Case No. 719.

BADISCHE ANILIN & SODA FABREK v. COCHRANE et al.

{16 Blatchf. 155; 4 Ban. & A. 215; Merw. Pat. Inv. 172.}[1]

Circuit Court, S. D. New York. April 15, 1879.[2]

PATENTS FOR INVENTIONS—APPLICATION—SPECIMENS OF COMPOUND ARTIFICIAL ALIZARINE.

1. Reissued letters patent No. 4,321, division B, granted April 4th, 1871, to Charles Graebe and Charles Liebermann, for artificial alizarine produced from anthracine, are valid.
2. The decision of this court in Anilin v. Higgin, {Badische Anilin & Soda Fabrik v. Higgin. ase No. 722,} confirmed.
3. Artificial alizarine, made according to the process of the patent, was a new product, and was patentable.
4. The application for the patent was not accompanied by any specimen of ingredients or of the compound; but it was for the patent office to determine whether the nature of the case admitted of specimens, and the want of them is not made a statutory defence to a patent.
5. The artificial alizarine of the patent is different from chemically pure alizarine, and the patent covers the invention.
6. The patent is infringed by an article produced by the process of letters patent No. 153,536,

granted July 28th, 1874, to Heinrich Caro, Charles Graebe and Charles Liebermann. {See note at end of case.}

{In equity. Bill by Badische Anilin & Soda Fabrik against Alexander Cochrane and others for infringement of letters patent Decree for complainant Reversed by supreme court in Cochrane v. Badische Anilin & Soda Fabrik, 111 U. S. 293, 4 Sup. Ct 455.}

George Gifford and John Van Santvoord, for plaintiff.

Dlckerson & Beaman, for defendants.

WHEELER, District Judge. This bill is brought upon division B of reissued letters patent No. 4,321, dated April 4th, 1871, to Charles Graebe and Charles Liebermann, for artificial alizarine produced from anthracine, now owned by the plaintiff. The cause was heard upon the pleadings and the plaintiff's evidence, at October term, 1877. While it was under consideration, a motion to open it for taking further evidence was filed by the defendants, and evidence was taken upon that motion. Pending the motion the parties, with the consent of the court, stipulated all that evidence and some other into the case, to be used as if taken in chief, and it has again been fully heard upon the pleadings and all this evidence and arguments of counsel.

The original patent was for the process of making this alizarine: It was surrendered and reissued in two divisions, one for the process, and the other, this one, for the product. This division of the patent, and the question of infringement by the same means as those by which the defendants are now claimed to infringe, were under consideration in a cause in favor of this plaintiff {Badische Anilin & Soda Fabrik} against Hamilton Manufacturing Company {Case No. 721) in the Massachusetts district, February 4th, 1878, and in another cause, {Badische Anilin & Soda Fabrik,} against Higgin, in this district, September, 1878, {Case No. 722.} Several questions were made there about the regularity of the reissue, which have not been insisted upon here. The questions now raised in argument are, whether this product is, in fact, so new a product as to be patentable under the law in any form? and, if it is, whether this division of the patent, as granted, covers it? and, if both, whether the defendants infringe it? These questions were considered and determined in those cases, as there presented. But there is considerable evidence in this case not in either of those; and, therefore, it has been fully heard, examined and considered, by itself, without resting its decision upon the authority of those.

Alizarine is a natural dye-stuff, found in the root of the madder plant, and has long been known as such, in the art of coloring. It is formed and held in the fibre of the root, and reached by disintegrating the substances which it is among, separating it from them, and securing it by long and well known processes. It is essentially an extract from among other natural products, and not in any sense an artificial compound. Its structure was carefully studied by chemists, and its molecular formation ascertained to be composed of fourteen atoms of carbon, eight of hydrogen, and four of oxygen, represented by the

formula $C_{14}H_3O_4$ of chemists. The defendants insist that the production of Graebe and Liebermann is the same thing.

Anthracene was a waste product of coaltar—a hydrocarbon—its molecules consisting of fourteen atoms of carbon and ten of hydrogen, in formula $C_{14}H_{10}$. A chinone had been formed from it, by replacing two atoms of hydrogen with two of oxygen, called anthrachinone. with the formula $C_{14}H_8O_1$having two atoms less of oxygen than chemically pure alizarine. Anthracene was not in any sense a dye-stuff, neither was anthrachinone; and neither did either contain anything that was a dye-stuff, or any coloring matter which could be extracted in any manner, for none was there. But their molecular structure was so like that of alizarine, that Graebe and Liebermann were led to investigate whether there was anything there from which any substance, embodying the coloring principle of alizarine, could be produced. To produce what would have the same chemical formula, it was necessary to add two atoms of oxygen, or to replace two atoms of hydrogen with two of hydroxyl. That accomplished would not insure the production of the same thing, although having the same formula, nor anything with like properties. The molecules to be acted upon were very complex, and their atoms very liable to be disarranged by any process of addition or substitution. Graebe and Liebermann devised a method, involving various steps, for effecting the changes desired, tried it, and succeeded in obtaining a substance whose formula would be the same, and whose properties the same or like those of alizarine, and which they termed alizarine. When they had done this they had not discovered natural alizarine anywhere, and extracted it, but they had made an alizarine synthetically, from substances never before containing it, nor anything like it. What they made was a worthy substitute for, whether more or less nearly or exactly like, the natural alizarine of madder.

If this substance should be found to be so like natural alizarine that no one could tell the difference between them, or know them apart except by their source, the question would be presented, whether, even then, it would not, of itself, be subject under the law to a patent granting to its inventors an exclusive right to it, and whether this patent is not valid for that purpose. The statute entitled an inventor of any new and useful art, machine, manufacture or composition of matter to a patent for it on application, accompanied

by a drawing, with references, "where the nature of the case admits of drawings, or with specimens of ingredients, and of the composition of matter, sufficient in quantity for the purpose of experiment, where the invention or discovery Is of a composition of matter." Act July 4, 1836, § 6; 5 Stat. 119. The application for this patent was not accompanied by any specimen of ingredients or of the compound. It is urged, in argument, that this product is not a patentable composition of matter, and that the absence of specimens shows it is not, and that it is not a manufacture, nor anything mentioned in the patent law as patentable. These terms in the statute are not understood to be placed there as stools, betwixt which inventors may fall to the ground, but to cover the whole range of useful invention, to every piece of which some one of them, and to many, more than one of them, will apply. This product may fall under the head of either a manufacture, or a composition of matter. If it is a composition of matter only, the statute, from the context as quoted, may be construed to mean that specimens are to accompany the application, when the nature of the case admits of specimens. If the statute is so construed, whether the nature of a case so admits, must be left to the determination of the patent office, subject to its requirement. And in this case it must have been determined that the nature of the case did not so admit, and so none have been required. And, however this may be, the statute has not placed the lack of specimens among the defences to a patent, and, as it was granted, it cannot fail for that reason.

The English statute, (21 Jac. 1, c. 3,) only saved grants and privileges of the sole working or making of any manner of new manufacture within the realm, to the first and true inventors of such manufactures, from the prohibition of monopolies; but, inder the liberal construction which the word manufacture in the statute, from the nature of the subject, required, and, at the hands of the courts, received, to carry out the intention, it was extended so as to cover all subjects of invention of material things that were useful. Boulton v. Bull, 2 H. Bl. 463; Hornblower v. Boulton, 8 Term R. 95.

This production of Graebe and Liebermann, however like natural alizarine, was not that. It was entirely new in its source and its coming. No one had ever seen or known of such a thing before. Its addition to the productions known before was, in the language of Buller, J., in Rex v. Arkwright, Webst. Pat. Cas. 71, a vast "improvement of the trade." According to Heath, J., in Boulton v. Bull, [supra,] the product only, and not the process alone, would have been patentable, under the English statute. He said, referring to the statute: "What then falls within the scope of the proviso? Such manufactures as are reducible to two classes. The first includes machinery, the second substances, (such as medicines,) formed by chemical and other processes, where the vendible substance is the thing produced, and that which operates preserves no permanent form." "I asked, in the argument, for an instance of a patent for a method, and none such could be produced. I was then pressed with patents for chemical processes, many of which are for a

method, but that is from an inaccuracy of expression, because the patent in truth is for a vendible substance." This, of course, does not show that, under a statute which includes the term art, a process merely would not be patentable; but, a product patentable under one would be under the other. In Stelner v. Heald, 6 Eng. Law & Eq. 536, the patent was for the invention of a new manufacture of garancine. Garancine was an extract from madder, having its pure red coloring matter, and was well known. The plaintiff produced it from spent madder, by the same process by which it had before been produced from fresh madder. It was ruled at the trial, that, because it was the same substance, it was not a new manufacture. This ruling was reversed in the exchequer chamber, on the ground that spent madder "might be a very different thing from fresh madder, in its properties, chemical and otherwise," and that whether it was or not would be material to the validity of the patent. If it was, the novelty of the manufacture would consist wholly in the material from which it was produced. There would be a combination of new materials, which would be a new combination; and so there would be here. In the case of The Wood Paper Patent, 23 Wall. [90 U. S.] 566, the paper pulp sought to be covered by the patent was not made at all by the new process, but was merely extracted by it. It was cellulose before the treatment and after; an extract and not a compound; and its patentability appears to have been denied on that ground. There was no new combination about it.

The plaintiff does not, however, rest the claim of novelty upon the production from a new source, but claims, upon the evidence, that the thing itself, independent of its source, when compared with the alizarine of madder, is different from it The defendants deny this, and the evidence, although all credible, in view of the honesty and sincerity of the witnesses, is somewhat conflicting. The question is one of fact, and quite intricate, involving a high degree of skill in the subject, and requiring the aid of persons possessed of it, which has been furnished by both sides.

Considerable of the testimony, and especially of that from abroad, taken probably without the presence of counsel who manage the cause, goes to show only what Graebe and Liebermann sought after, and thought they had found, when they had succeeded with their experiments, rather than to show what they actually did discover and invent. But, what they sought for, intended, or

thought, does not seem to be of so much importance here. An invention is not like a will, depending on intention. It is a fact, and, if the fact exists, it does not appear to be material whether it came by design, or accidentally without being bidden. The question here is, whether this substance which they produced is, in its structure and properties, old or new; and not whether they looked for something old or new, or thought they had found either one or the other. Separated from the rest, the testimony as to whether this product is actually different from the other, in some respects material to dye-stuffs, is full, and not very conflicting. Each has the formula $C_{14}H_8O_4$, but that is not conclusive. Alone it is hardly a circumstance. Chemists on each side of the case agree about this. Prof. Chandler, at page 204, so expresses himself, and instances diamonds and plumbago as having the same formula without any resemblance. The testimony of President Morton at page 466, and that of Prof. Hedrick at page 52, is to the same effect. As an example akin to this question, shown by the evidence, there is the purpurine of madder, whose formula is $C_{14}H_8O_5$. Perkin discovered a purpurine from anthracene, which he called anthrapurpurine; Auerbach, a purpurine from the same source, which he called isopurpurine. Some say these two are the same and others that they are different, but all agree that both are different from the purpurine of madder, yet each has the same formula $C_{14}H_8O_5$.

The presence of these newly discovered purpurines in the artificial alizarine, where they are said to have and appear to have an important influence, is relied upon largely as showing that it is different from the natural alizarine. The testimony of several eminent and reliable chemists is to the effect that it is so present. The testimony of Prof. Chandler, who is also eminent and reliable, is largely depended upon to show to the contrary; yet after spending a great deal of time in investigating the subject, and after having testified in regard to it several times before, and as late as November, 1878, he testified further, speaking of the process of the patent: "I am today unable to say whether anthrapurpurine or isopurpurine is a necessary by-product of the bromine process of Graebe and Liebermann." He appears to depend largely upon what they intended and thought, in settling in his own mind what they did. The little importance of their intentions and suppositions becomes more apparent, when it is considered, in this connection, that isopurpurine and anthrapurpurine, whether the same or different, were not discovered at all until 1870, long after the invention and patent. On this question it seems sufficient to say, without specifically referring to the evidence further, that it is satisfactorily found, as a matter of fact, that this artificial alizarine of the patent is essentially different, In capabilities and properties, from chemically pure alizarine, madder alizarine, or any coloring matter before known and used.

It has been argued with much plausibility, for the defendants, that the patent itself is, in intention and effect, a patent for chemically pure alizarine; that the various steps of the process described in it might as well be represented by chemical notation, in equations

and formulae which would end in the formula $C_{14}H_8O_4$; and that, if the finding should be as just stated, the invention would be of one thing, and the patent for another, and that patented old and well known. Here, in view of the evidence relied upon in support of these propositions, the distinction between what the inventors actually did, and what they intended to do and supposed they had done, as well as the difference between this patent and others and other documents, must be attended to. In the specification of an English patent, and elsewhere in writings, they characterized this product as chemically pure alizarine. There is considerable controversy among experts about the meaning of that expression where used. But neither that expression, nor the formula for it, is used in this patent, and this patent must speak for itself, and be understood as expressing what is to be gathered from what is there. Considering anthracene, or anthrachinone, as the starting point, the patent describes a series of chemical reactions ending with the "yellow flocks of alizarine." These reactions might be stated in equations, but it is to be remembered that, as shown before, the successive formulae, when stated, would not show all the characteristics or properties of the corresponding substances. So, the fact that they could be expressed in equations, and that chemists would understand the same things when so expressed that they do as now expressed, is not at all decisive. Neither could the actual effect of such reactions be accurately calculated beforehand. They must be first tried and their effect found from the actual result

The question here is what in fact this result, the alizarine in yellow flocks, is. There can be no fair doubt, upon the evidence, but that the process can be carried out to a practical result. Several persons testify that they have done it, and no one testifies that these persons have not done it, nor really that it cannot be done. Those who have done it to any considerable extent agree, also, in testifying, that a practical dye-stuff is produced, which, although represented in formula like chemically pure alizarine, and probably containing it, is different from it. Upon this testimony, considered with all the other testimony and evidence, it is found that the product of the patent is different from chemically pure alizarine, and that the patent covers the invention.

It remains to be considered whether the defendants infringe. That they deal in an article produced by the process of subsequent

letters patent, No. 153,536, dated July 28th, 1874, to Helnrich Caro, Graebe and Liebermann, is proved and not disputed. If that substance is the same, they do infringe.

In the patent in controversy, anthracene was to be converted into anthrachinone by a known process mentioned; and anthrachinone into alizarine, according to Prof. Chandler," by adding, by means of bromine, two atoms of oxygen; or, according to President Morton, by substituting two atoms of hydroxyl for two atoms of hydrogen, by introducing in place of the hydrogen, bromine, which could be replaced by the hydroxyl; or, according to Prof. Ordway, by replacing the hydrogen with hydroxyl by the use of bromine as a radical. These are understood to be merely different descriptions of the same chemical process, in which the bromine, as said by Prof. Hedrick, does not inhere at all in the result. It served only as a sort of vehicle to carry in what was necessary, and fetch away what was not wanted, without disarranging the rest. It was discovered that sulphuric acid was superior to bromine for this purpose, performing the same offices in the same way. The Caro patent is for this improvement. Some say this was merely substituting one well-known equivalent for another; others, that it involved inventive skill. Which are right is of no consequence here now. There is but little, if any, disagreement about the result being the same.

The defendants stoutly invoke Graebe and Liebermann themselves in support of some of their positions. Their statements upon this subject have been observed. They state that they tried sulphuric acid at first, but made the mistake of using too low heats. That "Caro first noticed that anthrachinone, if heated with sulphuric acid to above 200°, would give sulpho-acids. which on fusing with hydrate of potash, formed alizarine, the same as the bromine compound." They describe the development of this process further, and then say, further: The first process is, therefore, identical with the first Womine method given above." They then describe the second method, and add, in conclusion: "On fusing the two sulpho-acids, they give alizarine exactly like the monobrom, and dibrom, anthrachinone." The patent is to the same effect. The specification commences: "This invention relates to improvements on an invention described in letters patent of the United States, granted to Charles Liebermann and Charles Graebe, for improvements in preparing coloring matters, dated the 5th day of October, 1869, No. 95,465, in which the preparation of artificial alizarine is based upon the action of caustic alkalies upon bibrom-anthrakinon or bichloranthraklnon. We have now discovered that a similar result may be obtained by substituting sulphuric acid for bromine or chlorine, in the above process."

Both the intended and the actual identity between the products, as to both source and properties, seem to be clearly established. And the establishment of this is of some importance, bearing upon the question of fact, before considered, as to the likeness between the natural and artificial alizarine. Prof. Chandler, upon whose testimony the defendants appear to most strongly rely, claims that the differences between them have been found

in the product of the latter patent and not in that of the former. This may well have been, because they have not been so much looked for in the former. But, if the products of the two patented processes are identical, as is here found, what he recognizes as differences to some extent in the product of the latter patent would be found in that of the former, if persistently sought after.

These conclusions are more satisfactory, because they are in accordance with those reached in the two former cases upon this same division of this patent, in the one of which, in this district, {Badische Anilin & Soda Fabrik v. Higgin, Case No. 722,} much reliance was placed upon the decision of that in the district of Massachusetts, and the opinion of Judge Shepley there {Badische Anilin & Soda Fabrik v. Hamilton Manuf'g Co., Case No. 721.}

Let there be a decree establishing the validity of this division of the patent, and for an injunction and an account, according to the prayer of the bill, with costs.

{NOTE. On appeal to the supreme court this decree was reversed, (Cochrane v. Badische Anilin & Soda Fabrik, 111 U. S. 293, 4 Sup. Ct. 455,) on the ground that reissued letters patent No. 4,321, claiming "artificial alizarine, produced from anthracene or its derivatives, by either of the methods herein described, or by any other method which will produce a like result," if construed so broadly as to cover the article produced by the process of the Caro patent, is wider in its scope than the original actual invention, and wider than anything indicated in the specification of the original patent; and that, if construed so as to cover only the product which the process described will produce, the reissue is not infringed by the different article produced by the process of the Caro patent.

{For other suits involving the same letters patent, see Badische Anilin & Soda Fabrik v. Cummins. Case No. 720; Same v. Hamilton Manuf'g Co., Id. 721; Same v. Higgin, Id. 722.}

[1] {Reported by Hon. Samuel Blatchford, Circuit Judge; reprinted in 4 Ban. & A. 215; and here republished by permission. Merw. Pat. Inv. 172, contains partial report only.}

[2] {Reversed by supreme court in Cochrane v. Badische Anilin & Soda Fabrik, 111 U. S. 293 4 Sup. Ct 455.}