U. S. INDUSTRIAL CHEMICALS, INC. *v.* CARBIDE & CARBON CHEMICALS CORP.

CERTIORARI TO THE CIRCUIT COURT OF APPEALS FOR THE FOURTH CIRCUIT.

No. 680. Argued March 13, 1942.—Decided March 30, 1942.

1. A reissue patent must be for the same invention as the original patent. R. S. § 4916. P. 675.
2. Original Patent No. 1,998,878, to Lefort, for a process for the production of ethylene oxide, called for the introduction into a heated reaction chamber of ethylene and oxygen, in the presence of a catalyzer, and also, as an essential, the voluntary introduction of water. Reissue Patent No. 20,370, in describing the process, treats the voluntary introduction of water as permissive but not mandatory. *Held*, that the reissue is void. P. 677.
3. Although it is the duty of a court to determine for itself, by examination of the original and the reissue, whether they are for the same invention, it is permissible, and often necessary, to receive expert evidence to ascertain the meaning of a technical or scientific term or term of art, so that the court may be aided in understanding not what the instruments mean but what they actually say. P. 678.
4. It is inadmissible to enlarge the scope of the original patent by recourse to expert testimony to the effect that a process described and claimed in the reissue, different from that described and claimed in the original patent, is, because equally efficacious, in substance that claimed originally. P. 678.
5. The omission from a reissue patent of one of the steps or elements prescribed in the original, thus broadening the claims to cover a new and different combination, renders the reissue void, even though the result attained is the same as that brought about by following the process claimed in the original patent. P. 678.

121 F. 2d 665, reversed.

CERTIORARI, 314 U. S. 603, to review the affirmance of a decree of the District Court upholding a reissue patent in a suit for infringement.

Mr. William H. Davis, with whom *Messrs. Thomas D. Thacher* and *Dean S. Edmonds* were on the brief, for petitioner.

Mr. Samuel E. Darby, Jr., with whom *Messrs. Leonard A. Watson, Clair V. Johnson,* and *Clair W. Fairbank* were on the brief, for respondent.

MR. JUSTICE ROBERTS delivered the opinion of the Court.

This is a suit by the respondent to restrain the petitioner from infringing claims 8 and 9 of reissue patent No. 20,370. The application for reissue was filed September 25, 1936, and granted May 18, 1937. The original patent was No. 1,998,878, applied for March 22, 1932, and granted April 23, 1935, to Theodore Emile Lefort, of Paris, France, for a "Process for the Production of Ethylene Oxide." The application was based on earlier French patents. The respondent purchased the United States patent in April 1936 and, as a result of its study thereof, the patentee was persuaded to apply for the reissue.

If the reissue patent is valid, no question is now raised as to petitioner's infringement of the claims in suit. The District Court held the patent valid and infringed.[1] The Circuit Court of Appeals affirmed.[2] We took the case because of an apparent conflict with decisions of this court and several Circuit Courts of Appeals, to the effect that a reissue patent must, under the statute, be for the

[1] 34 F. Supp. 813.

[2] 121 F. 2d 665.

same invention as the original patent.[3] The petitioner also raised a question as to intervening rights which, in the view we take, need not be considered or decided.

Ethylene is a hydrocarbon gas, C_2H_4. For a long time it was thought impossible directly to oxygenize it to form C_2H_4O by bringing oxygen and ethylene into contact, though the formation of ethylene oxide by direct oxidation was commercially desirable. Efforts at direct oxidation, instead of producing the oxide, resulted in less desirable oxygenated compounds such as aldehydes. Lefort conceived the idea of effecting the oxidation by catalytic reaction, that is, the use of a substance, which, in some unexplained way, causes a chemical union or reaction when the two substances to be affected are brought into contact in its presence under given conditions. He recognized one incident of the direct oxidation process as applied to ethylene tending to decrease its efficiency, namely, that, in addition to the principal reaction producing C_2H_4O, there occurs a side reaction by which a portion of the ethylene is converted into carbon dioxide and water, and, to that extent, the ethylene is wasted. He found that, by certain control of the process, this side reaction could be so restricted as not to decrease the production of ethylene oxide below a profitable level.

According to both the original patent and the reissue, ethylene and oxygen are to be introduced into a heated reaction chamber in the presence of a catalyzer. The petitioner insists that the original patent also treats as

[3] R. S. 4916, 35 U. S. C. § 64: "Whenever any patent is wholly or partially inoperative or invalid, by reason of a defective or insufficient specification, or by reason of the patentee claiming as his own invention or discovery more than he had a right to claim as new, if the error has arisen by inadvertence, accident, or mistake, and without any fraudulent or deceptive intention, the Commissioner shall . . . cause a patent for the *same invention*, and in accordance with the corrected specification, to be reissued. . . ." [Italics supplied.]

a mandatory or necessary step the voluntary introduction of water, whereas the reissue in specification and claims 8 and 9 omits this requirement, and therefore describes a different process. The respondent, on the other hand, asserts that as both patents describe the oxygen of air as that which may be used, and as atmospheric air contains moisture, the first, specifying water, and the reissue specifying air, both contemplate the introduction of water in some form and therefore are for the same process.[4] This dispute must be resolved by a comparison of the disclosures of the two instruments. If that comparison leads to the conclusion that the reissue is not for the same invention as the original, the reissue is void as not within the terms of the statute.

We shall postpone discussion of the tests of identity or difference of invention, and the use of expert testimony, to a statement of the criteria of judgment furnished by the language of the specifications and claims of the two documents.

The opening paragraph of the original patent is:

"This invention has for object a process for the production of ethylene oxide which mainly consists in subjecting ethylene to the simultaneous action of the oxygen of air and of water, in presence of a catalyzer and, if need be, of hydrogen."

After referring to the use of hydrogen as optional, the specification deals with the character and composition of metals to be used as catalyzers. It then speaks of the elements to be used to obtain the desired reaction thus:

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[4] No question of unreasonable delay is presented. Compare *Mahn* v. *Harwood*, 112 U. S. 354, 363; *Ives* v. *Sargent*, 119 U. S. 652, 661; *Topliff* v. *Topliff*, 145 U. S. 156, 169. Nor have we occasion to decide what may be the scope of permissible court review of the commissioner's determination that the error of the patentee arose "by inadvertence, accident or mistake, without fraudulent or deceptive intention."

"The ethylene can be obtained from any source of supply: . . .

"Water can be admitted in the reaction vessel, either in the liquid state, or as steam.

"The oxygen can be the oxygen of the air, this latter gas being introduced in the reaction."

Immediately following, it is said:

"The efficiency of the reaction is increased by diminishing the CO_2 which is formed, by introduction, in this reaction, of a suitable quantity of water. A suitable volume of CO_2 can also be previously introduced in the reacting gases."

The CO_2 which it is desired to diminish is that which is formed by the undesirable side reaction above mentioned. This reaction is again mentioned, and the introduction of water again specified thus:

"Moreover, the applicant has found that the reaction giving CO_2 is, contrarily to previous belief, a reaction of oxidation independent from that giving ethylene oxide and from that giving aldehydes. From experiments effected by the applicant, it results that, if water is introduced in suitable quantity, the reaction is not only facilitated, as above stated, but, in addition, the reaction giving CO_2, probably by direct oxidation of ethylene according to the equation:

$$C_2H_4+3O_2=2H_2O+2CO_2$$

is checked, owing, as is probable, to the partial pressure of water."

It is further said that the experiments indicate that the side reaction producing CO_2 and water may be completely checked and the efficiency of the reaction producing ethylene oxide increased if CO_2 is previously introduced in addition to the water and the reacting gases.

Three *modi operandi* are next indicated as examples. In the first, compressed ethylene and compressed air are led, with or without hydrogen, into a heated tube contain-

ing the catalyzer, the tube being connected with a circulating pump to supply water under pressure. In the second, the catalyzer is introduced and the tube heated and then "a mixture of ethylene, air, water vapour and hydrogen" is sent through the tube. In the third, the catalyzer is introduced into a high-pressure tube filled with water. Pure ethylene is added "in order that it can dissolve in the water." The tube is heated and "air and hydrogen are slowly introduced."

The specification concludes:

"The experiments . . . have shown that, in presence of the catalyzers indicated, water, in the form of steam or not, considerably promotes the reaction ensuring the production of ethylene oxide."

All of the seven claims include oxygen and water or steam. Claim 1 is typical. It runs:

"A process for the production of ethylene oxide, consisting in subjecting ethylene to the simultaneous action of oxygen and water, in presence of a catalyst [describing the catalyst] at a temperature between 150 and 400° C."

In some of the claims the word "steam" is substituted for "water"; in two, "hydrogen" is added.

Various options or alternatives are mentioned in the specifications, but nowhere in them, or in the claims, is the introduction of water treated as optional or permissive. The District Court made no finding directed to this fact, but the court below definitely holds, and we agree, that, in the process defined in the original patent, the voluntary introduction of water into the reaction chamber is mandatory.

Experiments conducted by the respondent just before it acquired the patent demonstrated that ethylene oxide could be produced by passing ethylene and air over a catalyst at the temperature described in the patent without the voluntary introduction of water. Its patent attorney was asked to study the patent and he concluded that Le-

fort should have obtained far broader claims. He prepared two oaths for execution by Lefort to support the application for reissue.

In the first, it was averred that the specification and claims failed to emphasize the fact that the reaction takes place "whether or not water is present"; and that the attorney in drawing the application had not been adequately instructed that the "fullest benefit and application" of the invention was the production of the oxide in the presence of the catalyst "with or without the inclusion of water in the reaction."

After rejection, the second affidavit was filed. This stated that a certain amount of water was necessarily present in the reaction chamber due to the side reaction which gives CO_2 and water, and that the introduction of additional water and carbon dioxide was merely permissive in order to augment the quantities already formed by that reaction.

Thereupon reissue was granted with a rewritten specification, the seven original claims and two new ones, 8 and 9, which are those in suit.

The substituted specification opens thus:

"This invention provides a specific and novel process for making ethylene oxide. It essentially consists in causing ethylene to combine directly with molecular oxygen at temperatures of about 150° to about 400° C. in the presence of a surface catalyst which favors the oxidation of ethylene to ethylene oxide under these conditions."

The statement is made that ethylene from any source can be used, and that the oxygen can be that of the air.

The only reference to the introduction of water is:

"The oxidation of ethylene takes place with a giving off of heat, and it is, of course, desirable to maintain the temperature of the zone of reaction within the range specified. This can be facilitated by suitable dilution of the reaction

gases, such as that accomplished by the use of air as the source of oxygen, and some water or carbon dioxide in addition to that formed can be admitted to the mixture in the reaction zone if desired. Hydrogen may be similarly added."

The description of the mode of conducting the process differs from all those given in the original specification in omitting the introduction of water.

The specification concludes:

"In any case, the ethylene and oxygen are thus reacted simultaneously at the temperatures set forth in the presence of a surface catalyst and of water . . ."

The new claims 8 and 9 are broader than those of the original patent.[5] It will suffice to quote 8. It is:

"The process of making ethylene oxide by the direct chemical combination of oxygen with ethylene in the proportions of one atom of oxygen to one molecule of ethylene, which comprises forming a mixture containing ethylene and molecular oxygen and conducting said mixture through a confined reaction zone which is maintained at an elevated temperature; controlling said temperature to maintain said mixture in said zone at a temperature between about 150° and about 400° C.; subjecting said mixture in said zone at said elevated controlled temperature to intimate contact with an active surface catalyst" [describing it, *inter alia,* as one which favors the formation of "oxidation products containing ethylene oxide in the presence of water."] and describing other steps not necessary to be recited.

The question is whether, in the light of the disclosures contained in the two patents, they are for the same invention. This court has said that they are if the reissue

[5] This fact, standing alone, does not vitiate the reissue. *Topliff* v. *Topliff,* 145 U. S. 156.

fully describes and claims the very invention intended to be secured by the original patent; [6] if the reissue describes and claims only those things which were embraced in the invention intended to have been secured by the original patent; [7] if the broader claims in the reissue are not merely suggested or indicated in the original specification but constitute parts or portions of the invention which were intended or sought to be covered or secured by the original patent.[8] The required intention does not appear if the additional matter covered by the claims of the reissue is not disclosed in the original patent.[9] If there be failure of disclosure in the original patent of matter claimed in the reissue, it will not aid the patentee that the new matter covered by the reissue was within his knowledge when he applied for his original patent.[10] And it is not enough that an invention might have been claimed in the original patent because it was suggested or indicated in the specification. It must appear from the face of the instrument that what is covered by the reissue was intended to have been covered and secured by the original.[11]

As the Circuit Court of Appeals held, the original specification and claims treated the voluntary introduction of water into the reaction chamber as a necessary step in the

[6] *Powder Co.* v. *Powder Works*, 98 U. S. 126, 138.

[7] *Parker & Whipple Co.* v. *Yale Clock Co.*, 123 U. S. 87, 99; *Hoskin* v. *Fisher*, 125 U. S. 217, 223; *Flower* v. *Detroit*, 127 U. S. 563, 571.

[8] *Corbin Cabinet Lock Co.* v. *Eagle Lock Co.*, 150 U. S. 38, 42.

[9] *Clements* v. *Odorless Excavating Apparatus Co.*, 109 U. S. 641, 647; *Coon* v. *Wilson*, 113 U. S. 268, 277; *Electric Gas-Lighting Co.* v. *Boston Electric Co.*, 139 U. S. 481, 501; *Freeman* v. *Asmus*, 145 U. S. 226, 239; *Olin* v. *Timken*, 155 U. S. 141, 147.

[10] *Powder Co.* v. *Powder Works*, *supra*, p. 138; *Manufacturing Co.* v. *Ladd*, 102 U. S. 408, 413; *Huber* v. *Nelson Mfg. Co.*, 148 U. S. 270.

[11] *Parker & Whipple Co.* v. *Yale Clock Co.*, *supra*; *Flower* v. *Detroit*, *supra*.

process, whereas such introduction is made permissive by the reissue. We agree with that court's view that there is thus a difference between the procedure described in the two documents. But we cannot agree with its conclusion that the difference is so insubstantial as not to invalidate the new claims 8 and 9. On the face of the papers, the process described in the original patent included a step not designated as optional or desirable but described and claimed as an integral part of the whole operation. In contrast, the reissue treats this step as immaterial and mentions the introduction of water as for the mere purpose of controlling the temperature in the reaction zone,—a thought not even suggested by the specification of the original patent, which, on the contrary, in its very first sentence, speaks of the simultaneous action of the oxygen of air and of water.

We think it plain that the reissue omitted a step in the process which was described and claimed as essential in the original patent. The court below was persuaded by expert testimony that, from a chemist's point of view, the prescribed step (the introduction of water) was immaterial; in other words, chemists testified that, by carrying out the procedure, omitting the introduction of water, they obtained the results described in the patent. Naturally enough, this fact led them to state, as chemists, that the introduction of the water was immaterial. Apparently this testimony induced both of the courts below to conclude that Lefort, when he applied for his original patent, knew that the introduction of water was unnecessary. The inquiry at once arises, if this were so, why did he not say so. If he had discovered a process, which the claims of the reissue are certainly broad enough to cover,—that of mixing dry oxygen and ethylene in the presence of a catalyst at the prescribed temperature to produce ethylene oxide,—it is not understood why, throughout his

specifications and claims, he spoke of exposing ethylene to the simultaneous action of oxygen and water or steam.

We think the court below fell into error in adopting the scientific conclusion of expert witnesses that the result would be the same whether water were introduced into the reaction chamber or not, as proof that Lefort's invention was not what he stated it to be in his original patent but rather the invention of a process of bringing ethylene and oxygen into contact in the presence of a catalyst.

Although it is the duty of a court to determine for itself, by examination of the original and the reissue, whether they are for the same invention, it is permissible, and often necessary, to receive expert evidence to ascertain the meaning of a technical or scientific term or term of art so that the court may be aided in understanding not what the instruments mean but what they actually say.[12] It is inadmissible to enlarge the scope of the original patent by recourse to expert testimony to the effect that a process described and claimed in the reissue, different from that described and claimed in the original patent, is, because equally efficacious, in substance that claimed originally.[13] If such testimony could tip the scales on the issue of the validity of a reissue, it would always be possible to substitute any new combination of steps or elements or devices for the one originally described and claimed by proving that the omission of any one or more steps would not alter the result.

This court has uniformly held that the omission from a reissue patent of one of the steps or elements prescribed in the original, thus broadening the claims to cover a new and different combination, renders the reissue void, even though the result attained is the same as that brought about by following the process claimed in the original patent.

[12] *Seymour* v. *Osborne*, 11 Wall. 516, 546.

[13] *Collar Co.* v. *Van Dusen*, 23 Wall. 530, 557.

In *Russell* v. *Dodge,* 93 U. S. 460, the original patent was for treating skins by the use of a compound in which heated fat liquor was expressly stated as an essential ingredient. There was no disclosure that the fat liquor could be used cold. In a reissue the specification was altered by eliminating the requirement that the liquor be heated. The court said:

"The change made in the old specification, by eliminating the necessity of using the fat liquor in a heated condition, and making in the new specification its use in that condition a mere matter of convenience, and the insertion of an independent claim for the use of fat liquor in the treatment of leather generally, operated to enlarge the character and scope of the invention. The evident object of the patentee in seeking a reissue was not to correct any defects in specification or claim, but to change both, and thus obtain, in fact, a patent for a different invention. This result the law, as we have seen, does not permit."

In *Gill* v. *Wells,* 22 Wall. 1, the original patent disclosed and claimed a machine for making hat bodies. One of the elements of the machine was a tunnel through which a current of air was to be passed. The specifications did not indicate that this part could be omitted. The reissue for a machine without any tunnel, was held invalid. The court said (p. 26):

"Argument to show that an invention consisting of a combination of three ingredients which are old is not the same as that of a combination of four old ingredients is quite unnecessary, as the negative of the proposition is as well settled in the patent law as it is in mathematics."

Many other cases might be cited to the same effect.

The court below was persuaded to construe the reissue patent as not differing from the original by the argument that, in both, the introduction of water was not essential to the technological success of the process. When certiorari was applied for in this court, the respondent in its

brief said: "The introduction of water, as distinguished from its presence, in the reaction zone is not 'an essential feature' in the invention at bar, and was not 'described and claimed in the original patent as an essential feature.'"

This argument goes upon the theory that if the presence of water is necessary to the reaction, its presence is assured by the side reaction we have mentioned which produces CO_2 and water. It does not explain, however, why, if this is the source of the necessary water, Lefort did not say so in his original patent. Nor does it suggest how the reaction can be initiated or caused when dry oxygen is used and the side reaction has not commenced.

In the argument on the merits in this court, the respondent shifted its position. In brief and argument it stated that both the original and reissue cover the same invention, for, if both require the introduction of water, the described introduction of air effects also the introduction of water since atmospheric air contains both oxygen and moisture. It is thus sought to avoid the finding of the Circuit Court of Appeals that the original patent called for the voluntary introduction of water and the reissue does not. This argument fails to square with the specification or claims of either the original patent or the reissue. The claims of the original patent are not limited to the oxygen of air; and the specification merely says the oxygen "can be the oxygen of air." The specification and claims of the reissue are satisfied by the introduction of dry oxygen.

In short, to avoid the difficulties which stare one in the face when the attempt is made to read specifications and claims as calling for the same process, the respondent is driven to take inconsistent positions, neither of which comports with the plain language of the two patents.

We hold that the reissue is not for the same invention described and claimed and intended to be secured by the original patent, and is, therefore, void.

The decree is

Reversed.

TULEE *v.* STATE OF WASHINGTON.

APPEAL FROM THE SUPREME COURT OF THE STATE OF WASHINGTON.

No. 318. Argued March 3, 1942.—Decided March 30, 1942.

Under the provision of the treaty of May 29, 1855, with the Yakima Indians, reserving to the members of the tribe the right to take fish "at all usual and accustomed places, in common with the citizens" of Washington Territory, the State of Washington has the power to impose on the Indians equally with others such restrictions of a purely regulatory nature concerning the time and manner of fishing outside the reservation as are necessary for the conservation of fish, but it can not require them to pay license fees that are both regulatory and revenue-producing. P. 685.

7 Wash. 2d 124, 109 P. 2d 280, reversed.

APPEAL from a judgment affirming a conviction of a member of the Yakima Tribe of Indians on a charge of catching salmon with a net without first having obtained a license as required by state law.

Mr. Nathan R. Margold, with whom *Solicitor General Fahy* and *Mr. Kenneth R. L. Simmons* were on the brief, for appellant.

Mr. T. H. Little, Assistant Attorney General of the State of Washington, with whom *Messrs. Smith Troy,* Attorney General, and *E. P. Donnelly* were on the brief, for appellee.