

NEW YORK AIR-BRAKE CO. et al. v. WESTINGHOUSE AIR-BRAKE CO.

(Circuit Court of Appeals, Second Circuit. May 28, 1895.)

1. PATENTS—INFRINGEMENT—AIR BRAKES.

The Westinghouse air-brake patent, No. 360,070, held infringed, as to claims 1, 2, and 4; affirming decree for preliminary injunction. 65 Fed. 99.

2. SAME.

A decree granting a preliminary injunction against infringement of claim 1 of the Westinghouse air-brake patent, No. 376,837, reversed, on the ground that the question of infringement was too doubtful to be resolved in favor of complainant on a motion for a preliminary injunction.

Appeal from the Circuit Court of the United States for the Southern District of New York.

This was a bill by the Westinghouse Air-Brake Company against the New York Air-Brake Company and others for infringement of letters patent Nos. 360,070 and 376,837, granted to George Westinghouse, Jr., March 29, 1887, and January 24, 1888, respectively, for improvements in air-brake mechanism. The circuit court granted a preliminary injunction to restrain infringement of claims 1, 2, and 4 of the former patent, and claim 1 of the latter. The opinion of Judge Lacombe in the court below is reported in 65 Fed. 99. Defendant appealed from the interlocutory order so granted.

J. E. Maynadier and F. P. Fish, for appellants.

Kerr & Curtis, J. Snowden Bell, George H. Christy, and Frederic H. Betts, for appellee.

Before WALLACE and SHIPMAN, Circuit Judges, and TOWNSEND, District Judge.

PER CURIAM. We agree with the court below that the defendant's apparatus is an infringement of the first, second, and fourth claims of patent No. 360,070, and deem it unnecessary to add anything to the opinion of Judge Lacombe. The question whether the apparatus is an infringement of the first claim of patent No. 376,837 is too doubtful to be resolved in favor of the complainant upon a motion for a preliminary injunction, and should be reserved for disposition upon the final hearing of the cause. So far as the order appealed from allows an injunction for the infringement of this claim, it should be reversed; otherwise, it is affirmed. Ordered accordingly.

KENNEDY v. SOLAR REFINING CO. et al.

(Circuit Court, N. D. Ohio, W. D. September 28, 1895.)

No. 1,058.

1. JURISDICTION OF FEDERAL COURTS — DIVERSE CITIZENSHIP — DEFECTIVE AVERMENTS—WAIVER.

Where the jurisdiction depends upon the diverse citizenship of corporations, defective averments in regard thereto are waived by the filing of an answer, and the taking of testimony by both parties.

2. PROCESS PATENTS—INFRINGEMENT OF COMBINATION.

A process patent involving a combination of elements is not infringed unless every element is employed.

3. SAME—LIMITATION BY ALTERATION OF SPECIFICATION.

Where, in compliance with a suggestion of the examiner, an applicant for a process patent alters his specifications so as to state specifically the mode of using his ingredients, he cannot thereafter, unless he is a pioneer inventor, invoke the doctrine of equivalents to cover processes which do not use all the features so described.

4. SAME—EVIDENCE—PROOF OF EXPERIMENTS.

Experiments to determine the results of a process involving the use of chemicals, in order to be satisfactory, should either be performed in the presence of the court, or the evidence should be entirely satisfactory that the materials used were genuine and pure, and that the process was followed.

5. SAME—PLEADING—NOTICE OF PRIOR PATENTS.

It is not necessary for defendants, in their answer, to give notice of prior patents which they intend to rely on, not as anticipations, but merely as showing the prior state of the art.

6. SAME—PROCESS FOR DESULPHURIZING OILS.

The Kennedy patent, No. 370,950, for a process for desulphurizing and purifying petroleum oils, *held* void because it does not accomplish the result sought; and, assuming its validity, *held* not infringed.

This was a bill by Daniel M. Kennedy against the Solar Refining Company and Standard Oil Company for alleged infringement of a patent for the process of desulphurizing and purifying petroleum oils.

T. E. McDonald, for complainant.

John H. Doyle and Wm. Bakewell, for defendants.

RICKS, District Judge. This is a bill filed by the complainant, claiming a patent for a new and useful process for desulphurizing and purifying petroleum oils, which patent is dated October 4, 1887, being patent No. 370,950. The defendant corporations have filed a joint answer denying the validity of complainant's patent and denying infringement. A replication was duly filed, and the case was prepared for hearing. A large amount of testimony was taken by both parties.

The defendants, notwithstanding their answer, in their brief, contend that the court has no jurisdiction of the case because of the inartificial pleading in the complainant's bill with reference to the allegations of diverse citizenship. The bill avers that the complainant is a citizen of the dominion of Canada, and "brings this his bill into court against the Solar Refining Company, which is a corporation created and existing in due form of law within the said Northern district of Ohio, and the Standard Oil Company, also a corporation created and existing in due form of law in the said state of Ohio." These averments as to the citizenship of the defendants are wholly insufficient to confer jurisdiction upon the court, and if a demurrer had been interposed the same would have been sustained. But the defendants having answered, and all parties having gone to great expense in the taking of testimony, it is now too late for the defendants to make this contention. If the objection related

to the want of jurisdiction because of the subject-matter, the court would pass upon such question at any time, without reference to the state of the pleadings. But an objection on account of diverse citizenship may be waived by answer, and the court is of the opinion that in this case the defendants have made such waiver, and it is now too late to make the contention relied upon in their brief.

The next contention made by the defendants is that the complainant has joined as defendants two separate corporations, charging both of them with the infringement of the patent in suit, and has not therein alleged, and does not pretend, and has made no attempt to prove, that they are, in any sense, joint infringers, or that either of them had any connection with, or had taken any part in, the alleged infringement of said patent, with the other. This contention is disposed of by the views which the court shall hereafter state with reference to the validity of this patent and the allegation of infringement, so that it is not necessary to give this contention any further consideration at this time.

The patent sued upon is what is known as a "process patent," and it is described in the patent as a process to desulphurize and purify petroleum (hydrocarbon) oils. The patentee claims his process to be as follows:

"I take of sulphate of copper (blue vitriol), caustic soda, and chloride of sodium (common salt) about equal quantities, and dissolve the same together in water. I prefer to first dissolve the copper and chloride of sodium in water, and then the soda, and mix the two together, when the copper will be precipitated as oxide of copper. This solution, with its precipitate, is then put in the still with the oil, and when the oil boils the precipitate (oxide of copper) dissolves, and combines with the sulphur of the oil, forming sulphide of copper, which, with the greater portion of the solution remaining in the oil, settles to the bottom when the oil is cool, and can be drawn off. The oil then, which still contains a trace of the soda, copper, and salt held in combination mechanically, is distilled, which will cause the ingredients to separate and settle out of the oil. Instead of distilling the oil to remove the trace of the soda, copper, and salt, they may be washed out with water, sulphuric acid, and soda. This will cause the oil to be left pure and free from sulphur, so that in burning in a lamp the oil will not cloud the chimney of the lamp, nor crust the lamp wick, nor produce such offensive odor, and will give a bright and clear light. The proportion of the solution to be used with the oil which I have found to answer best is as follows: One pound of each,—sulphate of copper (blue vitriol), caustic soda, and chloride of sodium (common salt),—dissolved in about two gallons of water, for every forty gallons of oil to be treated. Having thus fully described my invention, I claim as new, and desire to secure by letters patent: (1) The process of combining the sulphur in the oil with the metallic matter contained in a solution of about equal quantities of sulphate of copper (blue vitriol), caustic soda, and chloride of sodium (common salt), and then separating such combined metallic matter and sulphur from the oil, substantially as and for the purposes herein specified. (2) In the process herein described of desulphurizing and purifying petroleum (hydrocarbon) oils, first preparing a solution of sulphate of copper, caustic soda, and chloride of sodium, in or about the proportions specified, in water, then mixing said solution with the oil, and heating the whole in a still, and subsequently separating from the oil the combined metallic matter of the solution and sulphur in the oil, as set forth."

A process patent, when involving a combination of different elements, is similar to a patent for a combination of mechanical devices. No infringement of the latter can be sustained unless every one of

the constituent elements is employed. In the case of *Prouty v. Rugles*, 16 Pet. 336, Chief Justice Taney said:

"The use of any two of these parts only, or of two combined with a third which is substantially different, in form or manner of its arrangement and connection with the others, is, therefore, not the thing patented. It is not the same combination if it substantially differs from it in any of its parts."

The same principle is announced in the case of *Vance v. Campbell*, 1 Black, 427, and *Rowell v. Lindsay*, 113 U. S. 97, 5 Sup. Ct. 507; so that it is now well established that a claim for the combination of three elements is not infringed by the use of two only, though the third is useless, for the patentee must stand by his claim. *Royer v. Belting Co.*, 28 Fed. 850. And similarly, in analogy to the law governing the infringement of combination patents, it is held that the infringement of a patented art consists only in the performance of all the acts of which it is composed, or their equivalents, in the manner and in the order in which they are claimed in the patent. 3 Rob. Pat. § 925. A process patent is described by Mr. Justice Bradley, in the case of *Cochrane v. Deener*, 94 U. S. 780, as follows:

"A process is a mode of treatment of certain materials to produce a given result. It is an act or series of acts performed upon the subject-matter to be transformed and reduced to a different state or thing. * * * In the language of the patent law, it is an art."

The application of this rule of infringement of a combination of mechanical devices to a process patent is well illustrated by the decision of the supreme court of the United States in the case of *Klein v. Russell*, 19 Wall. 433. In that case the original patent described a process for the treatment of leather by the use of fat liquor, applied when heated near the boiling point. A reissue patent sought to recover the process by the use of the fat liquor whether hot or cold, but the supreme court held that, if the reissue patent was to be construed to cover the fat liquor whether heated or not, the reissue was void. The same rule was applied in *Arnold v. Phelps*, 20 Fed. 315, which was a process for treating coffee berries. The plaintiff cannot complain of this construction of the law, for he has limited his patent by his specification and claims to the particular process described. Not only did he limit it by the process described in his claim and in his specifications as set out in the patent, but by his proceedings in the patent office he made this limitation still more explicit. The application was filed on the 10th of March, 1887. On the 18th of May, following, the patent office examiner advised him that the process of removing the chemicals and sulphur combined therewith from the oil was insufficiently described. The examiner said:

"The gist of the invention is the employment of a metallic salt (formed in this case by the action of the alkali on the salt of copper), which salt forms an insoluble sulphide with the sulphur present in the oil. The use of such salts in general is shown in U. S. patent No. 299,324, and English patent No. 1,211."

This action showed clearly that the patent office understood the process proposed to be patented by Kennedy to consist, not in the use of metallic copper, nor of oxide of copper, but of a special compound formed by the action of the alkali and the blue vitriol (sulphate of

copper), so that the presence of the alkali (soda) with the sulphate of copper is absolutely required. The applicant then alters his specification, stating specifically the mode of using the alkalis (caustic soda and common salt), and adds the following comment on the action of the patent office:

"As to the merits of the case, the references fail to show oil purified—that is, the sulphur removed therefrom—by first treating the oil with sulphate of copper, caustic soda, and chloride of sodium, and then separating the metallic matter therefrom, as covered by applicant's claims."

The patentee was thus limited to the use of caustic soda and common salt, with blue vitriol. The legal effect of these proceedings is that the patentee cannot now claim any broader construction of his patent than that which was thus stated as the gist of his invention by the patent office, and to which he assented. In *Roemer v. Peddie*, 132 U. S. 313, 10 Sup. Ct. 98, the supreme court say:

"This court have often held that when a patentee, on the rejection of his application, inserts in his specification, in consequence, limitations and restrictions for the purpose of obtaining his patent, he cannot after he has obtained it, claim that it shall be construed as if such limitations and restrictions were not contained in it;" citing many cases.

In the case of *Smith v. Gas Co.*, 42 Fed. 145, the court says:

"The above citations from Mr. Smith's written communications to the commissioner, upon the faith of which the office acted, cannot now be excluded from consideration. They, in effect, restricted his application to a process in which hydrocarbon is decomposed by means of heated natural gas."

Having thus restricted his patent to the precise process described, it becomes important to ascertain the state of the art at the time the application for the patent was made. For this purpose the defendants offered in evidence a large number of prior patents granted for similar purposes. The complainant contends that these patents are not proper evidence, and cannot be considered by the court, because the defendants did not give notice in their answer that they relied upon such patents. Such notice is necessary only when the defendant relies upon such patents as anticipating the plaintiff's invention. When prior use is claimed, the statute requires that the plaintiff shall be given notice in the answer of the name of the patentee, and the number of the patent under which such anticipation is claimed. But, merely for the purpose of showing the state of the art, proof may be offered without any prior notice in the pleadings. For the purpose, therefore, of enabling the court to construe the patent in suit, and ascertain its proper scope and limitations, the proof of the prior state of the art is perfectly competent. In *Vance v. Campbell*, 1 Black, 427, the court says:

"Several exceptions were taken to the admissibility of evidence offered by the defendants, but it was competent and relevant, as showing the state of the art at the date of plaintiff's invention. No notice was necessary in order to justify the admission of evidence for this purpose."

In *Eachus v. Broomall*, 115 U. S. 429, 6 Sup. Ct. 229, Justice Matthews said:

"A comparison of the two patents requires an interpretation of the original patent in the light of the state of the art at the date when the application for

it was filed. And we have the material for ascertaining its meaning in that view by means of the evidence on that point contained in the record, which, although objected to on the ground that no prior knowledge or use of the invention claimed had been specifically set up in the answer as a defense, was nevertheless admissible for the purpose of defining the limits of the grant in the original patent, and the scope of invention described in its specification."

Of the same effect is the decision of the supreme court in the case of *Brown v. Piper*, 91 U. S. 37.

The effect of the limitations of the patent in suit by the prior state of the art is that unless the patentee is a pioneer, and has invented something new in the art, and not a mere improvement over what has been done before, or described in prior patents, he cannot invoke the doctrine of equivalents, to bring within the scope of his patent devices or processes which do not embody or make use of all the features expressly described and covered by his claims. Kennedy's patent is for a process in which sulphate of copper is used in solution. He could not have obtained a patent for the use of copper alone in extracting sulphur from oil, for many prior patents covered such a claim. He cannot now contend that his patent covers the use of copper in any form, metallic or as a salt, without the combination he specifies in his patent. In that specification he claims to use sulphate of copper (blue vitriol), with caustic soda and common salt, in about equal quantities, dissolved in water. His first claim covers the combination of sulphur in the oil with the metallic matter contained in the solution above named. He claims that his process converts the sulphate of copper into an oxide, whereas Prof. Chandler, of the Columbia College (an expert of high character and standing), has demonstrated that it is converted into hydroxide. The solution is an important part of his process, for dry oxide of copper will not purify the oil. Prof. Chandler, in his testimony, says he tried the experiment, and demonstrated that it would not. The use of dry oxide of copper, without caustic soda and salt, is, therefore, not the Kennedy process. The solution of the ingredients named, in the proportions stated, is therefore an important and essential step in the patented process, and any process which does not include it is not an infringement. Kennedy does not claim that he was the discoverer of the fact that copper has a strong affinity for sulphur. Mr. Schultz, a witness for the complainant, says:

"I also said there was an affinity between sulphur and the oxide of copper. This is common knowledge, and has been, I would not say for one hundred years, but ever since chemistry has been brought to a scientific basis,—for twenty-five years, anyhow."

Mr. Alexander, also a witness for the complainant, says:

"It is a law of nature that the oxide of copper combines with sulphur to form sulphide of copper, that being a law of nature."

Mr. English, a witness for the defendants, says:

"I used sulphate of copper twenty-eight years ago, and I used a pole in the agitator. That was in London, Canada."

Prof. Chandler, the expert for the defendants, says:

"I find from the prior state of the art, as I have described it, bearing upon the alleged invention, that the art of purifying, desulphurizing, and deodoriz-

ing hydrocarbons, liquid or gaseous, dates from the beginning of the century, and a great variety of processes have been devised and employed for this purpose. It was discovered at the very beginning that, in order to successfully remove the sulphur from hydrocarbons, liquid or gaseous, it was desirable to make use of some metal possessing a strong affinity for sulphur. These metals were applied sometimes in the metallic state, but more frequently in the form of oxides, hydrated oxides, or salts. In looking over the various processes I have described in my last answer, and numbered one to forty-five, I find that each and every one of the agents which enter into the composition of the Kennedy solution has been previously employed."

Prof. Chandler then gives various instances in which sulphate of copper was a part of the patented process, viz.: Laming & Evans, British patent, 1850; John Leslie, British patent, 1860; Baggs & Simpson, British patent, 1863; Arthur Wall, British patent, 1864; John Rowsell, United States patent, 1884,—and many others who make use of metallic salts, leaving the selection of the particular salt to persons skilled in the art. Also, it was a matter of common knowledge that oxide of copper, and the hydroxide of copper precipitated by the combination of sulphate of copper and caustic soda, but called "oxide" in the Kennedy patent, were used before that time by Edward Heard, in British patent, in 1806, the Laming & Evans British patent of 1850, and the other patents cited in Prof. Chandler's testimony.

Mr. Kennedy showed, by his testimony in reference to the use of copper, not only that he was in no sense an inventor or discoverer of the use of copper as a purifier or desulphurizer, but in his further testimony he very clearly shows that he does not know what he claims to have discovered or invented, and that in fact no inventive act was performed by him. For instance, the following occurs in his testimony:

"Q. Have any of these various works in which you made experiments you have referred to adopted the process? A. Not in whole; in part. Q. In what part? A. They are using caustic soda. Q. In what way do these persons use a part of your process,—use caustic soda? A. They use it with litharge. I consider that a part of my process. I consider the use of any ingredients mentioned in my patent, whether alone or mixed together, as being the use of my invention to that extent. Well, it is my invention, of course. It was me that invented that, and they adopted it. They adopted the litharge and caustic soda, but it does not do the work perfectly, like mine. I consider that the use of my invention, to that extent. Not the litharge, but the caustic soda, is a part of my invention. It is covered by my Canadian patent. Q. But not by the United States patent? A. The caustic soda is not necessary with the copper. It can be used. * * * The copper will work with the caustic soda, or without it. * * * Caustic soda is not necessary. You can use salt. If you use salt, it is not necessary to use caustic soda."

In his later testimony he says:

"Having sulphate of copper and caustic soda, I can't tell the real effect of adding salt. I just put these things together, and found they did the work. I don't know that there is any advantage of having both, but that is the way I discovered it. I put it in at the time I did it. I supposed it was necessary, but I do not know but what either of them would do. If I should drop any, I think I would drop the soda."

This is hardly proper testimony upon which to base the claim that the patentee invented the use of caustic soda, and that the use of

that alone, as well as the use of copper alone, is protected by his patent.

Again, it appears clear from the testimony that caustic soda was used long before Kennedy's patent. Henry Tomlinson, complainant's witness, says:

"Caustic soda has always been used in refining oils, since I was in the business,—fourteen or fifteen years. It has been used in solution; it has been mixed with litharge (oxide of lead); it has been poured into the oil."

Robert Scott, complainant's witness, says:

"Prior to Mr. Kennedy's experiments, soda has been used in the purification or desulphurization of petroleum."

Royal Burgess says:

"I am acquainted with the use of caustic soda in connection with Canadian oil for about twenty years. It is notorious and public, and everybody that knows anything about oil knows, that caustic soda is used in manufacturing, treating, and deodorizing."

Prof. Chandler says:

"Caustic soda has been frequently employed as an agent for purifying, deodorizing, and desulphurizing hydrocarbons, gaseous and liquid. So used by Edward Heard, British patent, 1806; S. W. Pugh, England, 1858;" and other patents, a long list of which is given in his testimony.

The use of common salt was a matter of common knowledge long before the invention claimed by the complainant. It has frequently been employed as an agent for purifying and desulphurizing hydrocarbon gases and oils, or as a component in a mixture for that purpose. So used by Stephen White, English patent, 1856; S. W. Pugh, English patent, 1858; William Maltby, English patent, 1859; and others. Illustrations from various patents offered in evidence by the defendants show that the uses of copper, caustic soda, and salt were common, and within the knowledge of those who had any interest in chemistry or patented processes, long prior to the time of the complainant's patent. In 1855 Benjamin Fulwood used oxide of copper in purifying oily, bituminous, and other matters. In 1855 Richard A. Tilghman stirred into the oil oxide of copper or oxide of lead sufficient to combine with the sulphur; and states that, after stirring, the sulphuret of lead or copper is allowed to settle at the bottom, the fatty body is then drawn off, to be distilled in the usual manner; and states that the metallic lead or copper, or peroxide of manganese, may be used; and speaks of the strong affinity which copper has for sulphur or phosphorus. Caustic soda and common salt were also used, as Prof. Chandler claims. In 1856 Stephen White used common salt and neutral chromate of potash. In 1858 Pugh used caustic soda, caustic potash, and chloride of sodium (common salt). In 1867 Orazio Luga, for deodorizing petroleum, used chloride of sodium (common salt), and caustic soda.

A few of the patents cited in evidence only are here referred to, as showing the state of the art at the time of the complainant's alleged invention. From these references it is clear that the state of the art at the time of the alleged invention shows that the affinity of all metallic salts and oxides for sulphur was well known; that

the use of copper in purifying, desulphurizing, and deodorizing oils and gases was a matter of common knowledge, and has been since 1806; that the combination of sulphate of copper with caustic soda, with the resulting reaction and precipitate, was well known; that the oxide of copper, however produced, was used and well known as a proper form in which to exhibit the copper to the oil or gas for the purpose of combining with the sulphur; that both chloride of sodium and caustic soda were well-known agents for the same purpose. In view of these facts, we cannot concede the complainant's contention to claim either that he has in any manner invented or discovered the affinity of copper, in any form, for sulphur, or that he has in any manner discovered the affinity of oxide of copper for the sulphur in hydrocarbon oils or gases, or that he was in any manner the pioneer in the use of copper salts or copper oxides in the desulphurization of sulphur-bearing oils or gases, or that he was in any manner the inventor or pioneer in the use of caustic soda for any of these purposes. Availing himself of this common knowledge, he describes a process which involves four distinct steps: He first prepares the chemicals, by mixing them in equal proportions in water, and putting this solution in with the oil. He next heats the whole until near the boiling point, and then allows it to cool. He then permits the chemicals to settle, and separates them. He next removes the traces of soda, copper, and salt left in the oil, either by distillation, or by the ordinary Pennsylvania process. Having proceeded in this way, he claims that the oil will be left free from sulphur at the end of the third step in the process, and free also from traces of metallic matter at the end of the fourth step. But it is contended by the defendants that, if this process is followed as the plaintiff has described, the result will not follow as claimed in the patent. In other words, the defendants contend that the utter want of utility is such that no patentable novelty exists. In support of this contention, it is urged that the patent granted in 1887 has never been in practical use, although it was offered to a great many refiners, both in Canada and America. While it is true that the extensive use and sale by the public of a new device is evidence of its utility, and suggestive of its novelty, the reverse of the rule is also true; but this may be explained by the inability of the patentee to introduce it, for want of means, or because of powerful competition and rivalry, or for other reasons. But it does appear from the evidence that this invention was offered to a large number of refiners, but none of them has ever adopted it, or made a barrel of oil from it. The proof shows that it was offered to the Crystal Refining Company, at Toledo; the Eagle Consolidated Refining Company, of Lima; the Cleveland Refining Company, and Scofield, Shurmer & Teagle, of Cleveland,—all of which are rival institutions to these defendants. It is not to be presumed, therefore, that they declined the use of the process from any desire to favor the defendants. The failure to adopt this process is clearly shown to have been because of its want of utility. Various experiments were made in the several refineries, and the process was rejected because the results of such experiments were unsatisfactory. Complainant undertakes to explain the failure

of these different experiments, and does so in part; but other witnesses, disinterested, say that the experiments were unsatisfactory, though Mr. Kennedy was given a fair opportunity to put them in operation. Mr. Royal B. Burgess, who was the superintendent of the Imperial Works at Petrolia, in Canada, when the complainant made the experiments there, says that the whole work was done under the complainant's superintendence and direction; that the result was not as good as the old Canadian process of putting oxide of lead and caustic soda into the oil after treating it. He says the oil treated by Kennedy was neither desulphurized nor deodorized, would not "stand the doctor," was off color, clouded the chimney, smoked, crusted the wick, and gave offensive odors. In this he was corroborated by the testimony of William English, of the same works. In the experiments at the Crystal Works, in Toledo, Mr. Kennedy himself gave evidence that the process would not do what he claimed for it. In his letter to Neilson, dated Petrolia, September 13, 1891, he says:

"I think I told you it was necessary to have steam in the still to keep down the temperature during distillation. If you had steam in, once it gets sweet, it will not develop sulphur any more, and what remains in the still will be perfectly sweet, as, with steam in it, the temperature will not get up high enough to develop any sulphur to the end of the run. I think you had very good success in getting a little over sweet, the way you tried it. There is no use to try it without steam."

This was written only 6 months before the institution of this suit, and 3½ years after the date of his patent, and after he had experimented in a great many refineries in both Canada and the United States; and the result of these experiments was, to use his own language, "there is no use to try it without steam." This was very important testimony, and is a step in the process not hinted at in the specifications in his patent, or in either of his claims. His failure to make this a part of his process in his claims is fatal to it. In the case of *O'Reilly v. Morse*, 15 How. 62, Chief Justice Taney says:

"Whoever discovers that a certain useful result will be produced in any art, machine, manufacture, or composition of matter by the use of certain means is entitled to a patent for it, provided he specifies the means he uses in a manner so full and exact that any one skilled in the science to which it appertains can, by using the means he specifies, without any addition or subtraction therefrom, produce precisely the result he describes. And if this cannot be done by the means he describes the patent is void."

It is not necessary here to review in detail the testimony concerning the experiments made by Kennedy at the works of the Eagle Consolidated Refining Company, the Cleveland Refining Company, Scofield, Shurmer & Teagle, John McWilliams Refinery, and the Petrolia Crude Oil & Tanking Company. But evidence of its inutility is not only to be found from the testimony of these unsuccessful experiments made in so many different places, covering a long period of time, but we have the testimony of Prof. Chandler, the defendants' expert, who made three sets of experiments for the purpose of determining whether the result claimed would follow the process described in the patent. He purchased his own materials, labeled them, made a record of the experiments, and in his evidence produced

the result; offering the materials used in his experiments in evidence, and proposing to repeat the experiment in the presence of complainant and his counsel, if they desired. As the result of the first experiment, he found the product was not free from sulphur, not pure, had an offensive odor, would not "stand the doctor," clouded the chimney, incrustated the wick, and produced an offensive odor in burning; in fact, did not accomplish any of the things claimed for it in the patent. The result of the second experiment was that both the products resulting therefrom were offensive, not free from sulphur, not pure, would not "stand the doctor"; when burned, clouded the chimney, incrustated the wick, and emitted offensive odors. In the third experiment, Prof. Chandler, to get a comparative result, took a part of the same distillate produced by him from Lima crude, and gave it the ordinary Pennsylvania treatment of sulphuric acid and caustic soda, and with the same result, exactly, as when he used the complainant's process; one being no better and no worse than the other, neither having removed the sulphur. In connection with his testimony, he offered an exhibit of the lamps, wicks, and globes used, to show that the oil, as the result of this process, was not free from sulphur. This testimony of Prof. Chandler's was taken in June, 1893. No effort has been made to contradict it by the experiments made by any competent experts. It is true that the complainant did make some experiments by two experts who came to the office of complainant's solicitor, as the result of an advertisement in a New York paper. They were employed by him to make the experiments to demonstrate that the process described in the patent would produce the result claimed. These men were young and of little experience. They testify themselves that the materials with which they made the experiments were furnished them by the complainant's solicitor; that they did not know where they were procured, or whether they were pure and genuine; and that the tests were made under the direction of complainant's solicitor. The results are testified to by them, but the material with which they made their experiments was not offered in evidence, and no means afforded of verifying the correctness of their conclusions. This testimony is not satisfactory to the court. There are many suspicious circumstances surrounding these and other experiments made by these and other witnesses. No means of verifying them are left open, and no offer is made to repeat them in the presence of defendants' counsel or their expert. So many processes are known by which oils can be purified and deodorized. These experts were produced, and sweetened oil was offered in evidence as the result of their experiment. Now, an experiment, to be satisfactory to the court, ought either to be performed in its presence, or else the evidence ought to be entirely satisfactory that the materials used were genuine and pure, and that the process followed was as stated. So far as the experiments made by Prof. Chandler are concerned, they are satisfactory. The materials offered were produced in evidence, and, as before stated, the professor offered to repeat the experiments in the presence of the complainant's solicitor, or his experts, or in any other way that might be deemed satisfactory to complainant

or his counsel. But as to the experiments made on behalf of the complainant, as before stated, the proof is not so satisfactory, and, taken together with all the testimony in the case, establishes to the satisfaction of the court that the process described in the complainant's patent will not produce the result claimed. To sustain this conclusion of the court as to the unsatisfactory character of these experiments, the testimony shows that, by the Canadian process, oil that will "stand the doctor" may be produced. Archibald McDonald and William Holgate, two witnesses in the case, both swear positively that the caustic soda used in the chemical mixture put into the oil was the doctor, viz. plumbate of soda, which is composed of caustic soda and litharge (or oxide of lead) mixed together. So that by using the old and well-known Canadian mixture of litharge and caustic soda, by which all their oil is made to "stand the doctor," together with copper compound in inordinate quantities, complainant got a little oil by distillation that stood the test of litharge and soda, when applied to it. The testimony of these witnesses is uncontradicted. No one denies the use of the plumbate of soda, instead of caustic soda, in these experiments. Complainant refuses to give any explanation of their story. But Prof. Chandler testifies that he made the same experiments, following just what the witnesses say Kennedy used, and he got no oil that would "stand the doctor." He also made experiments, and substituted plumbate of soda for caustic soda, and some fractions of oil, caught in samples, did "stand the doctor." After the testimony of the witnesses was taken as to the experiments at Petrolia, Prof. Chandler read that testimony, and then made experiments to determine whether the results testified to by them could have been reached by the process claimed in the patent. He was convinced that the results they did reach were brought about by the substitution of plumbate of soda for caustic soda in making up the Canadian mixture by which the oil was tried. His experiments completely confirmed him in this conclusion. He says:

"There is no other explanation to reconcile the results alleged to have been obtained with those which have followed my own investigations and experiments on the subject. It was the testimony of these witnesses that led me to make the experiment with plumbate of soda (the doctor), as some of them stated the plumbate of soda was the material used, in the still with the oil."

After carefully examining the testimony with reference to the complainant's experiments, and those of Prof. Chandler on behalf of the defendants, I have come to the conclusion that the patentee did not describe in his specifications, or state in his claims, a process which would produce the result contended for by him. I therefore find that there is not sufficient proof of novelty to sustain the patent, and that the same is invalid.

The proof of infringement is also deficient. The burden of making out the charge of infringement rests, of course, upon the complainant. This is well settled by repeated adjudications of the courts, and does not require the citation of authority. Complainant's witnesses substantially admit that the defendants do not use either caustic soda or common salt in their process. They do use a

copper scale, some sort of metallic copper, but not a sulphate of copper. The complainant claims that his process produces oxide of copper. Prof. Chandler testifies distinctly that it produces hydroxide of copper. Complainant cannot now claim that these are equivalents, because there is no proof in the record to show it. That they are not to be regarded as the same thing, in a patented process, we refer to the case of *Hills v. Gaslight Co.*, 9 Jur. (N. S.) 140. In that case the plaintiff claimed as his invention "the purifying of gas from sulphuretted hydrogen, etc., by passing it through the precipitated or hydrated oxides of iron, from whatever source obtained." The defendants in that case used for the purification of their gas a natural product or substance found in Ireland, called "bog ocre." It was held that the use of bog ocre, so long as the same was used in its native state or condition, was not an infringement of complainant's patent. The patent calls for the ingredients in fixed proportions, viz. 1 pound each of sulphate of copper, caustic soda, and common salt, dissolved in 2 gallons of water, for every 40 gallons of oil to be treated. It is to be noted that in Kennedy's experiments no regard was paid to the proportion of these ingredients. Now, in a process patent, the proportions, if fixed, must be substantially used in the infringing process, to make the user liable. *Tyler v. Boston*, 7 Wall. 327. As before stated, the proof of infringement in this case is very unsatisfactory. A hard, metallic substance was produced by the complainant's witnesses as the dry oxide of copper used by the defendants. It is a solid compound of iron oxide and copper oxide, and, to mix it with the oil to be treated, it must first be ground to powder, and only a small part of the copper can be utilized. Kennedy himself says in his testimony that not more than one-fifth of it can be so used. Kennedy dissolves his chemicals in water, in order to cause them to mix with the oil. The substance which it is alleged the defendants use cannot be dissolved. There is no claim that the proof shows the use of any soda or salt by the defendants. The solution in water is an essential step in the Kennedy process, and obviously cannot be used by the defendants. The next step of Kennedy's treatment is thus described in his patent:

"This solution [of blue vitriol, caustic soda, and salt in water], with its precipitate, is then put in the still with the oil, and when the oil boils the precipitate (oxide of copper) dissolves, and combines with the sulphur of the oil, forming sulphide of copper, which, with the greater portion of the solution remaining in the oil, settles to the bottom when the oil is cool, and can be drawn off."

It cannot be claimed that this boiling of the oil is distillation, for it precedes distillation, which occurs after the oil has become cool and the precipitate settled. If distillation was meant, the oil would have passed out of the still in vapor, so that there would be no oil left in the still for the greater portion of the solution to remain in and settle to the bottom. Again, the boiling point of water is so much lower than the boiling point of the oil that the water would all be evaporated before the oil was distilled. Therefore it would be impossible to draw off the solution from the oil. It is evident, therefore, that the oil is to be heated, and the solution and combined

chemicals drawn off, before the distillation of the oil takes place. The last step is the removal from the oil of a trace of the soda, copper, and salt, which is effected by washing with water, sulphuric acid, and soda. This trace, it will be noted, must be held in combination mechanically, which shows that the ingredients had not united with the sulphur of the oil, or they would have been precipitated. As before stated, there is absolutely no proof that the defendants used any one of these several steps of treatment. There can, therefore, be no infringement by the defendants of the patent in suit, as they do not use the ingredients in the same proportion, and the oil is not treated in the same way. It will be observed, from the reading of the bill, that the defendants are not called upon by interrogatories for any disclosure of the process used by them in curing their oils. The complainant has therefore chosen to rely entirely upon his own witnesses to show infringement. Many of these witnesses were men formerly in the employ of the defendants. They described the process used to the best of their knowledge, and they are, no doubt, truthful in their statements; but they are not intelligent,—are not able to give any connected and satisfactory account of the process used. For instance, all these witnesses concur in the statement that some hard, metallic substance was used, after being burned and ground. One witness (Henry Miller) produces a piece of this compound, which he says he got from the floor of the mill of the defendants, where they were dumping the sacks in which the material came. Another witness (Huntz), also called by the complainant, when shown this compound, declares that it is nothing like that used by the defendants; that he never saw anything like it about their works; that it was not like it in any way, and not like it in weight. This kind of testimony may be sufficient to create a suspicion that the defendants are using, to some extent, some of the ingredients embraced in the complainant's patent and process, but it is not of a character to justify a court in finding infringement. A mere guess at a process used, or a description of a process, by an ignorant witness, without clearly showing the chemical combinations that are used, is not sufficient to overthrow the testimony of such a learned expert as Prof. Chandler, who, after reading the testimony of these witnesses, undertook to carry out the process they described, and testifies that it did not result, in any instance, in curing the oil so as to make it a marketable product. Thus, Mr. Kennedy himself, in commenting upon the testimony as to the defendants' process, says:

"That to dissolve the copper is the only good process that he knows of; the grinding it up is a cumbersome waste of material because in that state they cannot get the benefit of all the copper at all,—I don't believe, one-fifth of the copper. You can't get it fine enough. There is a heavy waste in burning this oxide of copper every time, which can only be repaired by adding new material—fresh copper—to it."

Kennedy's process, to repeat again, is to take equal parts of sulphate of copper, caustic soda, and common salt, dissolve in water, and put the solution into the still with the oil, heat the whole to the boiling point, let it cool, and draw off the chemicals, and at that

stage of the process the work of desulphurizing and sweetening the oil is complete; all that remains being to remove any trace of copper, soda, and salt remaining in the oil, by distillation, or the ordinary sulphuric acid treatment. Now, the process testified to by the complainant's witnesses as that which is used by the defendants is to take their ingredients, whatever they may be, burn them to a red heat in a furnace, then take them to a crusher, and crush them, then to another furnace, and burn them again, and then to a mill, and grind them, then to a bolter and sifter, and sift them to a fine powder, like flour; and this powder is applied by putting it into the oil, and pumping it into cylinders attached to the stills, through which the vapor must pass during distillation, and contact thus obtained with the vapor, in one case, and in the other case, after the oil is distilled, applying the compound to the distillate in a sweetening still, with a drag in motion to keep it stirred up, and distilling again in the presence of the compound. There is no similarity in these treatments, and the latter cannot, in any manner, be claimed to be an infringement of the former. But the complainant's experts insist that the two processes are chemically the same, Mr. Alexander claiming that "the essence of the patent, in both cases, consists in the law of nature that the oxide of copper combines with sulphur to form sulphide of copper," and Mr. Schultz claiming that, "chemically speaking, there is no difference between the two processes. Both use oxide of copper, and have used it to produce the same result. They manufacture oxide of copper, then they mix this with sour oil, apply heat so that the sulphur in the oil will combine with the oxide of copper. After that, they separate the oil from the residue." The claim on behalf of the complainant is, then, that the two processes produce the same result; that the burning of the copper scales by the defendants in the open air forms oxide of copper. Kennedy produces the same result by dissolving the sulphate of copper, caustic soda, and salt. But both Alexander and Schultz ignore the claim of the Kennedy patent that the desulphurizing agents form a mixture, by aqueous solution of these three ingredients, which, when applied to the oil, and the whole heated, will complete the desulphurization. They ignore the method of application, the quantities of the ingredients used, and the important fact that the testimony shows that the defendants do not use the ingredients named in the patent in any combination whatever, and do not apply them in the same way, or in any other way. Considering all this testimony, Prof. Chandler says:

"I understand the witnesses for complainant to testify that distillation is always an essential feature of the process of purification employed by the defendants. It is a fact that the oil undergoing purification, as testified to by complainant's witnesses, is, in the vapor form, in the presence of defendants' compound; the compound being in the still, or in the cylinders connected with the still. In the patent in suit there is no suggestion of treating the oil while it is in vapor form, or of the oil being, in vapor form, in contact with the purifying solution. On the contrary, it is clear that the oil is to be in liquid form while it is in contact with the purifying solution, and the solution is to be drawn off before the oil is subjected to any further treatment. In one case, the further treatment is simply treatment with acid; in the other case, it is distilling. The inference I draw from the description in Kennedy's patent is that the alleged purifying material is to be drawn off (line 30) and

the oil then distilled (line 31); that it is not the intention of the inventor to distill the oil until after the solution containing the chemicals shall have been withdrawn. This is consistent with the theory of the process in the patent, for he says that the purification takes place when the oil is brought to a boiling temperature; that the sulphur combines with the copper, and settles to the bottom with the greater part of the solution. There is no object, therefore, in leaving the solution in contact with the oil during the process of distillation, but serious objections to it, especially the danger and difficulty of distilling oil in contact with water and a sediment of the character of the precipitate contained in the Kennedy solution. First, the danger of boiling over, on account of the difficulty of regulating the distillation in such mixture; second, the danger of precipitate caking on the bottom, burning out the still. It is evident, therefore, that the intention of the Kennedy patent is not that the oil should be distilled in contact with the solution, but that the purifying solution should be withdrawn from the still before distillation is undertaken. This is also shown by the statement beginning on line 35,—that, instead of distilling the oil to remove the traces of soda, copper, and salt, they may be washed out with water, sulphuric acid, and soda.”

In view of this important testimony, the language of Judge Dyer in *Rowell v. Lindsay*, 6 Fed. 290, has direct application:

“It is a settled rule of law that, where a patent is for a combination of known parts, it is not infringed by the use of any number of the parts less than the whole; for the patent, in every such case, is for that identical combination, and nothing else, and a combination of any less number of parts is a different thing. The combination is an entirety. Unless it is maintained as such, the whole invention fails. If one of the elements is given up, the thing claimed disappears. The different parts may perform more or less important functions, but each and all are essential to make the thing which the patentee has claimed as his invention.”

It appears clear from this testimony that the proof as to infringement is wholly wanting. There is nothing to show that the defendants use an aqueous solution, of equal parts or unequal parts, of copper, soda, or salt, and nothing to show that they apply the ingredients in such solution to the oil; nothing to show that they heat the oil and the solution to the boiling point, and then allow the whole to cool, and the chemicals to settle, and draw them off; nothing to show that they distill and remove the trace of metallic matter held in the vessel mechanically. But it does appear from the testimony of the complainant's witnesses that the defendants do not use either the soda or salt in their process for desulphurizing petroleum. It is shown affirmatively from complainant's witnesses that the defendants keep the oil in their stills continually agitated, and that if this agitation ceases the oil begins to smell badly. This is sufficient to show that the defendants' process is entirely different from that of the complainant. For these reasons, the court reaches the conclusion that there is no proof of infringement, and that the bill must therefore be dismissed.

I have given this case very careful consideration. I recognize the fact that the complainant has labored under some difficulties in prosecuting his suit. I have repeatedly extended the time for him to deposit money to secure the costs in the case, and given him every indulgence and every opportunity to present all his testimony, and to procure it in the most expeditious and economical manner. But I am impressed with the fact that he has wholly failed to make out his

case, and that the conclusion reached by the court is abundantly justified by the evidence in the case. A decree may therefore be prepared, dismissing the bill, as before stated.

OHIO RAKE CO. v. DAYTON FARM IMPLEMENT CO.

(Circuit Court, S. D. Ohio, W. D. July 22, 1895.)

No. 4,587.

1. PATENTS—NOVELTY AND UTILITY—DISK HARROWS.

An arrangement of the two gangs of disks in a disk harrow, having outwardly curved disks, whereby one gang is placed in advance of the other, and the innermost disk of the rear gang travels between the tracks of the two inside disks of the other gang, so as to leave no ridge between the gangs, and cultivate the ground evenly, which result had never before been attained, *held* a novel and useful invention.

2. SAME—INFRINGEMENT.

A claim for a disk harrow, having the ends of the two gangs of disks overlapping, with the innermost disk of one gang "working between the innermost two of the other, substantially as herein described," is not restricted so as to require that such disk should revolve bodily between the other two, but is infringed by a harrow in which the innermost disk of the rear gang follows between the tracks of the inner two disks of the other, though not so near as to have any part of it between them.

3. SAME—HARROWS.

The Dorsey patent, No. 344,950, for an improvement in disk seeders and cultivators, *held* not anticipated, valid, and infringed.

4. SAME.

The Little patent, No. 418,199, for an improvement in disk harrows, and relating especially to the construction of a hinge for coupling the gangs of disks to the main frame, is void, as involving merely mechanical skill.

This was a bill by the Ohio Rake Company against the Dayton Farm Implement Company for alleged infringement of two patents relating to disk harrows.

Joseph G. Parkinson, for complainant.

Stem & Allen, for defendant.

SAGE, District Judge. This is a suit on two patents, owned by complainant,—No. 344,950, issued July 6, 1886, to Basil C. Dorsey, for an improvement in disk seeders and cultivators; and No. 418,199, issued December 31, 1889, to P. E. Little, for an improvement in harrows. The Dorsey patent relates to a construction of disk harrows wherein two gangs of disks are pivoted to the main beam, one in advance of the other, and one gang arranged to overlap the other. The Little patent relates to a particular construction of hinge for coupling the gangs of disks to the main frame of the harrow. The only claim alleged to be infringed in the Dorsey patent is the first, which reads as follows:

"The disk gangs, G, the disks or cutters of which are cupped or concaved outwardly to throw the dirt from the center, said gangs having their inner or adjacent ends overlapping, with the innermost cutter or disk of one working between the innermost two of the other, substantially as herein described."