close boiler, heated by steam as hereafter explained, and the heat is to be raised to such a degree as to attain and maintain for a time a pressure internally of the boiler equal to or exceeding seventy pounds on the square inch, that is about 310 degrees of Fahrenheit; by which means a considerable saving of alkali, as well as time and fuel, results, as compared with the means of using a hot solution of caustic alkali, as now practiced in preparing straw and other fibers for paper makers. The boiler employed for the purpose, and the manner of heating it by steam, may be varied, but first it must have a rotary motion either on its long or on its small axis, by means which are very well known; and, secondly, I prefer not to send the steam directly into the liquid in which the materials are immersed, but to pass it either in a jacket around the boiler, or through a coil or system of steam pipes inside of it, so that the steam does not mix with the caustic alkaline solution in the middle portion of the boiler, but is kept separate, and does not, therefore, in condensing, dilute the caustic alkaline solution used. The plan of construction of the boiler I would recommend would be, if the boiler is to rotate vertically or on its small axis, as very well known, to cover it with a jacket so that the steam could circulate from one end to the other between the two plates, or rather, if it is to revolve horizontally or upon its long axis, as is equally very well known, to fix near each end of the boiler, and inside of it, a diaphragm or partition, which partitions are connected together by numerous tubes, which are arranged in a circle near the outer circumference of each partition. By this arrangement, the steam is introduced through the hollow axis at one end of the boiler, and it passes through the steam pipes, and thence into the compartment at the other end of the boiler, where it and the condensed steam are conveyed away, as is understood, through the other hollow axis. In adopting the plans of not sending directly the steam into the boiler, I found the three following advantages: 1st. Not to dilute, as I have already said, the alkaline solution. 2nd. To avoid the trouble of having sometimes the end of the steam pipe in the boiler choked with straw, and to prevent it, in case that by one cause or another the pressure in the steam boiler would fall under the degrees of the pressure in the straw boiler, the pressing of the first by the second, viz.: the absorption of straw and alkaline solution from the straw boiler into the steam boiler. 3d. The greatest facility for cooling the straw boiler when the pressure has been maintained for a

sufficient length of time, by means of turning off the steam at one end, letting it at the other end out of the jacket, or of the coils of the steam pipes just described, and passing through the same a stream of cold water, which, at the same time that it cools the mass, furnishes a quantity of warm water, which can be received in convenient vessels, and will be found very useful for washing the straw or other fibrous materials, after boiling. By means of submitting the straw or similar fibrous materials to the pressure of between seventy and eighty-four pounds on the square inch inside of the boiler, I can reduce considerably the proportion of alkali, and the solution which I prefer to use is to be from two to three degrees of Baume, or of a specific gravity of from 1,013 to 1,020, and at the rate of about seventy gallons of such solution to each cwt. of straw or other fibrous vegetable matter requiring like treatment. The boiler is to be filled with straw and alkaline solution, and then closed fluid and steam tight. The boiler is made to revolve slowly, say about one or two revolutions per minute, and the steam is to be admitted. I find it desirable to keep up the heat and pressure during about three hours after the pressure above mentioned has been obtained, when the process of boiling is complete. A steam gauge properly fixed upon the boiler will enable one to ascertain when the pressure has attained the required degree. When the apparatus and the fibers under process have been cooled by the means hereinbefore mentioned, or rather when the pressure has been reduced to nothing, I open the man-hole of the boiler, empty the materials in suitable vessels, and wash them, first with hot water, then with cold water, until the liquor runs perfectly clear. I then steep the fibers for about an hour in hot water, acidulated with a quantity of sulphuric acid, equal to about two per cent of the weight of the fibers under process, and finally the washing is completed with cold water. The straw or fibers may then be bleached in the ordinary manner, and it will be found to be accomplished by a comparatively small quantity of chloride of lime. Having thus described the nature of my said invention, and the manner of performing the same, I would have it understood that I do not claim the general use of caustic alkaline solution, nor the employment generally of a close boiler for boiling straw, or other vegetable fibrous substances. But what I claim as my invention, and desire to secure by letters patent, is the use of a solution of caustic soda (NaO), in a compartment of a rotary vessel, separate from that which contains the steam heat, substantially as described. I also claim the within described process for bleaching straw, consisting in boiling it in a solution of pure caustic soda (NaO), from 2 to 3 degrees Baume, at a temperature of not less than 310 degrees Fahrenheit, after it has been soaked and cleansed, and before submitting it to the action of a solution of chloride of lime, from 1 to 1½ degrees, substantially as described.”<sup>2</sup>

The answer admitted that the patentee invented the particular mode described in the patent, to wit, “by two separate steam-tight compartments, of separating the steam heat from such material whilst boiling the same, in a rotary vessel, in a solution of caustic alkali, and, also, invented the soaking and cleaning of such material, before boiling the same in a solution of caustic alkali;” but it denied that he was the inventor of any other idea, process, or improvement. In respect to the residue of the process patented, the answer alleged that the same was not novel, and it denied the infringement and the utility of the invention. The defendants, also, set up letters patent granted to themselves on the

20th of March, 1860, and other letters patent granted to them on the 3d of July, 1860, and claimed that their operations were carried on under such patents [and without the use of the invention of Amedie].<sup>2</sup>

Charles M. Keller and Joel. Tiffany, for plaintiff.

William A. Beach and John B. Gale, for defendants.

HALL, District Judge. It was conceded, at the hearing, that there had been no trial at law, in which the validity of the patent under which the plaintiff proceeds, had been established; and, also, that no preliminary injunction had been granted, or even applied for, in this suit. It was, therefore, insisted, on behalf of the defendants, that no relief could be granted to the plaintiff; that the issues upon which the validity of the patent depends are triable only at law; and that, because the plaintiff had not applied for the trial at law, of proper issues to determine the validity of his patent and its infringement, this court should now dismiss his bill, with costs. In support of these positions, the counsel cited Curt. Pat. §§ 314, 315, and note 1; Id. §§ 328, 336, and note 1; and Bacon v. Jones, 4 Mylne & C. 433. These sections of Mr. Curtis' valuable work, so far as they relate to the question now under consideration, are based mainly upon the case of Bacon v. Jones, and must, therefore, be considered in connection with the full report of that case. By that report it appears, that the lord chancellor, after speaking of applications for injunctions before the final hearing, said: "When the cause comes to a hearing, the court has also a large latitude left to it; and I am far from saying that a cause may not arise, in which, even at that stage, the court will be of opinion that the injunction may properly be granted, without having recourse to a trial at law. The conduct and dealing of the parties, the frame of the pleadings, the nature of the patent right

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and of the evidence by which it is established, these and other circumstances may combine to produce such a result; although this is certainly not very likely to happen, and I am not aware of any case in which it has happened. Nevertheless, it is a course unquestionably competent to the court, provided a case be presented which satisfies the mind of the judge, that such a course, if adopted, will do justice between the parties." In the report of the same case before the master of the rolls, (the report in Mylne & C. is of the hearing and decision before the lord chancellor, on appeal,) the master of the rolls is reported to have said (1 Beav. 387): "I think that, if a plaintiff be entitled to an injunction on the merits and on the evidence produced at the hearing, he is not to be deprived of that right, because he has not moved for an injunction at a previous stage of the cause." And see Baily v. Taylor, 1 Russ. & M. 73 76; Isaacs v. Cooper [Case No. 7096]; Wilson v. Tindal, Webst. Pat. Cas. 730, note; Hind. Pat. 356.

It is apparent, from the reports of the case of Bacon v. Jones, and other English cases, that, even in the English courts, there is no inflexible rule requiring a court of equity to refuse a permanent injunction, upon a final hearing, on the grounds urged in this case;

and certainly the American practice has not been such as to sustain the positions of the defendants' counsel. The case of *Goodyear v. Day* [Case No. 5,569], is a case, in many of its features, somewhat like the present; and the opinion of the court, as delivered by Mr. Justice Grier, states very briefly the practice of our courts, in respect to this question, and presents his reasons for proceeding to the final disposition of the cause without requiring the verdict of a jury—reasons which apply with much force in the present case. In the case of *Goodyear v. Day*, above referred to, Mr. Justice Grier, in delivering the opinion of the court, said: “It is true that, in England, the chancellor will generally not grant a final and perpetual injunction in patent cases, when the answer denies the validity of the patent, without sending the parties to law to have that question decided. But, even there, the rule is not absolute or universal. It is a practice founded more on convenience than necessity. It always rests on the sound discretion of the court. A trial at law is ordered by a chancellor to inform his conscience; not because either party may demand it as a right, or that a court of equity is incompetent to judge of questions of fact or of legal titles. In the courts of the United States, the practice is by no means so general as in England, or as it would be here, if the trouble of trying issues at law devolved upon a different court. Cases involving inquiries into the most complex and difficult questions of mechanics and philosophy are becoming numerous in the courts. Often questions of originality and infringement of patents do not depend so much on the credibility of witnesses or the weight of oral testimony, as on the application of principles of science and law to admitted facts. It is true that, in matters of opinion, both mechanics and learned professors will differ widely. But still, the question is not to be decided by the number, credibility, or respectability of such witnesses, but by the force and weight of the reasons given for their respective opinions. It is no reflection on trial by jury to say, that cases frequently occur, in which ten out of twelve jurors do not understand the principles of science, mathematics, or philosophy, necessary to a correct judgment of the case. Besides, much of the time of courts is lost, where twelve men will not agree upon a verdict, or where, when they have agreed, the conscience of the chancellor, instead of feeling enlightened, rejects it altogether. A select or special jury of philosophers, if they could be got, would, perhaps, not prove more satisfactory, or obviate the difficulty. In a late case, involving the validity of Morse's telegraph patents, which was heard in Philadelphia, a final injunction was decreed without a verdict to establish the patents; and many other cases might be cited from other circuits, if necessary, in support of the practice, showing that the courts of the United States do not always consider it a proper exercise of their discretion, to order such issues to be tried at law, before granting a final injunction. In the present case, there are many reasons why the court will not thus exercise their discretion: 1st. Because this case has been set down for final hearing, on the exhibits and proofs, without any motion or order of the court for such an issue; 2d. After a patient hearing of very able counsel, and a careful consideration of the testimony, the court feel no doubt or difficulty on these questions, which would be removed or confirmed by a verdict; 3d. It would require three or four weeks, at least, to try this case before a jury, if this library of testimony were read to them, and at least as many months, if the witnesses were examined *viva voce*, as they probably would be; and, after all this expenditure of time and labor, it is even more than probable that, from the confusion created by the great length of the testimony and argument in court, or the force and effect

of those urged from without, no verdict would be obtained, and most certainly none that would alter the present conviction of the court.” The answer of the defendants, in *Goodyear v. Day*, not only denied the allegations of the bill, but concluded by praying “a trial by jury of the various issues of fact formed by it.” The defendant did not however, make any special motion for the trial of such issues by a jury; and this, it has been seen, was considered by the court as a prominent ground for proceeding to the final determination of the cause without a trial at law. In this case, no prayer for a

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trial by a jury is to be found in the answer, and no special motion for such trial has been made.

The nature of the patent right in this case and the character of the evidence by which it is to be established or overthrown, are such that I am quite satisfied that, upon the most important questions involved, the conclusions of a judge, based upon repeated examinations and comparisons of depositions carefully taken, reduced to writing, and read and approved by the deponents, after a full cross-examination, would, as a general rule, be more accurate and reliable than the verdict of a jury, which must, of necessity, be based upon the hasty oral examination of witnesses at a circuit, and be made, in the usual manner, after only a brief consultation. It is true that, in regard to the ordinary transactions of life, with which jurors are more familiar, the verdict of a jury is, and ought to be, more relied upon than the opinion of a judge, formed during the progress of a trial; but, I am not satisfied that an ordinary jury would be the best tribunal to decide upon the questions of fact in this case—questions upon which the very full and yet conflicting testimony of the scientific experts may exercise a very considerable, if not a controlling, influence. This testimony ought to be attentively examined, and the testimony of each witness carefully compared with that of every other, and the general facts of the case; and the whole evidence ought then to be made the subject of deliberate consideration. This can be better done by a judge in vacation than by a jury at term; and, as a general rule, a judge is better qualified than an ordinary jury to investigate and determine disputed questions depending in part on the principles and facts of chemistry and of natural philosophy. The case will, therefore, be examined and disposed of without requiring the intervention of a jury.

<sup>2</sup> [In disposing of the case upon its merits, we shall first consider the specification and claim of the complainant's patent, with a view of determining the character and extent of the invention patented.

[The first claim is in these words: “What I claim as my invention, and desire to secure by letters patent, is the use of a solution of caustic soda (NaO) in a compartment of a rotary vessel, separate from that which contains the steam heat, substantially as described.” This claim is, in one sense, a very broad one, as it does not (unless limited by the words “substantially as described”) restrict the claim to the use of a solution of caustic soda of any indicated degree of strength, to the use of an extraordinary degree of heat, or to any

particular form or mode of construction of a comparted rotary vessel, if its construction be such as to make it suitable for the purpose indicated. In another respect it may be quite limited, for (even when considered alone and without reference to the claim which immediately follows it), it is at least doubtful whether it extends to any use of the solution indicated, except in a vessel with compartments so constructed and arranged that the solution is used in a compartment separate and distinct from that which contains the steam heat by which the solution is to be heated. This claim is substantially for a process, that is for the use of a solution of caustic soda (NaO) in a compartment of a rotary vessel, separate from that in which the steam heat is confined when applied for the purposes indicated; and looking to the whole specification and the claims annexed, and especially to the distinct language which expressly limits the process thus claimed to the use of a solution of caustic soda in a compartment of a vessel separate and distinct from another compartment, by means of which the required steam heat is confined and applied, and to the more general and comprehensive terms of the claim which immediately follows it, we are inclined to think this claim can not be held to extend beyond the use of a vessel with separate compartments for the material to be heated, and for the steam heat used in the process substantially as specified. Such a vessel the defendants do not use, and, therefore, do not infringe the first claim of the patent. It was urged by the counsel for the plaintiff that the use of the designated solution, in a rotary boiler without compartments and heated by a fire under or around the same, was but the substitution of fire heat as a well-known equivalent of the steam heat used by the patentee; but as neither degree of heat nor strength of solution is specified in this claim, and as it, in terms, expressly requires the use of steam heat in one compartment of a vessel with two or more compartments, in the other of which the material to be heated is to be placed, we shall hold that this claim of the plaintiff's patent does not extend to, and is not infringed by, the use of the solution of caustic alkali, in a simple, single chambered rotary boiler, heated by fire heat, under or around the same, as practiced by the defendants. And this construction of the first claim of the patent is, we think, very clearly indicated by the different character of the second claim, which is broader in its terms, and embraces the use of the process invented by Mellier without regard to the mode of applying the heat, or the particular form, or construction, or arrangement of the rotary boiler or apparatus by which the process may be carried on for the purposes indicated.

[The second claim in the plaintiff's patent is in these words: "I also claim the within described process for bleaching straw, consisting in boiling it in a solution of pure caustic soda (NaO) from 2° to 3° Baume, at a temperature of not less than 310° Fahrenheit

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heit, after it has been soaked and cleansed, and before submitting it to the action of chloride of lime, from 1 to 1 ½ degrees, substantially as described." It is evident that the process thus claimed includes only the specified boiling of the material treated, in the solution and under the conditions specified, and that the prior soaking and cleansing of such material, and subsequent treatment of it, by submitting it to the action of chloride of lime, as specified, are not a part of the process thus claimed. The soaking of the straw or



other material to be heated, like the cutting of it into short lengths and freeing it from dirt and dust; the subsequent washings of the material in hot and cold water; and the bleaching of the cleansed fiber by a comparatively small quantity of chloride of lime, after steeping it in warm water acidulated by sulphuric acid, are not portions of the process claimed and patented; for the patentee, at the commencement of the specification, says his "improvement consists in subjecting straw, or other such fibrous materials, to a pressure of at least seventy pounds on the square inch, when boiling such fibrous matters in a solution of caustic alkali;" and the claim, as has been seen, states the process for bleaching straw claimed in the second claim, as consisting in boiling it, "under the presented conditions, after it has been soaked and cleansed, and before submitting it to the action of a solution of chloride of lime," etc.: thus limiting the process to the boiling, under the conditions thus indicated. The real discovery of Mellier, the main idea, the spirit or principle of his invention, was, that the known effects of a solution of pure caustic soda, which had been previously advantageously used for boiling straw and other fibrous materials of similar character and texture, in open vessels, in which the heat could be raised only to 212° Fahrenheit, might, by the use of a much higher degree of heat, not less than 310° Fahrenheit, be advantageously and greatly increased; while the lessening of the time the fiber was subjected to the action of the caustic alkaline solution, and the use of the weaker solution, which could thus be advantageously used, would be less injurious to the fiber, as well as more economical in its use and application. This was the discovery or principle to be developed and practically applied, and he embodied that principle and arranged and described the means of its practical application, for the purposes specified in the mode and manner particularly described in his specification. This mode, he says, he prefers; and he recommends a particular construction of the boiler as proper to be used in the practical application of the leading idea and principle of his invention. But, aware that inferior forms may be devised by any mechanic, and that superior forms and modes of construction and application may be devised after the use of his process has become familiar, he very wisely makes his second claim broad enough to cover his actual discovery and invention, irrespective of the particular form or construction of the vessel in which the boiling process might be carried on. The invention and patent are in some respects like those of Neilson for the application to the blast furnace, of air, heated to an extreme degree, in a separate vessel intermediate the blowing apparatus and the point where it enters the furnace. In *Neilson v. Harford* [8 Mees. & W. 803], the learned Baron Alderson, in respect to Neilson's invention and patent, said: "The blowing apparatus was perfectly well known, the heating of air was perfectly well known as applicable to blast furnaces; then what he really discovered is, that it would be better for you to apply air heated up to a red hot heat, or nearly so, instead of cold air, as you have hitherto done. That is the principle, that is the real discovery; but in order to take out a patent you must have an embodiment of the principle, and his embodiment of the principle is the heating of air in a separate vessel immediately between the blowing apparatus and the point where it enters the furnace. Then he says: 'I do not mean to claim any shape in which it is done; it may be done in a vessel of any shape, provided only you have a vessel of such a shape, and fire so applied as that, in the intermediate spaces between the blowing apparatus and the furnace, the air arrives at the red heat.'" Webst

Pat. Cas. 337. And see the opinion of Lord Justice Clerk Hope on the same patent. *Id.* 683–685.

[It was strongly urged by the defendant's counsel that “the language of the second claim excludes the idea of every temperature exceeding 310° Fahrenheit;” and it was said, “The term ‘of not less than 310° Fahrenheit’ has no reference to higher degrees. It names a specific temperature and provides against less, without including more. The phrase ‘not less than’ fixes a minimum limit without regard to a maximum.” If this position is well taken and can be maintained, in all its strictness, then most surely the patentee is limited to the precise heat of 310°, and any one may use what is substantially the patented process with impunity, provided the heat employed is a few degrees above or below the standard thus set up. But we think this position can not be maintained. It is entirely clear that such was not the intention of the patentee or of the person who drew this specification, for neither could have intended so to limit the claim of the patent as to render it of no practical value. The discovery made was that the higher degrees of heat and pressure could produce the desired result; and, while the minimum heat requisite to produce a really beneficial result was stated, no upward limit was fixed so long as the process carried on by that degree of heat was in fact a boiling process, under the conditions, in

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substance, stated in the specification. But it was urged that the Mellier patent was, at all events, limited to the pressure not exceeding eighty-four pounds to the square inch, because, in his specification, he says that by the use of that pressure he can reduce considerably the proportion of alkali. We think this language does not limit the claim, and that, notwithstanding this language in the specification, the proper construction of the claim is as above stated. Nor do the statements in the specification, that the patentee prefers “that the boiling should be carried on at a temperature to produce at or above eighty pounds pressure on the square inch in the boiler where are the fibrous materials to be acted upon,” that “so high a temperature is not absolutely necessary,” and that he has “found by experiment that it is essential that a temperature equal to seventy pounds on the square inch should be employed,” impose any specific upward limit to the degree of heat and pressure. It was urged that the statement that a pressure of eighty pounds was unnecessary, very clearly limited the patentee to that pressure; but we understand that the patentee simply states the fact that so high a pressure is not absolutely essential to a beneficial result, but that he prefers a pressure of eighty pounds or more to the square inch, and because by the increased pressure a better result could be produced or a saving of time or alkali could be effected. Nor do we consider the description of the Mellier process contained in the specification “confused, inconsistent, indefinite, ambiguous, or defective.” It is sufficiently clear, precise, and intelligible, and though a higher heat than that then used by the patentee, or a longer boiling than he recommends may be requisite to produce the very best results in the use of the patented process, we are satisfied from the proofs, that boiling straw in accordance with that process, for the shortest time, and at the lowest pressure indicated in the specification, will produce a useful result, one better

than that obtained in the same time and at the same cost by the use of the “open tub process.”

[This brings us to the consideration of the question of novelty in respect to the process referred to in the second claim of the Mellier patent. The Coupier & Mellier patent had introduced the practice of boiling straw, and other fibrous materials, in a pure caustic alkali (free from the presence of lime), for the purpose of separating the coloring matter and associate constituents or proximates, from the white fiber, or cellulose; and this process of Coupier & Mellier appears to have been at the date of its introduction, and until the subsequent discovery and invention of Mellier, the most advanced stage of the arts as applied to the purpose of manufacturing white paper from straw or other refractory material requiring the same treatment. It is true that the rotary boiler of Spafford had been invented in 1840, and had been used before Mellier's invention in the manufacture of paper from other materials, and sometimes, perhaps, from straw also for boiling stock, under a higher pressure than that used in the open tub process, but we do not understand that Spafford invented or patented, or supposed that he had invented any new process, but simply a form and construction of boiler, in which, by turning of the boiler, the steam and the digesting liquid, whatever it might be, were effectually mingled with the charge, or material to be heated, and in which the material heated was thus acted upon, by the digesting liquid and heat, in a more thorough and equable manner, and with greater economy of heat and time, than when boiled in stationary open tubs or other stationary vessels. As we understand his specification and claim, no intimation is given that the digesting liquid should consist of a solution of pure caustic soda of any particular degree of strength; on the contrary, he speaks of the digesting liquid as a solution of potash, soda, or lime in water, nor do we understand that he indicated any particular degree of heat, or any pressure equal to 310° Fahrenheit, or had discovered or intended to intimate that a high degree of heat was useful or desirable. His only object was to produce, by the rotary movement of the vessel containing the charge and the digesting liquid, the complete intermingling of the two and the perfectly equable action of the digesting liquid upon every portion of the material heated. There is certainly some testimony, though it is not of the most conclusive character, to show that rope and other refractory material had been boiled in rotaries at different pressures above seventy pounds, prior to the invention of Mellier, but the liquid used for such boiling was not a solution of pure caustic alkali but contained lime in considerable quantity, and the extraordinary degree of heat used was not regularly and uniformly attained and kept up, but was rather casual and incidental. We think the whole testimony shows that the parties directing or using this pressure had no knowledge of the utility of the particular process patented by Mellier, nor any conception of the advantages resulting from the use of pure caustic alkali and the high temperatures which he has recommended.

[That paper makers and bleachers had, at the date of Mellier's invention, a general knowledge that the boiling of the material to be bleached, or prepared for bleaching, in an alkaline solution, gave efficiency to the action of the alkali upon such material, is certain; but the full and accurate knowledge of the state of the art before possessed by Messrs.

Hays and Wells, the defendants' experts, and the long-continued experiments of the one aided by the advice of the other, for the purpose of discovering an economical

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and satisfactory mode or process of making white paper from straw and other similar materials, did not enable them to reach that result, or lead them to adopt the process described in Mellier's patent. They abandoned their experiments. They failed to produce white paper from straw with such economy, of such quality and price that its manufacture and sale would give profitable employment to the labor and capital required for that purpose, and neither they nor any of the several manufacturers of paper who have been examined as witnesses in this case were aware of the benefits to be derived from the use of that extreme heat, during the boiling process which Mellier's process requires. The Coupier & Mellier process was introduced into this country in 1853; and although the invention of Spafford in 1840 of the rotary boiler for boiling rags, and its subsequent use, had furnished the hint and the means for boiling at much higher temperatures than could be obtained in open vessels, neither the defendants' expert in his experiments nor the manufacturers or the workmen in the paper mills of the country, ever attempted to use the extraordinary heat now used, or the useful process invented and patented by Mellier. Spafford's rotary had been in use over fifteen years; the Coupier & Mellier process had been in use more than three years, but the Mellier process was nowhere known or in use in the manufacture of white paper from straw until after its invention was made known to Buchanan & Palser, and probably Howland, late in 1856. Until the defendants, in 1857, entered upon its use, the open tub process of Coupier & Mellier was still in general use when white paper was attempted to be manufactured from straw, and it was not until the French patent of Mellier was exhibited that this process was known in this country. The defendants commenced the manufacture of straw paper in 1857, and on November 22, 1859, they obtained a patent for an improvement in the manufacture of paper pulp; and in their specification they describe a process of boiling straw, in which they say they employ sixty gallons of caustic alkali, of a strength indicating  $3\frac{1}{2}^{\circ}$  to  $3\frac{3}{4}^{\circ}$  of Baume to every one hundred pounds of straw in a rotary steam boiler, and raise the pressure by fire below the boiler to, from one hundred, to one hundred and thirty pounds, and maintain that pressure for four hours. In this specification, they say: "A well-known method, patented by letters patent, No. 17,387" (the same under which plaintiff claims), "of reducing straw to pulp is to employ a solution of caustic alkali, of a strength indicating from  $2^{\circ}$  to  $3^{\circ}$  Baume, seventy gallons of the solution to one hundred pounds of the cut straw, the whole being placed in a boiler and boiled under a pressure of not less than 84 pounds for about three hours, but we find in practice that the above method does not sufficiently disintegrate the straw, nor does it sufficiently dissolve or remove the woody, aluminous and silicious matters, from the fibrous portions," etc. And again: "On comparison of the pulp produced from straw by our method, and that made after the mode described in the patent before mentioned, a very marked difference in appearance is observable in favor of our invention. The paper made from the pulp above mentioned also presents the same striking difference in favor of our improvement." This specification seems to show that they had been using the process of Mellier, for it is almost certain upon the proofs in this case, that

in that way alone could they have made the discovery and comparison referred to. The specification says: "We find in practice," etc., an allegation somewhat inconsistent with some of the allegations of the defendants' answer, and with some of the positions maintained by their counsel on the argument. Upon the whole evidence in the case we think there is scarcely any reason to doubt that the process now used by the defendants was founded upon the Mellier patent, and the knowledge of the process which they obtained from Buchanan as shown by the testimony of Godard, of Parks, and of Beaumont; and that the process now used by the defendants is an infringement of the patent held by the plaintiff.

[It is insisted that the defendants do not use the Mellier process, and various grounds are taken upon which to maintain this position. It is said that Mellier steeps the straw in warm water, and the defendants do not; and that Mellier uses steam heat exclusively, while the defendants use fire heat almost exclusively. The answer to these allegations is that the steeping in warm water is no part of the process patented, and that under the second claim of the Mellier patent it is immaterial whether the boiling is produced by steam heat or fire heat. It is further insisted that Mellier separates the alkali from the steam heat to prevent its being diluted, while the defendants admit to the solution all the steam they use, and that Mellier uses seventy gallons of the alkaline solution, from 2° to 3° Baume, while defendants use sixty or sixty-five gallons at 3½° to 3¾° to each one hundred pounds of straw. The answer to this argument is that under the second claim of the Mellier patent, the admission or exclusion of the heated steam, as stated, is immaterial, and that the evidence satisfactorily shows that by the admission of steam into the rotary of the defendants, the quantity of alkaline solution used by them is increased and its strength diminished until it becomes both in strength and quantity substantially like, if not identical with, that which the plaintiff's patent states is to be employed in the process of Mellier. It is also insisted that Mellier's specification states that he boils at seventy pounds pressure, and regards a higher pressure as unnecessary except for saving alkali, while the

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defendants boil at one hundred and thirty pounds pressure to improve the product; and that Mellier boils about three hours, though a much longer boiling is necessary to produce a fair result, provided the strength of alkali and degree of pressure are no greater than he recommends, while the defendants boil four hours. The patent of Mellier, it has been seen, does not limit him to a pressure of seventy pounds or of eighty-four pounds, and if the boiling for three hours produces a beneficial result, such as the patent indicates, the defendants can hardly escape the consequences of infringement by continuing the boiling for an hour afterward in order to produce a better result. Even if it be true, as claimed, that a longer boiling and greater pressure produce better results than can be produced by boiling only three hours with a pressure of seventy pounds or even of eighty-four pounds, we see no reason for holding that there is no infringement of the Mellier patent, when the boiling, which he recommends should continue about three hours (although this time is not specifically mentioned in the claim), is continued for an hour longer than he

recommends. In short we think the patent of Mellier is valid; that he is the original and first inventor of the process claimed therein; that his invention is useful and that the process used at the mills, owned and operated by the company in which the plaintiff is a member, and at the mills of the defendants, is in substance Mellier's process, as claimed in the second claim of his patent, and that the plaintiff is entitled to a permanent injunction, and an account as prayed in his bill.

[In reaching this result, we have not failed to consider the defendants' patents and their effect. Their patent of November, 1859, referred to in the plaintiff's bill, by the terms of its specification, expressly excludes from its scope and operation the process described in the plaintiff's patent, and it was probably granted by the patent office on the ground that the claim made, taken in connection with such disclaimer, did not conflict with the claims of the Mellier patent. This conclusion was probably based upon the facts that the strength of solution in Mellier's was from 2° to 3° Baume, and its quantity about seventy gallons to the one hundred pounds of stock, while that in the defendants' process was to be from 3½° to 3¾° Baume, and its quantity sixty gallons to the same quantity of stock; and that a higher degree of heat was recommended, differences which were probably considered sufficient to make the two processes substantially different. In considering the process of this patent of the defendant, in connection with the Mellier process, and the defendants' present practice, it is to be remembered that the specification directs that this stronger solution be placed in a boiler and heated entirely by a fire applied below it, and without any introduction and condensation of steam from any other boiler to increase the quantity and diminish the strength of the alkaline solution used, as has been since practiced by the defendants. The specification of Mellier also recommended a construction of the boiler which prevented any increase of quantity or diminution of strength in the use of his process; and this was desirable if the weaker solution of alkali recommended by him was to be used. The proof shows that by the introduction and condensation of steam from another boiler, the alkaline solution in defendants' rotary is increased about twenty per cent. in quantity, while its strength is consequently diminished until it is not beyond 3° Baume; thus making its quantity and strength substantially that required by the Mellier process, and the strength much less than that recommended in the defendants' patent of 1859. This shows that the defendants do not now in fact use only sixty gallons of the alkaline liquid to the one hundred pounds of stock, or use that at the higher strength required by their first patent; and, doubtless, for the reason that their present process (in substance the Mellier process) gives a better result. The patent to the defendants granted March 20, 1860, we regard as in substance a patent for the staple fiber produced by the process patented in November, 1859, and as standing or falling with that patent. The patent of July 3, 1860, describes at great length an ingenious and useful apparatus, and the particular mode or process adopted in its use for the purposes indicated. This patent does not claim the apparatus described (although if it was invented by the defendants, or either of them, it is probably covered by some other patent), and the specification is not of such a character as to suggest that the claim was in conflict with that of the Mellier patent. The entire process described embraces the use of apparatus entirely different from that particularly specified in the Mellier patent, and the claim of this patent was more likely to be allowed without the consideration of the Mellier patent than the claim of the

patent of November, 1859, above referred to. It is not shown that the question of interference in respect to these patents of the defendants and the Mellier patent was ever considered by the patent office, and if it was, there is no proof that the facts shown in this case were then presented. Our judgment is that these patents of the defendants ought not to prevent a decree for the plaintiff in this suit. There will be a decree for a permanent injunction, and an account substantially as prayed for in the plaintiff's bill.

[A decree was entered in accordance with the opinion, but in April following the following order was made:

[On reading and filing affidavits and notice

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of motion for a stay of injunction in this cause, and also affidavits in opposition thereto, and after hearing Mr. John B. Gale, of counsel for defendants, and Mr. Joel Tiffany, of counsel for the plaintiff, it is hereby ordered that the injunction heretofore issued in this cause (and stayed and suspended by an order of one of the judges of this court to allow this motion to be heard), be further stayed and suspended until the further order of this court, or until the hearing and decision of this cause upon the appeal heretofore taken therein, in case such appeal shall be held to be well and properly taken from the decree heretofore made by this court in this cause, or if said appeal shall be held by the supreme court of the United States to have been prematurely taken, then that such injunction be stayed and suspended until the expiration of twenty days after the report of the master or commissioner under the order of reference directed by the decree of this court in this cause shall be confirmed by the order or decree of this court, or under the general rules and practice of this court in equity cases, and if another and proper appeal to the supreme court of the United States shall then be taken to the final decree in this cause within ten days after the said master's or commissioner's report shall stand or be confirmed, then that said injunction shall be stayed and suspended until ten days after the decision of the said supreme court on the said appeal; provided, that this order shall be void and of no effect, unless the defendants, within twenty days after the entry of this order, shall file with the clerk of this court their bond in the penalty of ten thousand dollars, with two sufficient sureties, who shall make affidavit that they are respectively worth the sum of ten thousand dollars each over and above all their debts and liabilities, conditioned to pay to said plaintiff all damages which he may sustain or in any way suffer or be entitled to by reason of any infringement of the patent under which the plaintiff prosecutes in this suit or of his rights as finally determined and established in this cause, and, also, unless the defendants shall, within the twenty days next preceding the expiration of every period of four months after the entry of this order, file a new bond bearing date within said twenty days, with like penalty, sureties, and conditions. And the said plaintiff is to be at liberty to apply to this court or any judge thereof, in vacation, for a modification or discharge of this order, or for further or better security if he shall deem it expedient to do so.”<sup>2</sup>

[NOTE. For other cases involving this patent, see American Wood-Paper Co. v. Glen's Falls Paper Co., Cases Nos. 321, 321a; Same v. Fibre Disintegrating Co., Case No 320; Same v. Heft, Id. 322.]

<sup>1</sup> [Reported by Hon. Samuel Blatchford, District Judge, and by Samuel S. Fisher, Esq., and here compiled and reprinted by permission. Statement and opinion, except as otherwise noted, are from 5 Blatchf. 151. Syllabus, specifications, and opinion on the merits from 2 Fish. Pat. Cas. 341.]

<sup>2</sup> [From 2 Fish. Pat. Cas. 341.]

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