

Case No. 5,584. GOODYEAR v. RUST.

[6 Blatchf. 229; 3 Fish. Pat. Cas. 456.]¹

Circuit Court, D. Connecticut.

Nov. 7, 1868.

PATENTS—HARD RUBBER—VULCANITE.

The use of the process described in the patent granted to Edward L. Simpson, for preparing hard rubber or vulcanite, is an infringement of the Nelson. Goodyear hard rubber patent.

[Cited in Edison Electric Light Co. v. Beacon Vacuum Pump & Electrical Co., 54 Fed. 679.]

This was a motion [by Henry B. Goodyear and others] for a provisional injunction to restrain the defendant [T. S. Rust], who was a dentist, from infringing letters patent reissued to Henry B. Goodyear, administrator of Nelson Goodyear, deceased, May 18, 1858, and more particularly referred to in the report of the case of *Goodyear v. Berry* [Case No. 5,556]. The defendant was using the Simpson rubber described in letters patent granted to Edward L. Simpson, October 16, 1866, the nature of which is set forth in the opinion of the court.

Charles F. Blake and Hubbard & Hyde, for plaintiffs.

Stephen D. Law and H. T. Blake, for defendant.

SHIPMAN, District Judge. The validity of this patent has been so often sustained by adjudications, that no question will be considered, in deciding the present motion, except that of infringement. The bill of complaint in this case is supported by affidavits, which clearly entitle the plaintiffs to the injunction prayed for, unless the defendant's proofs overcome or avoid their effect. The defendant works under the patent of Edward L. Simpson, and uses the compound made in accordance with the process described in that patent. The plaintiffs allege, that this process is clearly within the scope of Goodyear's invention, as described in his patent, and is, therefore, an infringement of their rights. This is denied by the defendant, and the question, so far as it is necessary for the determination of this motion, is now to be decided.

Avoiding all useless rehearsal of the details of this Goodyear patent, and of the repeated litigations to which it has been subjected, it may be briefly stated, that the process covered by it is secured by mixing about four ounces of sulphur and one pound of rubber, and subjecting this mixture to not less than from 260° to 275° of heat, Fahrenheit's scale. This, under proper conditions of place and time, produces the compound or substance known as "vulcanite,"

GOODYEAR v. RUST.

a material now well known in the mechanic arts. The vital question involved in the present controversy, relates to the proportions of sulphur and rubber, and the degree of heat. Does the Simpson process substantially embrace these proportions and this degree of heat? If it does, then it is an infringement of the plaintiffs' rights.

The defendant denies that the Simpson process does embrace all these proportions, as effective agents or active forces in accomplishing the work of vulcanization. In support of this denial, he has adduced affidavits of distinguished chemists, who give a delineation of the elements which enter into Simpson's mixture and produce his vulcanite. It will be sufficient, in this place, to refer to the affidavit of Professor Seely, as that contains all the materials of the defence to this motion. Professor Seely says, that the substances used by Simpson in the preparation of his hard rubber, are sulphur, gum-benzoin, oil, and common rubber, and that his manner of using these substances, as set forth in his patent, is as follows: He mixes two ounces of benzoin with sixteen ounces of sulphur, and to sixteen ounces of this mixture he adds one quart of linseed oil. This mixture, of sulphur, benzoin, and oil is then subjected to the proper degree of heat, and the result is the substance which he calls his "vulcanizing compound." To make hard rubber, or vulcanite, he takes from ten to fourteen ounces of this compound and one pound of rubber, and thoroughly mixes them, by grinding between warm rolls. He then subjects this mixture of rubber and vulcanizing compound to a heat of 320° Fahrenheit. The result is a vulcanite.

Without rehearsing the details of the analysis presented by Professor Seely, it may be stated, that the quantity of this compound which is necessary to perfectly vulcanize one pound of rubber, contains, in some form, not much less (to use the language of Goodyear's specification) than four ounces of sulphur. In other words, this amount of sulphur goes into this quantity of the compound, and forms one of its original elements. About half of this sulphur chemically combines with the oil, and forms what Professor Seely calls "vulcanized oil," and the other half exists, in the mass of vulcanized oil, in the form of free sulphur. Vulcanized oil alone, when mixed with rubber, will not vulcanize the latter, according to the evidence before me. Professor Seely says: "The effect of vulcanized oil, on mixing and heating with rubber, is not at all chemical. The rubber does not, in any chemical sense, become vulcanized. Whatever advantage there be in the use of vulcanized oil with rubber, must be wholly due to physical and molecular causes, and cannot be accounted for on any theory of vulcanization based on Goodyear's processes. A quantity of vulcanized oil containing four, or even sixteen, ounces of sulphur, may be mixed and heated with one pound of rubber, and not an atom of Good-year's hard rubber can be produced." He then goes on to say: "Simpson's compound is composed of vulcanized oil and free sulphur. When the compound is rolled and heated with rubber, the free sulphur, no doubt, acts upon the rubber with its full efficiency; and, in estimating the vulcanizing, or hardening, properties of the compound, the value of the free sulphur, if

any, must be conceded. It is, therefore, necessary to compute the amount of free sulphur in Simpson's compound." This computation he then proceeds to make, and the result is, as I have stated—one-half of the sulphur is combined with the oil chemically, and the other half remains free, or, as Professor Silliman expresses it, is "entangled in the mass of this compound." Professor Seely says, of this compound: "The free or effective sulphur is exactly one-half of the whole contents of sulphur." What part the benzoin, plays in the compound does not appear from the evidence. But I gather, from Simpson's specification, that "its vaporizing qualities more perfectly expel the fumes of the sulphur, as well as the odor from the oil, and render the compound nearly, if not perfectly, odorless." In the performance of this office, it may be an improvement on Good-year's process.

It is conceded, then, that vulcanized oil (oil and sulphur chemically combined) will not produce, when mixed with rubber and heated, vulcanite. There is no proof that the benzoin renders the vulcanized oil any more effective as a vulcanizing agent. It is equally conceded, by the defendant's evidence, that the quantity of free sulphur in Simpson's compound cannot alone vulcanize. It is asserted that the vulcanized oil, and the free sulphur scattered through it, do successfully vulcanize, whenever the mass of compound applied to one pound of rubber contains, in the whole, not much less than four ounces of sulphur in all, free and combined. Such a proportion of the mass to the pound of rubber is necessary to comply with the conditions of Simpson's patent. We have, then, Goodyear's invention, which consists in combining not much less than four ounces of sulphur, with one pound of rubber, and submitting the same to not much less than 260° to 275° of heat, Fahrenheit's scale. We have Simpson's process, which consists in combining not much less than four ounces of sulphur, with one pound of rubber, and subjecting the same to a heat of 320°, Fahrenheit's scale. The distinction which is sought to be made between these two compositions, or processes, is founded upon the claim that, in Simpson's one-half of the sulphur is first chemically combined with oil, forming a new substance termed vulcanized oil, and, while there, though acting in the same mass with the remaining half of the sulphur, as an auxiliary vulcanizing agent, acts in a

GOODYEAR v. RUST.

different way from the free sulphur itself. In other words, half the quantity of sulphur necessary to vulcanize under Goodyear's process, has disappeared, and exists no longer, except as it is represented in a new chemical substance called vulcanized oil. The other half remains. But neither the half that remains, nor any quantity of the new agent, can alone vulcanize. Yet the two, acting together, at once perform this important office, and produce the same result as Goodyear's combination.

I have said that it appears, from the evidence, that the chemically combined elements of the compound of Simpson will not alone, when mixed with rubber, and heated, produce vulcanite. I infer this from the language already cited from Professor Seely's affidavit, where he says: "A quantity of vulcanized oil containing four, or even sixteen, ounces of sulphur may be mixed and heated, with one pound of rubber, and not an atom of Goodyear's hard rubber can be produced. Simpson's compound is composed of vulcanized oil and free sulphur." I have not failed to notice that the language is, that the vulcanized oil, in combination with the rubber, will not produce "an atom of Goodyear's hard rubber." But, as the whole scope and direction of the defence are aimed at establishing a distinction between the processes, and not between the products, I can come to no other conclusion than that the compound alone, if destitute of free sulphur, would not, when mixed with rubber, perform the office of vulcanization. It is true, that the compound when made according to" the patent of Simpson, always contains one-half of the sulphur in a free state, but it is agreed, on all hands, that this amount of free sulphur alone will not vulcanize. So the evidence, in whatever light we view it, proves that that portion of the compound which contains the elements in chemical combination is powerless, without the aid of the uncombined free sulphur, which is scattered through the pores of the combined mass.

Now, it may be asked, how do these two agents, namely, vulcanized oil and free sulphur, perform, by their united forces, the work of vulcanization? No part of this work, is assigned, by the evidence, to the benzoin. It cannot be done by the chemically combined oil and sulphur alone. It cannot be done by the free sulphur alone. The latter, to the extent of its effective power, for all that appears in this case, works in the same way that it does in Goodyear's process. The effect of the former, (oil and sulphur Chemically combined,) Professor Seely says, is not chemical, but "must be due wholly to physical and molecular causes." But, whether the auxiliary vulcanizing force, whatever it is, exerted by the chemically combined oil and sulphur, is supplied by the latter or not does not appear by the proof. From what has long been known, however, of the vulcanizing power of sulphur, when mixed with rubber, and heated, that agent, though combined with another substance, would naturally be looked to as the seat of this force. It may be true that, as Professor Seely says, the effect of vulcanized oil, in hardening rubber, is due not to chemical, but "to physical and molecular causes." Of the nature or significance of

this distinction, in the scientific sense, I do not presume to speak. But I do not see how this fact avoids Goodyear's patent I do not find, in his specification, any evidence that he rested his invention upon any such nice scientific distinction, or that he limited his claim to sulphur, when working through chemical, as distinguished from physical or molecular laws. If the validity of his patent rests upon such a scientific problem as this, I think its solution should, in the present case, be left to final hearing. The suggestion of such a problem, in ex parte affidavits, at a very late stage of a series of protracted litigations, in which every other defence has thus far failed, is not a valid answer to this motion. There can be no question that Simpson uses a degree of heat within the scope of Goodyear's patent Let an injunction issue.

{For other cases involving this patent see note to [Goodyear v. Mullee, Case No. 5,577.](#)}

¹ {Reported by Hon. Samuel Blatchford, District Judge, and by Samuel S. Fisher, Esq., and here compiled and reprinted by permission. The syllabus and opinion are from 6 Blatchf. 229, and the statement is from 3 Fish. Pat. Cas. 456.}