

FRITS RICDOLF CHRISTIANI ET AL PLAINTIFF;

1928

vs.

Dec. 6-8.

JOHN A. RICE DEFENDANT.

1929

Mar. 6.

Patents—Date of invention—Anticipation—Impeachment—Conception of idea

The invention in question herein was for a process of making cellular cement products suitable for building material and containing insulating properties.

Held, That the conception of an idea in some cases may be the merit of an invention, and may not require to be followed by any effort or experimental work of skill; but here the conceiving of the bare idea that voids or cellular spaces would be useful in concrete building materials, would be futile, unless the method or process for doing this successfully in a commercial way was made known. The invention must include and disclose the means of making commercially practical the idea.

- 2. That an antecedent publication ought not to be held to be an anticipation of a subsequent patent, unless it is clear that the antecedent publication discloses a practical mode of producing a result which is of the same effect as that disclosed in the subsequent patent. The mere publication of an idea that a practical article might be made, without sufficient information or means of knowledge communicated to the public, does not prevent a subsequent and independent inventor of those means, from taking out a patent.

ACTION to impeach Canadian Patent No. 252,546, to defendant.

The action was tried before the Honourable Mr. Justice Maclean, President of the Court, at Ottawa.

W. D. Herridge, K.C., for plaintiff.

O. M. Biggar, K.C., and *R. S. Smart, K.C.*, for defendant.

The facts are stated in the reasons for judgment.

THE PRESIDENT, now (March 6, 1929), delivered judgment.

This is an action to avoid Canadian patent no. 252,546, relating to cellular cement products, and the process of making the same. This patent was issued to the defendant Rice, in August 11, 1925, the application for the same having been filed on June 13, 1924. Rice applied for a patent in the United States on December 31, 1922, covering the same subject matter, and later he there received a

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patent therefor. Under the Patent Act, Rice's filing date in the United States is his Convention filing date in Canada.

The ground for this action is, that Rice was not the first and true inventor of the alleged invention mentioned in his Canadian patent here attacked. The plaintiffs claim that the first inventor was one Bayer of Copenhagen, Denmark, the assignor of the plaintiffs, and that Bayer received a patent for such invention in Denmark, upon an application filed on September 11, 1922, issued on June 19, 1923, and published on July 2, 1923. On November 9, 1926, a patent was granted to Bayer in Canada, on an application made in September, 1924. The issue for determination is limited as to who was the first inventor, Bayer or Rice; neither patent is attacked upon any other grounds. Both Bayer and Rice had the same idea in mind, which, each claims, resulted in an invention. Bayer preceded Rice in his conception of his alleged invention and in his experimental work developing the same. However, each was in good faith and they were working independently of each other.

The invention claimed by Bayer and Rice is a process of impregnating cement or a similar material, while in a soft or dry state, with air bubbles produced from a foam which will readily mix with the cement material and occupy space within the same; the purpose and object of this is to produce a cellular product, adaptable for use in building purposes. It is stated that the bubbles displace the cement or other material with which it is mixed, and that a product considerably lighter in weight than that produced in the ordinary way from concrete mixtures is obtained, and further, that the cellular voids improves the heat insulating and sound insulating properties of the finished material. Foam is the aggregate of an indefinite number of small air bubbles which retain their identity because they are surrounded by a film of water, but which ordinarily are not sufficiently elastic to remain so permanently, and therefore other substances are introduced to increase the surface tension around the bubbles, or in other words, to make them more elastic and durable while being mixed with concrete and other material and until its setting. After a time the air is released, and cells or voids are to be found in the cementitious material when set.

The specifications of Bayer are brief and it may be useful to state them in their entirety, particularly as so much turns upon the character of the disclosures made in the specifications of both Bayer and Rice. Bayer states what his invention relates to, and the method of making the same, in the following words:—

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The invention relates to a method of manufacturing porous materials for building purposes, etc., from substances, which set when mixed with water or other fluids, for instance cement and gypsum, and the process consists of adding frothy substances in an indifferent manner during the treatment of the substance with the mixing fluid.

It has turned out that a suitable choice of such substances makes it possible to produce a foam, which during the ensuing shaping of the material is of such a durability that a great number of air bubbles are left in the mass.

The production may take place by adding the foam-developing substance to the setting fluid or to a mixture of same and the material, which is to be mixed with the fluid, thereafter the foam is developed either by stirring up the mass vigorously or by introducing compressed air, possibly carbonic acid. In most cases it will, however, be simplest to add foam already developed to the mixing fluid or to a mixture of same and the setting substance. By production on a large scale the foam may be prepared in a special machine, from which it is carried to a mixing machine of the usual construction, so that the foam is introduced into the mixture instead of or simultaneously with the sand or other expletives.

As foamy substance different kinds of mucilage, for instance the mucilage obtained from seaweed, the so-called tangin, may be used. The durability of the foam obtained from such substances may be increased by adding gelatine. The quantities required of these substances are inconsiderable, and consequently the manufacturing process is very cheap.

In certain cases it has been observed that the durability of the foam is further increased by adding small portions of formaldehyde.

On account of its structure the material produced will be light and heat-proof, and it may at pleasure be manufactured in shaped slabs, which are fastened on with cement or nails, or which are cast on the premises.

Rice, in his specifications, enters into very considerable detail in describing his invention and the process of making it. After stating what his invention relates to, he proceeds to set forth how the principle of his invention may be executed. He states

In the preferred form of my invention, I use a mixture comprising Portland cement, water and gas bubbles. The Portland cement or clay or magnesite or any other equivalent is preferably mixed with sand, either in the presence of water or in a dry state. The gas bubbles are preferably produced by whipping a gelatine mixture, such as a mixture of the following materials, viz:—

1% Glue,

98½% Water,

¼ of 1% Formalin solution containing say about 40% formaldehyde. Before whipping, this mixture is preferably allowed to age for twenty-four hours or longer, and is then whipped into a stiff foam or lather which will

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remain stable for a considerable length of time. It is well known that glue solution can readily be converted into a foam, e.g., by whipping, introduction of air or equivalent methods. The formaldehyde added greatly hardens the films surrounding the individual bubbles, by which the walls of such bubbles become strengthened sufficiently to stand up under the pressure of the cement grout, until the setting of the cement. The ageing also serves to increase the strength and persistency of the foam.

He then goes on to state that this foam is then mixed in suitable proportions with the cement mixture, and this results in the gas bubbles of the foam being thoroughly incorporated in the cement mixtures. where they remain without breaking until the cement is set, thereby producing a stable body with a large number of cellular voids therein. He then proceeds to say:—

In other cases I have found glue solutions of a much lower strength to be very suitable, thus a solution of about one part glue in 100 to 200 parts of water, and containing say 0.1 to 0.2% of the formalin solution, although rather less viscuous than the 5% mixture above referred to, is found to give an excellent foam, which is very stable. I have also used glue mixtures much more concentrated and more viscuous than above stated (e.g., 10% and 15% mixtures) with satisfactory results. I prefer the weaker solutions, because I find (particularly with Portland cement and some of the other hydraulic cements) that the large amounts of glue or other colloids tend to greatly retard the setting of the cement. While such retardation is sometimes useful, it is in other cases rather objectionable.

When using the dilute glue solutions, such as 0.5% it is usually necessary or advisable to give a long and vigorous beating, to give a tenacious and stable foam.

In place of glue, I can use various other colloids, e.g., gelatin, white of egg, or blood albumen (dissolved and preferably formalin added as above indicated) casein (dissolved in borax solution or other alkali). The above substances are all proteid matters, however other substances capable of forming suitable foams are dextrin solutions, starch paste (boiled) Irish moss, agar, soap bark, saponified rosin, cellulose acetate solution, viscose, silicic acid gel (along or with water glass).

Various additions can be made to the glue mixture to increase the foaming properties or to make the foam more stable and more tenacious. Examples of such mixtures follow:

A celluloid, rosin, copal, shellac, rubber, "Bakelite" or similar solution added to the above mentioned glue solution, and the latter then used to make a lather that is entirely proof against water and which has great strength and permanence. Such a foam mixed with Portland Cement mortar, even upon continued stirring, does not show any substantial tendency to break up. As an example of this, I may use to 10 parts of the glue-water-formalin mixture 0.02 parts of a 1% solution of rosin dissolved in acetone.

Of other substances which can be conveniently added to the glue mixtures, for this purpose, I mention soap bark, amole root, Senega root, various "soapweeds," chloroform, phenol, cresol rubber latex, common soap, amonium atearate, saponified beeswax, Japan wax, carnauba wax.

The above mentioned materials can also be used with starch and similar colloids, for forming the foam-producing compound. They can be added to various of the above mentioned colloids, with like results.

Particular mixtures giving very useful results were (a) Irish moss and glue, (b) soap bark and starch, (c) glue and 1 to 5% soap bark solution, (d) glue and 5-10% of chloroform, (e) glue and .05% of phenol or cresol, (f) rubber latex and glue, (g) casein (solution in alkali) and .002 to .005% cresol, (h) ammonium resinate and glue.

Further examples which have been found very suitable are the following:—

- (o) 500 parts by volume of 2% glue solution.
 6000 parts by volume of 2% cold water.
 25 parts by volume of 25% rosin solution in ammonia (about 0.5% solution).
 $\frac{1}{2}$ part by volume of 2% Cresol Compound U.S.P.”

(k) 2,000 parts of 2% glue solution mixed with sufficient saponified rosin and beeswax to represent 1 part rosin and 1 part wax, well mixed and added to 1,800 parts of water. The amounts of rosin and wax can be increased to about 100 parts if desired.

(l) Adding enough dilute acid (HCl or H₂SO₄) to gelatin, solution, give a neutral reaction to the solution, serves to control the size of the bubbles, and when used with Portland cement produces a harder product. Small amounts of alum; aluminum sulfate, aluminum chloride, iron chlorid or sulfate, gives similar effects. (m) 4 parts casein: soak in 12 parts water. Mix 1 part powdered rosin and 18 parts of water, add sufficient ammonia to dissolve. Mix the two solutions. Let stand several hours, when the casein will be thoroughly dissolved, add 7% of a 5% solution of Al₂(SO₄)₃ Stir well. Mix this with 80 volumes of water to produce the foaming solution. (n) Cellulose acetate solution in acetone was added to casein solution and the mixture produced a good foam. Viscose, was similarly used. Rosin soap could be used with both of these, if desired.

Specific formulas for additions to glue solutions which gave satisfactory results are:—

(o) 1 part lysol, 0.3 parts phenol and 0.3 parts of glycerin, added to 0.1 glue solution.

(p) Lysol, Bakelite varnish and formalin, dissolved, in alcohol and added to 20 parts of glue solution.

- (q) 2000 c.c. of 1% glue solution.
 4 c.c. of formalin.
 4 c.c. of liquid phenol.
 8 c.c. of copal solution in alcohol.

(r) 8 casein, 1 rosin and 1 wax (in an alkaline liquid).

The amount of foam to be used with a given amount of plastic cement mixture will depend on the result desired, i.e., the degree of porosity wanted; and the amount of foam that can readily be made to stay in the mortar will depend on the kind of cement and the degree of stiffness of the mortar. I have used successfully, various ratios from one part of bubbles in six or eight of mortar to about five parts of bubbles to one part of neat cement mortar (by volume).

Reverting now to Bayer, what he in substance says is, that if you make a suitable choice of frothy substances it is possible to produce a foam of such durability that a great

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number of air bubbles will be left in the mass during the shaping of the material; that as a foamy substance, different kinds of mucilage, such as mucilage obtained from tangle (sea weed), may be used; that the durability of the foam may be increased by adding gelatine; and that in certain cases the durability of the foam may be further increased by adding small portions of formaldehyde. That sums up Bayer's description of his invention, and the various steps in the process or method of making or compounding his cellular building material. In fact in his specification Bayer says nothing more than I have stated. It is contended that Bayer does not sufficiently describe his invention in his specification and we must now enquire what the law requires in this respect.

The Patent Act, sec. 14 requires that:

14. (1) The specification shall correctly and fully describe the invention and its operation or use as contemplated by the inventor. It shall set forth clearly the various steps in a process, or the method of constructing, making or compounding, a machine, manufacture, or composition of matter. It shall end with a claim or claims stating distinctly the things or combinations which the applicant regards as new and in which he claims an exclusive property and privilege.

The difficult matter for determination here, is, did Bayer in his specifications comply with this statutory requirement. If Bayer had not more exact or detailed knowledge as to the method or process of making porous materials for building purposes, did he make an invention? If he had more specific knowledge and did not give it to the public in his specification, was he entitled to a patent? The duty of an inventor is a positive one, namely, with the fullest bona fides, to describe the best way known to him of carrying out the invention and to leave the public in no doubt as to what constitutes the invention which he claims as his monopoly. He must so draft his specification, that a person having a competent knowledge of the industry concerned, in this case the manufacture of cellular concrete material, will be able readily to ascertain from it the relation the invention bears to the existing knowledge in the industry, and so that one should not be called upon to do experimental work in order to discover how the invention may be made operative. There must be an open exposition by the patentee of everything that is necessary for the easy and certain procurement of the commodity for which the patent was granted. The patentee is not to tell a man

to make an experiment but to tell him how to do the thing. The books contain a wealth of authority supporting this position. All Bayer discloses, it seems to me, is the bare idea that you can make a foam from a mucilaginous substance (which was known), the durability of which may be enhanced by the addition of gelatine and in some cases by the addition of small portions of formaldehyde, and which when mixed with cementitious material will produce a porous building material possessing insulating properties. That seems to me a very meagre amount of information to give the public in the way of showing the steps in the process of making a durable foam that would survive a mixing with cementitious materials, and making ultimately a cellular building material. Would any competent person, after reading this specification and about to test the utility of the invention, feel that he was starting off with the expectation of forthwith making a commercial building material, or, that he was embarking upon an experiment or the beginning of a series of experiments. I think the latter. He would think that it would require more or less experimental work in order to succeed in making a commercial building material of the nature Bayer had in mind, if he succeeded at all. Perhaps many competent persons would fail altogether. Some persons might upon a reading of the specification cast it aside at once, because it was so obviously suggestive of experimental or research work. If Bayer knew more than was expressed in his specification, it should I think have been stated. If he had no more knowledge than the general idea stated in his specification, then I think he had no invention, or had not completed his invention. He might have, for example told the public, when, in his experience formaldehyde might be usefully used, because I infer, he used it in some instances when it did not prove useful. The reference to formaldehyde in the specification is thus expressed: "In some cases it was observed that the durability of the foam is further increased by adding small portions of formaldehyde." This does not convey the impression that the value of formaldehyde had been experimentally established by Bayer. There is some evidence in support of the view that Bayer had not completed his invention before applying for his patent, because the note book containing the results of the labora-

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tory work of himself and his collaborators upon this alleged invention shows, that their work was continued for a month after Bayer filed his application for patent in Denmark. The proportions of materials used in the laboratory work must have been regarded as of importance in establishing the commercial utility of the general idea of making cellular concrete material, otherwise it would not have taken Bayer and his associates nearly two years, during which time a thousand and more experiments were made, to learn that they had definitely made an invention. Did they sometimes find, that a certain proportion of mucilage was unsatisfactory and tended to retard the setting of the cement, or, that a greater or less time of beating was required with some substances in order to obtain a tenacious and stable foam as compared with other substances? I think the specification should have in some degree disclosed the knowledge gained by Bayer from his experimental work, that is, if it was complete and conclusively established. The public should not be expected to travel the long experimental road which Bayer and his assistants had traversed, if Bayer was to be granted a monopoly. The specification as a whole, leaves me with the impression that Bayer's idea or invention was not a completed one, when the Danish specification was prepared.

The conception of an idea may be the whole merit of an invention, and its application when once conceived may require no effort or experimental work of skill. That, I think, is hardly this case. Conceiving the bare idea that voids would be useful in concrete building materials would be futile, unless the method or process for doing this by successful means, in a commercial way, was made known. The idea was valuable, but the invention lay in producing the process or means of making commercially practical that idea.

Defendant's counsel, urged, that the application of Bayer for patent in Denmark, until granted in June, 1923, did not constitute within the spirit of the Patent Act, a knowledge or use, adverse to Rice in his Canadian application. I am uncertain as to whether I properly understand or appreciate this point. Inasmuch as I have expressed the opinion that the sufficiency of the specification of Bayer is inadequate, I think I need not dwell further upon the point. I

might however observe, what in essence I have already stated, that an antecedent publication ought not to be held to be an anticipation of a subsequent patent, unless it is clear that the antecedent publication discloses a practical mode of producing a result which is of the same effect as that disclosed in the subsequent patent. It is necessary, in order that a prior document may invalidate, on the ground of want of novelty, a subsequent patent, that all the essential features of the subsequent patent be found in the prior document. The mere publication of an idea that a practical article might be made, without sufficient information or means of knowledge communicated to the public, does not prevent a subsequent and independent inventor of those means, from taking out a patent.

This case is a very difficult one, and I fully realize the force of the plaintiffs' position so exhaustively and ably presented by their counsel. Briefly expressed, my view is, that any one knowing of Rice could practice his invention. I do not think that is true of Bayer, and there was some evidence to this effect given by one of the defendant's witnesses. If Bayer had actually translated his idea into a workable invention, on the date of his Danish application, then it is a pity he did not make distinct and clear that fact. I do not think that the plaintiffs are now entitled to ask that Canadian patent no. 252,546 be cancelled and set aside, on the ground of want of novelty in Rice, by reason of the prior publication of Bayer. In these circumstances the plaintiffs must be held to fail in their action and I order that the same be dismissed with costs to the defendant.

Judgment accordingly.

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