

in the drawings were used. Such a shoe would have the metal at its ends chill-hardened through the entire mass—the claim requires nothing more. That the claim is invalid, unless the method of producing the chill, as shown and described, is imported into it is hardly disputed. It is insisted, however, that this may be done and should be done. The claim would then read as follows:

“A brake shoe having the metal at its extremities chill-hardened through the entire mass by means of the chill blocks G and H adapted to inclose the shoe at the ends on all sides except the top,” etc.

It is argued that such a chill box produces chill lines running both horizontally and vertically, thus preventing chill cracks and intensifying the chill. Assuming that this contention is susceptible of proof the difficulty is that the claim is not for a method but for a shoe. So far as the proposition now under discussion is concerned, it is as if the specification were absolutely silent on the subject of chill blocks. The claim permits the use of any chill blocks. Where the language of a claim is clear and simple there is no room for construction. The court is convinced that if the patentee has made an invention he has failed to claim it. No patentable novelty can be found in the claim as stated in the patent. The patentee might have claimed a process, he might have claimed a novel chill block; but he has done neither. The court is, therefore, prohibited from giving him a patent limited to an article produced by means of an alleged ingenious device which is not even mentioned in the claim. Were the rule otherwise it would be a dangerous menace to public rights which might be destroyed, not by the patent emanating from the patent office, but by a different patent subsequently granted by the court. Even were there more doubt as to the correctness of this conclusion the court would still be of the opinion that it is for the interest of both parties that the question should be definitely settled before they are required to incur the large expense of preparing for a final hearing. The demurrer is allowed.

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BADISCHE ANILIN & SODA FABRIK v. KALLE et al.

(Circuit Court, S. D. New York. May 8, 1899.)

**1. PATENTS—PRIOR USE IN FOREIGN COUNTRY.**

Under Rev. St. § 4923, mere prior use in a foreign country does not defeat a patent where the patentee is ignorant thereof, and believes himself to be the first inventor.

**2. SAME—ANTICIPATION—PRIOR PUBLICATIONS.**

A description which is insufficient to support a patent cannot be relied upon as an anticipation. Unless the prior publication describes the invention in such full, clear, and intelligible terms as to enable persons skilled in the art to comprehend it, and reproduce the process or article claimed, without assistance from the patent, such publication is insufficient as an anticipation.

**3. SAME—EXTRINSIC EVIDENCE.**

Prior patents and publications alleged to anticipate must be taken in the meaning disclosed upon their face, and extrinsic evidence is not admissible to reconstruct them, as by showing that a word having a sensible meaning in the context was erroneously used for another word.

## 4. SAME—PATENTABLE PRODUCTS.

If a product be patentably new and useful, the patent should be sustained, even though the article may be produced by a process substantially like those used to produce somewhat similar results in the prior art.

## 5. SAME—INVENTION.

The discovery that safranine-azo-naphthol, a coal-tar product, which was long believed to be insoluble, and valueless, was soluble by prolonged washing, so as to produce a cheap and valuable substitute for vegetable indigo, *held* to involve patentable invention.

## 6. SAME—DECISIONS BY FOREIGN COURTS.

A decision by the courts of a foreign country that the discovery of a certain process involved the exercise of patentable invention, while not binding on the courts of this country, is yet entitled to weight as the opinions of trained experts in the country of the inventor where the particular art was best understood.

## 7. SAME—BLUE COLORING MATTER.

The Julius patent, No. 524,254, for improvements in the manufacture of blue coloring matter, whereby a new dyestuff is prepared from safranine-azo-naphthol, *held* valid and infringed.

Livingston Gifford, for complainant.

E. N. Dickerson, for defendants.

COXE, District Judge. This is an equity suit for the infringement of letters patent, No. 524,254, granted August 7, 1894, to the complainant as assignee of Paul Julius, of Ludwigshafen, Germany, for improvements in the manufacture of blue coloring matter. The parts of the specification relied on by the complainant are as follows:

"The ultimate object of my invention consists in a new lake that may be produced as a pigment or upon fiber. It resembles vegetable indigo in color and fastness against washing and light so nearly as to form an artificial substitute for the same such as has been sought for many years by chemists. In arriving at this new lake I have made certain very essential intermediate discoveries or inventions which I also desire to secure by this patent. Thus I have discovered and recognized that a certain class of substances—(safranine-azo-naphthol bodies)—known as 'insoluble precipitates' and regarded as worthless bodies, can be rendered soluble, and then constitute a most valuable dye, and I have proved this discovery by rendering them soluble (as hereinafter further explained) and have hereby enriched the dyeing industry with a cheap dye of most excellent properties, the application of which is founded on transforming it into the above said lake. \* \* \* The compounds resulting from the combination of the safranine-diazo compounds with the unsulphonated naphthols have been mentioned in chemical literature as insoluble precipitates. They could not be applied in the dyeing industry and have since been disregarded and fallen into the rank of useless bodies and were not included in the said German patent. \* \* \* Make a one per cent. solution of safranine, taking one molecular proportion of the safranine used: say, about seven (7) parts of safranine T, or about six and three-fifths (6.6) parts of pheno-safranine, or about seven and seven-tenths (7.7) parts of dimethyl safranine. Diazotize by adding first a solution of sodium nitrite containing about one and four-tenths (1.4) parts of that salt, (one molecular proportion) and then twenty-three (23) parts of hydrochloric acid containing about thirty-three per cent. real acid (HCl). The solution during these operations must be kept cold with ice and stirred. Next run the mixture into an ice-cold solution of about three (3) parts of naphthol—either alpha or beta—(one molecular proportion) in about one hundred and sixty (160) parts of water and twenty-five (25) parts of caustic soda solution, containing about thirty-five per cent. of sodium hydrate (NaOH), stir the mixture thoroughly for several hours, then filter off the blackish violet precipitate of safranine-azo-naphthol thus formed. Now wash well with cold water, prolonging this until the liquor running off is deeply colored and shows that a soluble product has resulted. The paste then remaining

on the filter can be used in dyeing as such or after making up to a standard strength. Or without washing so thoroughly, my new dyestuff can also be prepared in the form of paste, (in which form it best meets the requirements of dyers) as follows: Stir the azo body, obtained as above described, with a little water and mix gradually with hydrochloric acid, until a test portion of the paste obtained is completely soluble in hot water. To prepare the new dyestuff from the quantities of safranine described in the above example, about two and one-fifth (2.2) parts of hydrochloric acid, containing about thirty-three per cent. of real hydrochloric acid (HCl) may be used at this stage of the process. The paste so obtained contains my new dyestuff in the form of a salt and can be diluted or made up to a standard strength. Instead of hydrochloric acid other acids may be used, such as acetic acid, sulphuric, nitric, oxalic, and tartaric acids, also salts which act as acids; but of these hydrochloric and acetic acids give the best results. \* \* \* My new dyestuff, however prepared, is a soluble safranine-azo-naphthol body. It occurs in the dry form and in paste, and forms a dark-colored powder with a slight metallic sheen giving a violet-black paste. It is soluble in both hot and cold water giving violet to blue solutions, insoluble in alkalies, soluble in alcohol and practically insoluble or very slightly soluble in benzene. The dye can readily be recognized by its behavior on treatment with reducing agents, for safranine and amido-naphthol occur in the reduction products. The dyestuffs which I desire to claim generically herein may be recognized as follows: If reduced with stannous chloride and hydrochloric acid, amido-naphthol is produced and can be recognized in any suitable well-known way. On careful and moderate reduction with zinc dust and acetic acid the safranine used in the production is regenerated and shows the characteristic reactions of the members of the safranine series. \* \* \*

"I will now proceed to describe the new lake and the manner of obtaining it.

"Example a.—Dissolve about twenty parts of my new dyestuff in the form of powder (or the corresponding quantity of paste) in about two thousand parts of hot water; allow to cool. \* \* \*

"Example b.—To obtain the lake on cotton fiber proceed as follows:—Take the freshly boiled-out goods, pass them six times through a boiling-hot solution of sumac, and then leave them overnight in the liquid. Next wring out and pass about eight or ten times through a solution of antimony salt; wash well and wring out. Now fill the dye vat with the necessary quantity of water and add the amount of aluminium sulphate mentioned below, then enter the goods and after passing them through the liquid once or twice, remove and wring them lightly by stretching. Add about one-eighth of the dye solution through a fine sieve, pass the goods again six times through the solution, then removing them and stretching as before add again one-eighth of the dye solution, subsequently add a quarter of the dye solution and finally the remainder thereof, manipulating in the same way. \* \* \*

"The dyed goods are of a color resembling indigo, possess a degree of fastness to light and washing exceeding that obtainable with the ordinary aniline dyes and comparing advantageously with indigo itself. The coloring matter may be applied so as not to bleed into the white."

The claims in controversy are as follows:

"(1) As an article of manufacture a coloring matter lake resembling indigo in color, which can be obtained by combining a soluble safranine-azo-naphthol body with a tanno-metallic mordant and which is very fast to light and washing; upon suitable reduction it shows the reactions of safranine, upon treatment with caustic soda it shows the reactions of tannin and it contains a metal, substantially as described.

"(2) As an article of manufacture, the herein-described blue dyestuff which can be obtained from a safranine-azo-naphthol and which may be recognized by the following characteristics: It is soluble in water, upon reduction with stannous chloride and hydrochloric acid, amido-naphthol is produced and upon reduction with zinc dust and acetic acid a safranine is produced, substantially as described."

"(4) The specific blue coloring matter (obtainable by rendering the safranine-azo-beta-naphthol hereinbefore mentioned soluble in water) which possesses the following characteristics: It is soluble in water, gives a blackish-green solution in sulphuric acid and on reduction gives alpha-amido-beta-naphthol and safranine proper, all substantially as described."

The defenses are that the patent is void for lack of invention, that it is anticipated by the prior art and that, properly construed, the defendants do not infringe.

The object of the inventor was to produce an artificial substitute for vegetable indigo which should resemble indigo in color and durability and at the same time be cheaper and more easy of manipulation. Prior to the invention safranine-azo-naphthol was believed to be insoluble, owing to the presence of alkali and salts therein, and was consequently regarded as possessing little practical value. The invention consists in rendering this substance soluble in water either by prolonged washing or by mixing gradually with hydrochloric acid, acetic acid or other similar acids or with salts which act as acids. In either event the product is a safranine-azo-naphthol body soluble in both hot and cold water and in alcohol, giving solutions varying in color from violet to blue. When combined with a tanno-metallic mordant this soluble substance produces a coloring matter like resembling indigo in color and which is very fast to light and washing. Was Julius the first to produce this product? or, to state the question still more narrowly, was he the first to reduce safranine-azo-naphthol to solubility? for upon this discovery the entire invention rests. The de jure date of the invention is January 2, 1892, being the date of the earliest foreign patent. Is the patent anticipated? Section 4886 of the Revised Statutes provides that "any person who has invented or discovered any new and useful \* \* \* manufacture or composition of matter, \* \* \* not known or used by others in this country, and not patented or described in this or any foreign country, before his invention or discovery thereof" may obtain a patent. Section 4923 provides that "whenever it appears that a patentee, at the time of his application for the patent believed himself to be the original and first inventor or discoverer of the thing patented, the same shall not be held to be void on account of the invention or discovery, or any part thereof, having been known or used in a foreign country, before his invention or discovery thereof, if it has not been patented or described in a printed publication." As to prior use the law limits the inquiry to this country. A prior use in a foreign country will not defeat the patent. There is no proof that Julius knew of the facts upon which the alleged prior use in Germany is based. The defense of anticipation, therefore, rests upon foreign patents and publications prior to January 2, 1892. Publications appearing since that time cannot be considered by the court.

The burden of proving anticipation rests upon the defendants and every reasonable doubt should be resolved against them. The Barbed-Wire Patent, 143 U. S. 275, 284, 12 Sup. Ct. 443, 450; Coffin v. Ogden, 18 Wall. 120. Unless the prior publication describes the invention in such a full, clear and intelligible manner as to enable persons skilled in the art to comprehend it and reproduce the process or article claimed, without assistance from the patent, the publication

is insufficient as an anticipation. *Cohn v. Corset Co.*, 93 U. S. 366, 370; *Seymour v. Osborne*, 11 Wall. 516, 555; *Tilghman v. Proctor*, 102 U. S. 707, 711; *Powder Co. v. Parker*, 16 Blatchf. 295, Fed. Cas. No. 625; *Bowers v. Bridge Co.*, 91 Fed. 381, 408.

In *Tyler v. Boston*, 7 Wall. 327, the patent contained the following statement:

"The exact quantity of fusel oil which is necessary to produce the most desirable compound must be determined by experiment." The court says: "A discovery of a new substance by means of chemical combinations of known materials is empirical and discovered by experiment. Where a patent is claimed for such a discovery it should state the component parts of the new manufacture claimed with clearness and precision, and not leave the person attempting to use the discovery to find it out 'by experiment.'"

See, also, *Wood v. Underhill*, 5 How. 1; *Grant v. Raymond*, 6 Pet. 218; *Consolidated Electric Light Co. v. McKeesport Light Co.*, 16 Sup. Ct. 75.

A description which is insufficient to support a patent can hardly be relied on as an anticipation. In each instance the same precision is required. If the alleged anticipating matter leaves the description incomplete requiring extrinsic investigation to make it complete it fails as an anticipation. The principal anticipation, at least the one that has provoked the widest discussion, is founded upon an article which appeared in a French publication, the *Moniteur Scientifique*, in September, 1886, being, in fact, a reproduction of the application of *Beyer & Kegel* for a German patent for the "process for the preparation of blue coloring matters by the combination of diazo-safranines with the phenols." The important parts of the specification are as follows:

"Preparations of blue coloring matters by the combination of diazo-compounds of safranines, obtained by the process described below, with the phenols and their sulfo-acids.

"Description.

"The new coloring matters which we have discovered are distinguished by their beautiful indigo-blue shade. With a view of manufacturing these blues we have studied up to date the following safranines:

"A. Safranines which are obtained by oxidation, etc. \* \* \*

"B. Safranines formed in the same reaction by substituting, etc. \* \* \*

"Example 1. 32 kilograms of pheno-safranine are dissolved in a sufficient quantity of water and 25 kilograms of hydrochloric acid are added. On adding 7 kilograms of nitrite of sodium, the diazo compound of pheno-safranine forms, which is made to run into a liquor containing 22 kilograms of beta-naphthol. The coloring matter forms at once. \* \* \*

"Quite analogous results are obtained with phenol, resorcine, alpha-naphthol or the other naphthol-mono-di, or trisulfo acids.

"The following table shows the shades of color given in dyeing with the new coloring matters prepared from the constituents as given:

"Diazo-safranine with:

"Molecule phenol: bordeaux, insoluble in water.

" resorcin: violet, insoluble in water.

" alpha-naphthol: blue, insoluble in water.

" beta-naphthol: blue violet, insoluble in water."

Here is direct statement that the product produced by following the *Beyer & Kegel* process is "insoluble in water." When the claim of invention rests solely upon the discovery of solubility it is not easy to perceive upon what principle of law or rule of logic an insoluble

product can be said to anticipate a soluble product. In 1892 Julius produced a soluble dyestuff, its chief merit being that it is soluble. In 1886 Beyer & Kegel said they had invented a similar insoluble dyestuff. It is now asserted by the defendants that this published statement voids the complainant's patent; that one skilled in the art, seeking in 1886 to produce a soluble product, would have learned how to do this from a recipe which states on its face that it produced an insoluble product. But this is not the only vulnerable feature of the Beyer & Kegel specification. It says the diazo-compound of pheno-safranin "is made to run into a liquor containing 22 kilograms of beta-naphthol." The specification is silent as to how this liquor is prepared and what are its ingredients. It is a liquor and it contains the beta-naphthol. This is all; nothing else is told. Caustic soda is not mentioned, and yet, it is substantially conceded that solubility or insolubility will result, depending upon the proportion of caustic soda employed, and that this fact was unknown at the time. We have then a prior publication which purports to give a formula for producing an insoluble compound and which omits one of the most important steps, leaving a blank where proportions should be stated with accuracy. Can it be that such a publication anticipates a patent for a soluble product which gives with minute detail all the steps necessary to accomplish that result? Is this *Moniteur* publication the concise and accurate statement which the law requires? Can it be said that it gives to the skilled chemist that precise information which will enable him, without experiment, to produce the dyestuff of the Julius patent? Would a chemist to-day, who knows nothing of the art except the *Moniteur* article and the publications which preceded it, produce a product which infringes the claims of the Julius patent? To ask these questions is to answer them. The court is familiar with no authority deciding that a patent can be overthrown by a document, which, if its statements be true, is, concededly, not an anticipation; and which becomes valuable as a defense only after its falsity is established.

The suggestion is thrown out by one of the witnesses that the statement that the Beyer & Kegel compound is "insoluble in water" is "a mistake, whether a printer's error or error of the composer I cannot say." It is contended that the statement should have been "soluble in water." There is no proof to sustain this contention, but, assuming it to be true, it is wholly beside the mark. If prior patents and publications can be reconstructed by extrinsic evidence to fit the exigencies of the case, the inquiry will no longer be confined to what the publication communicates to the public, but it will be transferred to an endeavor to ascertain what its author intended to communicate. The question is, what does the prior publication say? Not what it might have said or what it should have said. The court has simply to consider what the publication in question has contributed to the art. If it fails to show the invention which it is said to anticipate, the contention that its author knew enough to write an anticipation and intended to do so is grotesquely irrelevant. Were such a rule established the law upon this subject would be thrown into inextricable confusion. The court is inclined to the opinion that

the *Moniteur* publication is entirely consistent in its statements, needs no interpretation and is, upon its face, insufficient as an anticipation.

But it is argued that if the blank in its recipe, which undoubtedly exists, were filled by an appeal to the prior art the resulting product would be the product of the Julius patent. In other words, that a skilled chemist, in 1886, after reading the recipe, would know how to fill the blank and, with the missing link thus supplied, a soluble product would certainly be obtained. That there are many cases where an omitted step is so obvious that it may be supplied from the existing art, may well be admitted, but, for the reasons heretofore stated, it is, at least, doubtful whether this is such a case. Here the omitted step is of the essence of the invention and the art is that of a foreign country, where prior use will not defeat a patent of the United States. It would seem, then, that oral testimony intended to make good so important an omission is within the mischief of the law making the knowledge of foreigners, other than the patentee, inadmissible upon this question. Assuming the inquiry to be pertinent, how then stands the case? The chemical side of this controversy has taken an exceedingly wide range and has ramified into numberless collateral issues some of which have only a remote bearing upon the principal questions involved. The contending theories have been elaborated with a wealth of technical learning which has not failed to excite the admiration of the court. To attempt to follow the excursions of counsel through the bewildering mazes of the testimony will serve no useful purpose. A discussion of all the propositions argued would extend this opinion beyond all reasonable limits even if the court possessed the technical learning necessary to follow these labyrinthian pathways to the end. It is generally true, even in the most complicated cases, that after the testimony has passed through the analysis of a fierce judicial investigation the "precipitate" discloses a few plain, simple and controlling propositions. The duty of the court will be accomplished if the salient facts are discovered and the conclusions therefrom are correctly drawn. Unquestionably the information contained in the Holliday English patent of 1881 furnished the most specific directions, to be found in the prior art, for filling the *Moniteur* blank. Dr. Schweitzer, an expert witness called by the defendants, testifies:

"The English Holliday patent is the only one giving kind or quantity of alkali to be used in the preparation of safranine-azo-naphthol. This Holliday patent is the first printed publication on the subject, the subsequent publications do not mention the quantities or qualities any more, because these details were unnecessary for everybody skilled in the art at the date of those publications."

The patent says:

"I prepare first a solution of, say, 2 parts of naphthol, 1 part of caustic soda and 100 parts of water."

If a chemist, in 1886, had supplemented the *Moniteur* directions with the Holliday recipe the result would have been an insoluble compound, precisely as the *Moniteur* states. This proposition seems to

be conceded on all hands. Dr. Schweitzer, after examining a number of patents and publications says:

"It is seen from these publications that the average amount of alkali to be taken is about 50 per cent."

This is the same proportion stated by Holliday and leads to the same result—an insoluble product. It is doubtful if this testimony was given for the purpose of establishing an existing rule upon this subject. The defendants strenuously insist that the witness had no such intention and that a rule based upon this average is incorrect and was never adopted by the witness. In practice the defendants insist that Dr. Schweitzer adopted a very different rule, using the theoretical amount of caustic soda necessary to form the naphthol-sodium salt, and carbonate of soda to neutralize an excess of acid. It cannot be denied, however, that a chemist might have adopted such an average in establishing the amount of alkali to be taken rather than attempt a separate experiment in each instance. In any view it is important as showing the wide divergence of opinion among skilled chemists existing at the time. The Muhlhauser-Griess rule when interpreted by the complainant produces an insoluble product if used to fill up the *Moniteur* blank. If interpreted as the defendants insist it should be, it produces the product of the Julius patent. This is also true of several other recipes relied on by the defendants. In short, the prior art was in such a state of confusion and uncertainty so far as safranin-azo-naphthol is concerned that if a chemist had arrived at the correct proportion of caustic soda to produce solubility it would have been rather from chance than from any definite and reliable teaching of the art. The probabilities were in favor of his producing an insoluble product.

The proof leads to the conclusion that although some chemists might have used and, perhaps, did use the correct quantity of alkali, there was no definite and certain guide on the subject. Certainly it has not been established that such a guide existed. It is hardly an exaggeration to assert that had the chemists of 1886 attempted separately, and without a consensus, to write the proper proportions into the *Moniteur* blank there would have been almost as many recipes as there were chemists. If there were any well-known and generally recognized rule this record of over 2,000 printed pages would have been an impossibility. An almost acrimonious contest between learned experts in which after weeks and months of weary disputation they leave the field covered with dead and dying theories, is hardly consistent with the proposition that the rule in controversy was so universally recognized that no disagreement could have existed regarding it. The burden of establishing the existence of the rule was on the defendants. They have not sustained this burden. The view most favorable to them is that the subject is left in confusion and doubt. The existence of doubt defeats anticipation.

The foregoing considerations make it unnecessary to discuss in detail the other anticipatory references. Many of them are mere skeletons, the information contained is fragmentary and, in each instance, falls far short of the clear and precise statement required by the law. Before discussing the question of invention it is well that the law ap-



plicable to product and process patents should be kept in view. The supreme court say:

"A machine may be new, and the product or manufacture proceeding from it may be old. In that case the former would be patentable and the latter not. The machine may be substantially old and the product new. In that event the latter, and not the former, would be patentable. Both may be new, or both may be old. In the former case, both would be patentable; in the latter neither. The same remarks apply to processes and their results. Patentability may exist as to either, neither, or both, according to the fact of novelty, or the opposite. The patentability, or the issuing of a patent as to one, in no wise affects the rights of the inventor or discoverer in respect to the other. They are wholly disconnected and independent facts." *Rubber Co. v. Goodyear*, 9 Wall. 788, 796.

If one discovers a new and useful product he is entitled to the full benefit thereof no matter how it may be produced. *Merrill v. Yeomans*, 94 U. S. 568. A patent for a product must produce, by the process it describes, that article and no other. If the article be old it cannot be the subject of a patent even though made artificially for the first time. "Every patent for a product or composition of matter must identify it so that it can be recognized aside from the description of the process for making it, or else nothing can be held to infringe the patent which is not made by that process." *Cochrane v. Badische Anilin & Soda Fabrik*, 111 U. S. 293, 310, 4 Sup. Ct. 455, 464. A product is not patentable upon the ground that an already known article is made more perfectly by the new process or machine than it was before. If this rule were otherwise the product of each successive machine would be patentable. Improvements in degree or quality are not the subject of a patent. *Wooster v. Calhoun*, 11 Blatchf. 215, Fed. Cas. No. 18,035. "A new process is usually the result of discovery, a machine of invention." *Corning v. Burden*, 15 How. 252. "A distinction must be observed between a new article of commerce and a new article which, as such, is patentable. Any change in form from a previous condition may render the article new in commerce. \* \* \* When certain properties are known to belong generally to classes of articles, there can be no invention in putting a new species of the class in a condition for the development of its properties similar to that in which other species of the same class have been placed for similar development." *Glue Co. v. Upton*, 97 U. S. 3.

The claims in question cover a new article of manufacture—a product as distinguished from a process. This product may, says the patent, be produced by either of two alternative and equivalent processes, namely, by treating safranine-azo-naphthol with an acid or by washing it with cold water. The third claim of the patent is designed to cover the acid process. The washing process is not claimed as new. Applying the law as above stated to the case in hand the court understands the rule to be that if the coloring matter of the claims be patentably new and useful the patent should be sustained even though this coloring matter were produced by a process substantially like those used to produce somewhat similar results in the prior art. It was thought at the argument, and subsequent examination has confirmed the impression, that the most vulnerable part of

the complainant's patent is the part which deals with the washing process. If it did not involve discovery so to treat the body on the filter the patent cannot be upheld. On the other hand, if the use of this process can be sustained as patentable there can be little difficulty in upholding the alternative acid process, which is much more complicated and abstruse. The washing-out process is given preference by the patentee and can be readily comprehended by a layman. No special chemical knowledge is necessary. What is the washing-out process? After describing the mixture on the filter the patentee proceeds as follows: "Now wash well with cold water, prolonging this until the liquor running off is deeply colored and shows that a soluble product has resulted." This is all there is of the process as stated in the specification. The body thus washed was insoluble because it was impure. It contained alkali and salts and their presence prevented solubility. Their removal by washing made the body soluble. At least this is what the patent implies. The argument for the defendants may be summarized as follows: Julius did not invent safranine-azo-naphthol. He did not invent soluble safranine-azo-naphthol. The substance, even on the statements of the patent alone, existed in the prior art. This solubility was not recognized because the body was admixed with salts and alkali. The moment these were washed away the soluble body, which was at all times present, was revealed. The patentee did not create a soluble dyestuff, but he found it by the same method that a miner finds the grains of gold by washing away the mineral substances which hide them. Assuming that Julius was the first to subject safranine-azo-naphthol to washing, this did not involve invention. One is dealing with a substance supposed to be insoluble; he becomes curious to know whether it will dissolve in water; what is the first thought to enter his mind? Whether he be chemist or lawyer he will conclude that the best way to ascertain whether it will dissolve in water is to put it in water and await the result. Should it prove slow in dissolving, naturally, he will stir it as he stirs the sugar in his coffee when he wishes to accelerate the dissolving process. The fact that the idea of making a soluble dyestuff from safranine-azo-naphthol first occurred to the patentee does not aid him. A mere abstract idea is not patentable irrespective of the means described for carrying it into execution. If when the question arises the answer is self-evident there can be no patentable novelty in carrying out the idea. Given a new material whose characteristics are not definitely known, should the following questions suggest themselves to any person interested in ascertaining its properties, would not the following answers simultaneously occur to him? Will it melt? Subject it to heat. Will it float? Put it in water. Is it elastic? Stretch it. Is it soluble? Place it in fluid. If the washing process would occur to the ordinary dyer how much more would it occur to the learned chemist accustomed to the almost daily use of similar methods to produce similar results. The patent is addressed to a comparatively small body of men—those familiar with the dyeing art—and particularly to that select band of chemists who have made coal-tar colors a specialty. Dr. Julius is an accomplished chemist and so are most of the witnesses. The

question of invention must be considered from the point of view of these men. That which seems to the ordinary layman to involve the exercise of extraordinary mental power is to these men nothing but the everyday work of laboratory routine. When it became desirable to ascertain whether the body was or was not soluble the method of doing this which first occurred to the patentee was to wash it. The moment the necessity for the information was presented to his mind he knew exactly how to obtain it. He did not have to construct any new implements to make the test, they were ready at his hand. He knew, because he says so in the specification, that the body was insoluble because of the presence of alkali and salts. He knew, because he says so in the specification, that if he destroyed the influence of these impurities which prevented solution he would, or, at least, that he might, obtain the body in a soluble form. He knew that in order to find out the properties of the body he must have the body pure and that no simpler method was known to chemistry for producing a pure body than to wash away the impurities. In short, it is said that Julius is not entitled to a patent for discovering, by a well-known process, that a soluble body is soluble.

The court has thus endeavored to state in a concise form the argument against patentability as strongly and fairly for the defendants as the proof permits. Nothing has been omitted which, in the opinion of the court, tends to add to the force of the defendants' contention. It was thought, in view of the great mass of testimony and the elaborate and conflicting arguments and opinions presented, that the most satisfactory way of analyzing and testing the strength of the defendants' position was to reduce, briefly, their propositions to writing and compare them with the complainant's arguments similarly stated.

The question thus presented is an interesting one and for some time after the case was taken up for decision the court was in doubt as to what the answer should be. That the defendants' contention is plausible and cogent cannot be gainsaid, but the more the record has been studied—the investigation involving months of labor—the more settled has become the conviction that the defendants have not succeeded in voiding the patent and that the question must be answered in favor of the complainant. The reasons for this conclusion may be stated as follows: It is thought that an impartial mind after reading the record must reach the conclusion that the most favorable view for the defendants is that the question is involved in doubt. If there were no preponderance in favor of the complainant, if the scales of proof hung with even balance, it would still be the duty of the court to resolve the doubt in favor of the complainant. The presumption deducible from the patent itself is that it is valid. He who asserts to the contrary must prove it; the burden is on him. The defendants have not done this; they have not shown by proof which outweighs the complainant's proof that there is no patentable novelty in the process under consideration. Again, there is a distinction of in dealing with invention and discovery which must not be lost sight of in dealing with process patents. Of course, a discovery to be patentable must have the attributes of an invention, but the mental

operation is somewhat different in one who invents a machine and one who discovers a process. The basic truth upon which rests a process may come to the discoverer suddenly and unexpectedly. He may not understand the law upon which the process operates, and he may be unable to explain the cause of certain phenomena, nevertheless, if he be the first to give to the world as a result of his method a new and valuable article of manufacture he is entitled to protection. The laws of nature are all old, but as men of genius become more and more familiar with their characteristics they are able to utilize these laws and make them tributary to the progress of mankind. Electricity, for instance, is as ancient as the universe, and yet it is only within the present century, almost within the present generation, that the world has been lighted up and distant peoples have been brought together by the discovery of its marvelous properties. Should an electrician, by well-known electrical methods, produce some new product which revolutionizes the art, patentability will hardly be denied him because electricity and the material on which it operated were both old. For example, should some material be discovered which solves the storage battery problem, it is hardly to be presumed that he who confers this benefit upon mankind will be denied a patent, because the material on which he operated was well known and his process had been used before on other materials to produce different results. And so a chemist who first discovers that a substance believed to be useless can, by a simple process, be transformed into an article of great value, should not be defeated by a similar line of attack. As well might it be said that the astronomer who discovers a new planet should be robbed of the credit of his achievement, because his telescope was old and other astronomers had used it to examine Saturn and Mars. The mere selection of a material, and this, too, by a process of exclusion, has been deemed sufficient to sustain patentability, and the patent law abounds in instances in which patents have been upheld where the inventor stumbled upon the discovery in total oblivion of the reason why effect followed cause.

In the case at bar it is not, then, material to know why certain results are produced or to prove that the inventor knew the reason therefor. It is enough that he has produced an entirely new and useful product by a method which, though abstractly old, had never been applied to the material in question which was supposed to be incapable of such treatment. Dr. Julius was the first to produce the blue dye-stuff of the claims. The court does not overlook the fact that the defendants insist that there was a prior use by Beyer & Kegel in Germany, but, for the reasons heretofore stated, a discussion of this question is not germane to the issue. In the eye of the patent law of this country Julius was the first to produce "indoin blue." This fact is overwhelmingly proved and must be taken as established. It is a fact of immense weight in determining the question of invention. Indoin blue was a success from the start and its sale has steadily increased. To produce a cheap, artificial, soluble substitute for indigo, possessing many of its advantages and in some respects superior to indigo, was surely no mean achievement. Learned chemists in Germany and England, and probably in other countries, had long been

experimenting to produce a result the importance of which was universally recognized, but Julius was the first to succeed. Indoin blue is now one of the leading dyes of commerce. Safranin-azo-naphthol was believed to be useless as a water-soluble dyestuff. So general was this belief that it is not surprising that experiments were few. A conservative and timid chemist would have accepted the prevailing opinion as conclusive and bent his energies in other directions. It required a man of boldness and originality to break through existing prejudices, strike out on new lines and make a discovery which his reading taught him to be impossible. The fallacy of the defendants' argument seems to be that it assumes that the chemist knew that the body upon which he intended to operate was or might be soluble. Assuming the very fact in controversy, of course, there is no invention, but the value of the discovery of Julius is based upon the proposition that neither he nor any one else knew the fact of solubility, but on the contrary the belief was universal that the body was worthless, because insoluble. It was because Julius found out that by persistent washing, a substance, as worthless as gravel or sand, could be converted into a dyestuff of inestimable value, that he made an invention of decided merit. Of course, if what Julius knew was known before and if what he did had been done before the pretense of invention would be absurd. Invention is predicated of the incontrovertible fact that solubility was unknown and that the body had never before been subjected to the Julius processes. This position is clearly and fairly explained by the leading expert witness for the complainant. He says:

"The novelty of the patent consists in securing solubility in a body previously believed to be insoluble by the application to such body in a thorough manner of the well-known process of washing. And, in that sense, there is nothing new in such process of washing, the novelty being in its application to this body, and in the unexpected result of producing solubility, or a soluble product."

Invention was sustained by the German patent office in the contest with Farbenfabriken. The decision is as follows:

"The production of valuable dyestuffs from the hardly usable safranin-azo-naphthol by converting the latter into salts soluble in water, which have hitherto not been described, is to be regarded as a patentable invention. Compare herewith the decision of the imperial court of the 27th June, 1891. (Patent Journal 1891, page 433, second column.)"

Again, in 1894 there was a stubborn opposition by five rival manufacturers to complainant's application for a patent covering the washing process now under consideration. The patent was granted, the decision being in the following words:

"The reasons advanced in the oppositions to the patentability of the process in question are not in point. The process claimed for the systematic further washing out of safranin-azo-naphthol has been regarded as an invention because it was not known as such before the application was filed, nor had it been in public use in this country, whilst on the other hand, there can be no doubt that it is in a high degree capable of technical use."

An appeal was taken, but it was dismissed in these words:

"It has not been proved that it was known before the application that the coloring matter bases produced, according to the patent No. 61,692, and re-

garded as insoluble in water, are, after sufficiently thoroughly carried out washing soluble in water. The production of these coloring matters in the form soluble in water, by continuing the washing out to a definite end, appears to be, technically, of great importance; therefore, an unexpected technical success has been achieved. The process of the application described is, therefore, a patentable invention."

These decisions are in no way controlling upon this court, but they are valuable as the opinions of trained experts in the country of the inventor and where the art is best understood. The opinions of such men, learned, able and disinterested, officially expressed after thorough examination, are persuasive to say the least.

The new dyestuff is described with all necessary technical precision in the claims. This product being absolutely new with Julius and being of great commercial value his patent should not be destroyed unless proof of undoubted cogency is presented showing that his processes were so rudimentary and axiomatic that no inventive skill was required in employing them. The court is of the opinion that the weight of testimony is to the effect that the ordinary manufacturing chemist would not have thought of applying the washing process to safranin-azo-naphthol and if he had done so he would have abandoned it as hopeless long before he reached the Julius product. If he turned to his text-books he would find nothing to encourage him to proceed. If he searched contemporaneous literature on coal-tar colors he would be convinced that it was hopeless to expect to find the prize in this barren, uncultivated and abandoned azo-naphthol field. No precedent in the prior art would help him. He would look in vain for any analogous insoluble body which had been converted into a soluble body by washing. One of the complainant's witnesses says:

"This process of converting insoluble safranin-azo-naphthol into a soluble product is to this day a unique invention. There is no other body of the naphthol-azo series which can be rendered soluble by a mere washing out with water. \* \* \* Whatever may be the theoretical explanation of the change which occurs, it is a unique change, and I know of nothing analogous to it in the whole range of dyestuff chemistry."

In short, there was nothing to direct the chemist to the fact that safranin-azo-naphthol could be converted into a soluble coloring matter and the discovery that it could be required something more than the ordinary skill of the laboratory. Whether or not solubility is due solely to the removal of admixed impurities is left in doubt by the proof. The language of the patent certainly tends to support the affirmative of this proposition, but there are strong presumptions the other way and the precise nature of the change from insolubility to solubility, and the reason therefor, is not explained and, apparently, cannot be explained by the testimony. Whatever the reason, the fact remains that solubility results from a treatment which produces wholly unexpected and unique phenomena; a treatment which was never before applied to the body in question and which would fail of result if applied to any analogous body. The complainant's principal expert witness, Dr. Morton, says:

"All I know on this subject is that, when produced by following the process down to the point indicated the product is, as I understand the word, substan-

tially insoluble. That is, approaching in its lack of solubility ordinary stones, minerals and the like. If an attempt is made to wash this material, the first applications of water have substantially no effect upon the solubility, but when a certain point is reached, which, as I understand it, is the point at which certain mineral substances are removed from the entire mass, then it becomes substantially soluble."

The earlier washings gave no evidence of solubility and here the ordinary chemist would stop, but Dr. Julius prolonged the washing until the deep blue color evidenced the fact that the body had become soluble.

It is unnecessary to pursue the subject further. What has been said already applies also to the acid process, which, as before stated, is, in the opinion of the court, entitled to greater consideration than the washing-out process. The fundamental proposition upon which the validity of the patent rests applies equally to both processes. Dr. Julius has given to the world a new dyestuff of great value. The methods by which he accomplished this result seem simple enough now, but they were open to the chemical world and no one ever applied them to safranine-azo-naphthol before. From the refuse heaps of chemistry he took a comparatively worthless and neglected body and transformed it into a substance capable of producing wealth "beyond the dreams of avarice." One who has done so much should not be turned out of a court of equity upon the theory that his achievement was so simple that it might have been performed by the most commonplace chemist in the art. Results accomplished cannot be anticipated by results which might have been accomplished. Eliminate the work of Julius and the dyeing art would to-day, in all probability, be without indoin blue. There is nothing to indicate that any of the chemists of Germany or England were proceeding on lines which would have led to the discovery. Surely there is a persuasive presumption that one who contributes such a valuable product to the world is something more than a skilled artisan.

There is no doubt at all that the defendants infringe. Bengaline differs from indoin blue in name only and its sale as proved constitutes an infringement of claims 2 and 4. It is sold in connection with printed circulars and oral directions describing and recommending its use with a tanno-metallic mordant thus producing the coloring matter lake covered by claim 1.

There should be a decree for the complainant.

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ROSE v. HIRSH et al.

(Circuit Court of Appeals, Third Circuit. May 4, 1899.)

No. 26, March Term.

**1. PATENTS—INFRINGEMENT—MEASURE OF DAMAGES.**

Where the patentee himself manufactures the patented article, and maintains a close monopoly, so that one desiring to use it could purchase it only from him, it is proper, in case of wanton infringement, to conclude that but for the infringement the infringer would have purchased the articles from the patentee, and consequently that the latter is entitled to all damages resulting from the loss of such sales.