In the Privy Council.

No. 114 of 1930.

ON APPEAL FROM THE SUPREME COURT OF CANADA.

BETWEEN

JOHN A. RICE - - - - - - - (*Defendant*) *Appellant*

AND

FRITS RICDOLF CHRISTIANI and AAZE NIELSEN, trading under the name, firm and style of CHRISTIANI & NIELSEN, and the said CHRISTIANI & NIELSEN - (*Plaintiffs*) *Respondents.*

RECORD OF PROCEEDINGS.

INDEX OF REFERENCE.

x P 30098 60 11/30 E & S

EXHIBITS.

In the Privy Council.

No. 114 of 1930.

ON APPEAL FROM THE SUPREME COURT OF CANADA.

BETWEEN

JOHN A. RICE - - - - - - - (*Defendant*) *Appellant*

AND

FRITS RICDOLF CHRISTIANI and AAZE NIELSEN, trading under the name, firm and style of CHRISTIANI & NIELSEN, and the said CHRISTIANI & NIELSEN - (*Plaintiffs*) *Respondents.*

RECORD OF PROCEEDINGS.

In the Exchequer Court.

No. 1. Statement of Claim, 8th October 1927.

No. 1.

Statement of Claim.

IN THE EXCHEQUER COURT OF CANADA.

Between

FRITS RICDOLF CHRISTIANI and AAZE NIELSEN, trading under the name, firm and style of Christiani & Nielsen, and the said CHRISTIANI & NIELSEN - - - - - - - *Plaintiffs*

and

JOHN A. RICE - - - - - - - - - - - *Defendant.*

Filed the 8th day of October, A.D. 1927.

1. The Plaintiffs are manufacturers and carry on business in the Municipality of Copenhagen, in the Kingdom of Denmark, under the name, firm and style of Christiani & Nielsen.

2. The Plaintiffs are the owners by assignment of Canadian Letters Patent Number 265,601, to Erik Christian Bayer.

In the Exchequer Court.

No. 1. Statement of Claim, 8th October 1927—*continued.*

3. The Defendant is, as the Plaintiffs believe, a Chemical Engineer and resides at Berkeley, in the County of Alameda, in the State of California, one of the United States of America.

4. Under date of August 11, 1925, there issued to the said John A. Rice, under the Seal of the Patent Office for the Dominion of Canada, a certain Letters Patent Bearing Number 252,546, for an alleged invention for cellular cement products and processes of making same.

The Plaintiffs will, at the trial of this action, crave leave, for greater certainty and particularity, to refer to the said Letters Patent and to the application relating thereto.

5. The Defendant is the owner of the aforesaid Letters Patent.

6. The said Letters Patent is and always has been invalid, null and void and of no effect, for the reasons given in the Particulars of Objection, delivered herewith.

THE PLAINTIFFS THEREFORE CLAIM—

(*a*) A declaration that the said Letters Patent Number 252,546, is and always has been invalid, null and void and of no effect;

(*b*) That it may be adjudged and declared that the said Letters Patent be voided, vacated, cancelled and set aside;

(*c*) Costs of this action;

(*d*) Such further and other relief as the nature of the case may require and the Court may deem just.

(Sgd.) W. D. Herridge,
Of Counsel for the Plaintiff.

I hereby certify that the above document is a true copy of the original filed of record in the Exchequer Court of Canada.

Registrar's Office, Ottawa, October 8th, 1927.

Duncan Clark,
Acting Registrar.

No. 2. Particulars of objection, 8th October 1927.

No. 2.

Particulars of objection.

Filed the 8th day of October, A.D. 1927.

The following are the Particulars of Objection, upon which the Plaintiffs will rely, in addition to any others to which they may be entitled to rely, without delivery of Particulars:

1. The said John A. Rice, mentioned in the Plaintiff's Statement of Claim, was not the true and first inventor of the alleged invention, described and claimed in Patent Number 252,546, referred to in the said Statement of Claim.

2. The subject matter of the said Patent, as described in the Specification and Claims was, prior to the date of the alleged invention

thereof by John A. Rice, invented by Erik Christian Bayer, of the Municipality of Copenhagen, in the Kingdom of Denmark.

3. The alleged invention covered by the said Letters Patent Number 252,546, is not new with the said Defendant; having regard to the invention by Erik Christian Bayer as aforesaid, and to the following Letters Patent:

Denmark—Number 31,916, June 19, 1923, to Erik Christian Bayer;
Canadian—Number 265,601, to Erik Christian Bayer.

No. 2. Particulars of objection, 8th October 1927—*continued.*

4. The allegations contained in the oath forming part of the application for the said Letters Patent Number 252,546, are untrue.

5. The alleged invention covered by the said letters Patent Number 252,546 was not made by the said John A. Rice, the alleged inventor thereof, but was made by the said Erik Christian Bayer.

Delivered by Henderson & Herridge, of the City of Ottawa, in the County of Carleton, Solicitors for the Plaintiffs.

No. 3.

No. 3. Demand for particulars, 27th January 1928.

Demand for particulars.

Required further particulars regarding the matters mentioned in paragraph 4 of the Plaintiff's Particulars of Objections herein, *i.e.*, those respects in which the allegations contained in the oath are untrue.

Dated at Toronto this 27th day of January, 1928.

Osler, Hoskin & Harcourt,
Solicitors for Defendant.

To Messrs. Henderson & Herridge,
Solicitors for Plaintiffs.

No. 4.

No. 4. Further particulars of objection, 30th January 1928.

Further particulars of objection.

Furnished pursuant to the Defendant's demand dated the 27th day of January, 1928:

1. Under paragraph 4 of the Particulars of Objection already delivered —The Plaintiff says that the allegations contained in the oath forming part of the application for the said Letters Patent Number 252,546, are untrue in that the oath states—

(*a*) That the Defendant, John A. Rice, was the inventor of the new and useful improvements forming the subject matter of the said Patent, and

In the Exchequer Court.

No. 4. Further particulars of objection, 30th January 1928—*continued.*

(*b*) That the allegation contained in the said Petition that the subject matter of the said Patent was 'not known or used by others before his invention thereof,' was true and correct.

Delivered this 30th day of January, A.D. 1928, by Henderson and Herridge, of the City of Ottawa, in the County of Carleton, Solicitors for the Plaintiffs.

No. 5. Statement of Defence, 3rd February 1928.

No. 5.

Statement of Defence.

Filed the 3rd day of February, A.D. 1928.

1. The Defendant is ignorant of the facts alleged in paragraphs one and two of the Statement of Claim.

2. The Defendant admits the allegations contained in paragraphs three, four and five of the Statement of Claim.

3. The Defendant denies the allegations contained in paragraph six of the Statement of Claim.

4. The Defendant alleges that the Letters Patent of Invention, bearing No. 252546, and referred to in paragraph four of the Statement of Claim, are and always have been good and valid and of full force and effect, and that he is the true and first inventor of the invention set forth in the said Letters Patent, and that the said invention was proper subject matter for the issue of the said Letters Patent.

The Defendant submits that this action should be dismissed with costs.

(Sgd.) Brittan Osler,
Of Counsel for Defendant.

No. 6. Discussion, 6th December 1928.

No. 6.

Discussion.

IN THE EXCHEQUER COURT OF CANADA.

Between

FRITS RICDOLF CHRISTIANI and AAZE NIELSEN, trading under the name, firm and style of Christiani & Nielsen, and the said CHRISTIANI & NIELSEN - - - - - - - - *Plaintiffs*

and

JOHN A. RICE - - - - - - - - - - - *Defendant.*

Tried before The Honourable Mr. Justice Maclean, at the City of Ottawa, Ont., on Thursday, Friday and Saturday, the 6th, 7th and 8th days of December, A.D. 1928.

Counsel :—

W. D. Herridge, K.C., for the Plaintiff.

Russel S. Smart, K.C., and O. M. Biggar, K.C., for the Defendant.

(Robert Brydie, Sworn as Reporter.)

HIS LORDSHIP : Who appears for the plaintiff ?

Mr. HERRIDGE : I appear for the plaintiff, my lord.

Mr. BIGGAR : I appear for the defendant, my lord, with Mr. Smart.

Mr. HERRIDGE : May it please your lordship, it is to me, my lord, a matter for self congratulation when I realize that I am now bringing before your lordship one of the simplest cases in the history of the Patent Law litigation in this country.

HIS LORDSHIP : It is more interesting to me than to you.

Mr. SMART : My learned friend has his usual optimism with him to-day.

Mr. HERRIDGE : The action, my lord, is nominally an action to impeach the defendant's patent, but really it is an action to determine as between the inventor under the patent owned by the defendant, and the inventor under the patent owned by the plaintiff, as to which of those two was the first inventor of the subject matter common to both patents.

HIS LORDSHIP : That does not sound as interesting as your opening remark.

Mr. HERRIDGE : I cannot promise your lordship a very exciting case, from my point of view. The patent in suit and the patent upon which the plaintiff is attacking the defendant's patent were, as applications, both in the Canadian Patent Office at the same time. The defendant's patent issued, as I understand, through some misunderstanding of the situation; at any rate, it issued. The plaintiff's Patent issued thereafter.

HIS LORDSHIP : Which was the prior application ?

Mr. HERRIDGE : I think the defendant's was the prior application, my lord, although nothing turns on that.

Mr. SMART : The defendant's, my lord.

Mr. HERRIDGE : The point is this, my lord, that the patent having issued beyond the jurisdiction of the Canadian Patent Office, the only method in which to determine this question of priority which now remains is the method which I am now seeking in this action.

HIS LORDSHIP : Well, this is just the ordinary action, the issue being who is the first inventor.

Mr. HERRIDGE : That is all there is to it, my Lord.

The patent in suit, the patent which the plaintiff is attacking, is a patent granted to John A. Rice, who is the defendant in this action, and it is dated the 11th day of August, 1925. The number of this patent is 252546. The patent is for " Cellular Cement Products and Processes of Making Same," and, with your lordship's permission, I shall briefly outline the subject matter of this patent.

The inventor starts out by saying—and I think this is a pretty comprehensive statement of his invention—" The present invention relates to improvements in plastic compositions and its particular object is to

In the Exchequer Court.

No. 6. Discussion, 6th December 1928 —*continued.*

provide a cellular composition or product adapted to be used for walls, constructional purposes, fireproofing of the framework of steel buildings and practically all purposes that concrete can be used for and that is not only considerably lighter in weight than the concrete mixtures now commonly used but it contains a large number of cellular voids adapted to improve the heat insulating and sound insulating properties of the material."

HIS LORDSHIP: What is meant by "cellular"? Air space in the composition?

Mr. HERRIDGE: Bubbles in the composition, or space in the composition.

HIS LORDSHIP: And what is it to be used for?

Mr. HERRIDGE: Well, for all types of buildings, where a lighter material than solid cement is desirable, or where a material with greater insulating properties than solid cement is desirable.

HIS LORDSHIP: Would it be used in stone construction, or applied to walls?

Mr. HERRIDGE: Largely roofs, my lord, and that sort of thing.

HIS LORDSHIP: It would not be useful, would it, in the construction of the walls of a building?

Mr. HERRIDGE: Oh, yes, it is used for that.

HIS LORDSHIP: What value would the cellular composition be in that?

Mr. HERRIDGE: For insulating, my lord. It has a greater insulating property than the solid cement.

HIS LORDSHIP: I can understand that in its application to walls, but in the construction, say, of a stone or brick building it could not be cellular in its composition, could it?

Mr. HERRIDGE: As a matter of fact, we do make certain types of buildings where the requirements for greater insulation are necessary; we do make the walls of buildings, the partitions of buildings, and the roofs of buildings out of what they call a cellular concrete.

HIS LORDSHIP: I can quite understand you making the walls of that, but in cement, stone or brick——

Mr. HERRIDGE: My lord, this is made in various size blocks. What actually happens is that under the invention of Rice he makes a foam, what he calls a tenacious foam, and he makes the foam with a cement, and this mixture is the product for which his patent claims a process, and this mixture is the cellular concrete.

HIS LORDSHIP: I understand now. It is not for cementing stone or brick together, it is interior work.

Mr. HERRIDGE: Yes, it comes in slabs and lengths, but it is made, it is formed, before it is put in place.

HIS LORDSHIP: It is like a great many other insulating materials.

Mr. HERRIDGE: Yes, my lord.

If your lordship pleases, I will just go on with this brief description:

> "The invention embraces especially a method of impregnating cement while in a dry or soft state with gas bubbles preferably produced by whipping a gelatinous substance in the presence of water into a foam or lather, the said material being preferably

rendered tenacious or hardened, as by formaldehyde. The bubbles thus formed mix readily with the cement and occupy space within the same and in this respect may be described as taking the place of gravel or rock now commonly used in the mixing of concrete in addition to sand. My mixture comprises suitable proportions of Portland or other cement, and foam and preferably sand. Of course, gravel may be also added if desired. In referring to cements I wish to state that this expression is intended to include clay, magnesite cement, plaster of paris, keiselguhr and similar cementitious materials."

Then he goes on to say :

" The preferred form in which the principle of my invention may be executed will be described in the following specification but it is to be understood that various changes or modifications may be made within the scope of the annexed claims without departing from the spirit of the invention. 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; "

and then he gives a mixture; he illustrates one way in which this foam of his can be made.

HIS LORDSHIP : What is a gas bubble ?

Mr. HERRIDGE : It is an air bubble. And he says this specific mixture which he suggests in the specification contains 1% glue, 98–4/5% water, and 1/5th of 1% formalin solution, containing say about 40% of formaldehyde.

Then he goes on :

" 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 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 becomes 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.

This foam is then mixed in suitable proportions with the cement mixture."

He has got his foam; he explains how he got it, then he explains how he uses it.

HIS LORDSHIP : It must remain in the bubble state afterwards.

In the Exchequer Court.

No. 6. Discussion, 6th December 1928 —*continued.*

Mr. HERRIDGE: As soon as it has taken form there is an evaporation, and you have the air spaces, and that is what you want:

> "This foam is then mixed in suitable proportions with the cement mixture or with powdered cement material which process results in the gas bubbles of the foam being thoroughly and more or less homogeneously incorporated in the cement mixture. The bubbles remain as such (without bursting) until the cement has set and produced thereby a stable body with a large number of cellular voids therein."

That is why I said it was a very simple matter, my lord.

I will just read one or two of the claims, my lord, to give you an idea of how he forms his invention, and what he conceives his invention to be, and one or two concluding paragraphs of the specification. I think Claim 2 is perhaps the fairest claim to illustrate what I conceive his invention to be:

> "The process of producing a cellular product which consists in mixing a tenacious stable form, with a cement material and allowing the mixture to harden."

Then in Claim 1 he gives what is the result of doing that.

HIS LORDSHIP: What is that, mixing a bubble?

Mr. HERRIDGE: "Which consists in mixing a tenacious stable foam." That is, tenacious possibly made in a thousand different ways, "With a cement material and allowing the mixture to harden." That is what he claims. That is the method he claims, and then he says:

> "1. A shaped product comprising a mixture of cement material and tenacious stable foam."

Then he goes on to give a great many illustrations of the methods and the means and the agencies which may be employed to make a foam which, in his opinion, is adequate for the purpose for which he designs it. I need not bother your lordship with those methods now, because we will deal with them hereafter, and, in my submission, they may be good some of them, and they may be bad some of them, but in the light and knowledge at the time this invention was made they are, in effect, poor samples——

HIS LORDSHIP: You mean, the whole thing could have been stated in one paragraph?

Mr. HERRIDGE: Of course, my lord. I am not concerned to say that they are bad, but I think when I say that they are no good I am speaking in as fair a manner as possible.

He says, my lord, a little further down, after giving these various illustrations of the methods in which this foam can be made:

> "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."

But, as he says, "the amount of foam that can readily be made to stay in the mortar will depend on the kind of cement"; I will repeat again the first two lines of that paragraph:

> "The amount of foam to be used with a given amount of plastic cement mixture will depend on the result desired."

Then he says again—and this is rather interesting:

> "By the use of the limitation 'tenacious and stable' when referring to the foam, I wish it to be understood that the limitation is intended to designate a tenacious foam or such a foam that the thin films forming the bubbles are sufficiently strong to be maintained when mixed with a mortar or cement."

In other words, he says, my idea is to make a porous cement by mixing with the cement in a liquid or dry state a foam, and any foam will do, to use his own words, in which the thin films forming the bubbles are sufficiently strong to be maintained when mixed with a mortar or cement.

Then he says:

> "My invention is applicable to the preparation of any material which hardens or sets on drying; that is to say, a preformed more or less permanent foam may be added to any wet or dry mortar no matter what the binder material therein may be, and no matter what filler materials may be present in the mortar, provided that said mortar hardens or sets on drying. As a matter of fact, the bubbles themselves may be used to replace the large aggregate sometimes used in making concretes of various types; that is to say, I may replace the large aggregate by voids."

And then his concluding paragraph:

> "I have indicated above a number of substances and methods for producing the foam or froth which is to be added to the mortar, but I wish it to be distinctly understood that my invention, in its broad aspects, is not limited thereto, inasmuch as any foam, no matter how made and no matter of what it may consist, falls within the scope of my invention."

That, my lord, in my submission is an important paragraph. It is the governing paragraph in the specifications. I think I am paraphrasing accurately when I say he says, that although I give many methods of making a foam I do not wish to be understood that I am bound to any particular method, and the obvious reason, as I think I will show your lordship without difficulty, why he says that is because he must fully recognize that these various methods of making foam, such as he gives, were all old and in common use, and all known to men skilled in the art at the time he made this invention.

HIS LORDSHIP: The inventor's name is what?

In the Exchequer Court.

No. 6. Discussion, 6th December 1928 —*continued.*

Mr. HERRIDGE: Mr. John A. Rice, I will file, my lord, two pieces of evidence in which this patent of the defendant is sought to be impeached.

Mr. SMART: Are you putting the defendant's patent in?

Mr. HERRIDGE: The defendant's patent is in.

Mr. SMART: I mean, they are filed. Should they not be marked as exhibits at the trial?

Mr. HERRIDGE: I will be very glad to put them in.

Mr. SMART: They are filed but they are not marked as exhibits.

Mr. HERRIDGE: We will put in the Rice patent and mark it as Exhibit 1.

HIS LORDSHIP: Had you not better put in the plaintiff's patent first, Mr. Herridge.

Mr. HERRIDGE: Whichever your lordship pleases.

HIS LORDSHIP: It seems more logical.

Mr. HERRIDGE: I assume, Mr. Smart, this is a copy.

Mr. SMART: I am only taking it from the file.

HIS LORDSHIP: They must be marked now.

Mr. HERRIDGE: I will put in the Rice patent, No. 252546, as Exhibit No. 1, along with Petition and Oath.

Mr. SMART: I should think it would be easier to mark them as two exhibits. There are two separate documents.

HIS LORDSHIP: I think as they were filed as one document it would be simpler to keep them as one document.

Mr. HERRIDGE: Yes, my lord.

EXHIBIT No. 1.—Filed by Mr. Herridge, 6th Dec., 1928: Rice Patent No. 252546, also Petition and Oath.

Mr. HERRIDGE: Then, my lord, there were two patents, a Canadian patent and a Danish patent, cited in the pleadings as evidence going to impeach the defendant's patent, and I shall put in first a copy of the Canadian patent to the assignee of the plaintiff, Erik Christian Bayer, patent No. 265601.

EXHIBIT No. 2.—Filed by Mr. Herridge, 6th Dec., 1928: Canadian patent to Bayer, No. 265601.

Mr. SMART: Have you got a copy of that?

Mr. HERRIDGE: Yes, I will give you a copy.

Then I will put in as Exhibit 3, the Assignment from the inventor—

HIS LORDSHIP: The Assignment from Bayer?

Mr. HERRIDGE: Yes, my lord.

HIS LORDSHIP: Is not the Assignment admitted?

Mr. HERRIDGE: I do not know that it is admitted, my lord.

Mr. SMART: We admit the Assignment.

Mr. HERRIDGE: We will put it in to make the record complete.

HIS LORDSHIP: Why?

Mr. HERRIDGE: To show definitely that the plaintiff bringing this action is a party interested. It is superfluous.

HIS LORDSHIP: Leave it out, Mr. Herridge; that is admitted.

Mr. HERRIDGE: Then I have two more exhibits, my lord. I put in the record file of the Danish patent in application, together with an official translation.

HIS LORDSHIP: I see, it was the Assignment that was recorded here at a date later than the application of the defendant.

Mr. HERRIDGE: Yes, my lord. My point in putting in the Assignment was merely to establish the point that the plaintiff is a party interested.

Mr. SMART: I admit the Assignment.

EXHIBIT No. 3.—Filed by Mr. Herridge, 6th Dec., 1928: Danish Patent.

HIS LORDSHIP: What is the date of that Danish patent?

Mr. HERRIDGE: The Danish patent, my lord, issued on the 19th June, 1923, and issued on an application filed on the 11th September, 1922. That is part of the evidence on which we seek to prove priority of inventorship.

Mr. BIGGAR: I understand the patent has not gone in yet.

Mr. HERRIDGE: The patent is part of the Danish record file. It is included in the record file. That is apparently the way they do it in Denmark.

My other piece of evidence, my lord, which I am putting in now is a copy of the Commission evidence taken in Denmark, at the City of Copenhagen, on the 14th day of August, 1928, and as I have only the one copy I should like to mark the copy which is already on file which was returned to the court.

Mr. BIGGAR: The Commission evidence does not become an exhibit, does it?

Mr. HERRIDGE: I will read it in afterwards. I shall read it into the record now, my lord; it is very brief. I think it is the simplest way of getting it before your lordship, the evidence that was taken in Denmark.

Mr. BIGGAR: My Lord, my friend has put in the Danish patent, and what he describes as an official translation of it. In our view the translation is incorrect. It is not agreed upon.

HIS LORDSHIP: Well, you had better furnish him with your translation and we will see wherein they differ.

Mr. HERRIDGE: I think I should say, my lord, on that point, that anticipating some difficulty, possible or some question as to the exactness of this transaction of this translation and its acceptance, I wrote to my friends on the 28th November, and I said, we enclose our only copy of the record file in the Bayer Danish application; we would suggest that you satisfy yourself as to the fidelity of the translation and then return it to us when we shall be glad to furnish a copy to you. Receiving no reply to that letter I wrote again on December 4th, and asked them if they would reply to that letter. So I really think, my lord, that this objection is ill-timed and improper. I have done all I could do in the matter, my lord.

In the Exchequer Court.

No. 6. Discussion, 6th December 1928 —*continued.*

HIS LORDSHIP : Except you could have produced some expert to prove it. I think we shall wait until we reach that difficulty. There is only one word, you say, that is of importance.

Mr. BIGGAR : Yes, my lord. That word is the word ' tang,' my lord. As a matter of fact ' tang ' in English has a much more specific meaning than it has in Danish. In Danish the word ' tang ' means weed, or sea-weed rather, and the expression in the Danish patent simply means a solution of sea-weed and it is translated as a solution of sea-tang, otherwise known as tangin.

Mr. HERRIDGE : We will accept your interpretation of it.

HIS LORDSHIP : What does " tang " mean in English ?

Mr. BIGGAR : Webster gives it as fucus nodosus—particular kinds of sea-weed. Webster also calls attention to the fact, however, that in Danish it simply means sea-weed generally.

HIS LORDSHIP : We use the word ' tang ' in another sense. We speak of something having a tang.

Mr. BIGGAR : There is no connection with it.

Mr. HERRIDGE : Then, my lord, I will proceed to read this brief evidence taken in Denmark on the date I have given.

Mr. BIGGAR : Shall we correct the exhibit ?

Mr. HERRIDGE : We have no authority to correct an official exhibit.

HIS LORDSHIP : It is on the record. The understanding is that ' tang ' in the official translation means sea-weed.

Mr. HERRIDGE : In our evidence, my lord, we will make that point clear.

I will now read the evidence of the witness Bayer. The questions were asked in the Danish tongue, and were answered, and were then translated, so that that method made for extreme brevity and simplicity of expression. There is an occasional hiatus which can be explained in that way, but I think the reading is quite simple.

Mr. BIGGAR : The witness was examined in the ordinary way in a foreign language through an interpreter.

Mr. HERRIDGE ; I merely state the circumstance under which he was examined. I am not making any apology for the examination :

> " Evidence taken at the City of Copenhagen in the Kingdom of Denmark this fourteenth day of August, A.D., 1928, pursuant to an agreement made by and between the parties hereto, dated at the City of Copenhagen and of even date herewith.
>
> " Appearances : W. D. Herridge, K.C., for the plaintiff.
> Russel S. Smart, K.C., for the defendant.

Witnesses called on behalf of the Plaintiffs, Erik Christian Bayer."

No. 7.

Evidence of E. C. Bayer (on Commission).

MR. BAYER. Examined by MR. HERRIDGE.

Q. Please state your full name, age, residence and occupation?—*A.* Erik Christian Bayer, engineer, inventor, residing at N. Frihavnsgade 21, Copenhagen, born in Copenhagen on the 22nd November, 1875.

Q. What is your occupation at the present time?—*A.* Engineer and inventor.

Q. Engineer and inventor for how many years?—*A.* From 1914.

Q. What inventions have you made?—*A.* I have patented a telephone loud speaker and telegraph apparatus, an electric sound filter, an electric resonant device for location of submarines, a stablized aeroplane ceramic mixture converted into foam substances for concrete ships.

Q. Did any of these inventions go into practical use?—*A.* Yes, the electric sound filter and the device for location submarines have been carried out for the French Government and the invention for light concrete mixtures has been bought by the Codan Wharf at Koge.

Q. Are you the inventor under Canadian Patent No. 265,601, dated the 9th November, 1926? I hand you a copy of the specifications and claims of this patent which I will ask to have marked as Exhibit 1?—*A.* Yes, I am the inventor of this.

Q. Will you state briefly when and under what circumstances you first made invention covered by this Letters Patent?—*A.* From the year 1916, I have occupied myself with light concrete specially for the construction of concrete ships, and I possess a series of patents for the manufacture of light concrete. The idea for the cellular-concrete was conceived by me about New Year 1921, by seeing my wife make a sponge cake, by seeing her mix the whipped white of eggs into the dough. I immediately went into my laboratory and my shaving soap being the most frothy substance I had at hand, I used this to mix up with the cement paste, and it turned out that it immediately gave an excellent result. Later on I experienced with many different frothy substances. I showed the engineer, Mr. Fox Maule, samples produced with soap foam, and these samples were sent to Professor Kreuger in Stockholm, who, however, did not take an interest in these samples. A letter on this subject may be produced.

Q. I hand you original letter dated September 21st, 1921, addressed to you from C. Fox Maule (Exhibit 2). Is this the record to which you refer?

Mr. SMART: The production and filing of this letter as an exhibit is objected to as it purports to state the effect concerned, and the opinion of other party, therefore heresay evidence and in any event cannot be proved by this witness?—*A.* Yes, it is. Thereafter I applied to Professor Jacobsen at the Royal Technical High School with similar samples.

Q. What date?—*A.* About September-October, 1921.

In the Exchequer Court.

Plaintiffs' Evidence.

No. 7. Evidence of E. C. Bayer (on Commission). Examination—*continued.*

Q. What happened when you took these samples to Professor Jacobsen? —*A.* Mr. Jacobsen was inclined to co-operate with me for the development of this matter.

Q. What was the composition of these samples?—*A.* They were made of cement, and as far as I remember, some of them contained sand to which soap foam was added.

Q. What purpose had you in mind in making these experiments and samples?—*A.* To produce a very light and consequently insulating concrete, seeing that the bubbles contained in the mass would produce a highly insulating material that might be used for many purposes for insulation and construction purposes.

Q. What did you do to produce this insulating material?—*A.* I mixed a concrete paste with foam with addition of different quantities of foam and thus obtained different specific gravities of the said concrete. The paste mixed with foam I poured into moulds.

Q. In 1921 what different substances did you use to produce foam?—*A.* First, ordinary soap, different kinds of mucilage, gelatine and gelatine mixed with formaldehyde.

Q. Did you use any other substance?—*A.* I had used some organic substances of which some turned out not favourable for this purpose.

Q. What were some of these organic substances?—*A.* I used fermented solution of sea-tang and a fermented solution of tangin.

Q. To whom did you show this invention besides to Professor Jacobsen? —*A.* To Engineer Philipsen.

Q. When did you show it to Engineer Philipsen, and what did you show?—*A.* Shortly after I had shown it to Mr. Professor Jacobsen.

Q. What date was that?—*A.* It was about September-October, 1921.

Q. What did you show?—*A.* I showed him the same samples as I had shown to Professor Jacobsen.

Q. In 1921 did you discuss your invention or show your samples to anyone outside the two persons already mentioned?—*A.* To Mr. Fox Maule, engineer.

Q. When did you show them to engineer Fox Maule?—*A.* In the first days of September, 1921.

Q. What did you show to Mr. Fox Maule?—*A.* I showed him samples in the form of cubes cast of cell concrete.

Q. What did you do with the Canadian Patent 265,601, which is issued to you?—*A.* I do not know.

Q. Did you assign the Canadian Patent 265,601 and of which this is a copy?—*A.* Yes.

I hand you a copy of an assignment of the above-mentioned patent to Christiani and Nielsen, dated the 7th of September, 1927 (Exhibit 3).

Q. When did you actually sell your invention?—*A.* In the Spring of 1923.

Q. To Christiani and Nielsen?—*A.* To Christiani and Nielsen.

CROSS-EXAMINATION BY MR. SMART.

Q. Christiani and Nielsen are making use of some cell concrete at the present time; is this embodied in the invention you have been describing? —*A.* Yes.

Q. Do they use soap for their production?—*A.* They do.

Q. Can you tell me what percentages of soap you used in mixtures made by you in 1921?—*A.* No.

Q. Can you remember how much formaldehyde there was in the foam in 1921?—*A.* No.

Q. Can you tell how much gelatine you used in the foam produced in 1921?—*A.* No, I do not remember.

No. 8.

Evidence of E. F. Philipsen (on Commission).

Examination of MR. ERIK FRANK PHILIPSEN carried on behalf of the Plaintiff by Mr. HERRIDGE.

Q. What is your full name, age and address?—*A.* My full name is Erik Frank Philipsen. Address: G1, Kongeveg 31, Copenhagen. Age: 36 years. I am Assistant Professor at the Royal Technical High School.

Q. Whom do you assist?—*A.* I am Assistant to Professor Carl Jacobsen.

Q. What is the nature of your work at the University?—*A.* Partly instructive and investigative in mortar, glass and ceramics.

Q. When did you graduate from the Polytechnic High School?—*A.* In 1916–1917.

Q. You have been engaged in engineering work and teaching?—*A.* Since 1920.

Q. What did you do before that time?—*A.* I was a soldier.

Q. What did you do since 1920?—*A.* I was engaged in the above described nature of work.

Q. Do you know Mr. Erik, Char. Bayer?—*A.* I know him quite well.

Q. How long have you known him?—*A.* Since the Autumn of 1921.

Q. Under what circumstances did you meet in 1921?—*A.* I had been introduced to Mr. Bayer by Professor Jacobsen.

Q. What happened at your meeting with Mr. Bayer?—*A.* We talked about the invention which Mr. Bayer had come to show Mr. Jacobsen.

Q. What was this invention?—*A.* It was an invention concerning light insulation, and building materials.

Q. Was anything shown to you?—

(Remark by Mr. Smart: The witness describes something he has not seen.)

In the Exchequer Court.

Plaintiffs' Evidence.

No. 8. E. F. Philipsen (on Commission). Examination—*continued.*

A. There was shown to me some examples of this new material and then I was asked by Professor Jacobsen to help them with the work with this new invention.

Q. What did you do?—*A.* We made many sorts of experiments. We used the material for different kinds of cement, and with different kinds of foam, and tried how much water could be put together with the mixture.

Q. You made these experiments as a result of what Mr. Bayer told you and showed you to do?—*A.* Yes, I did.

Q. Did Mr. Bayer instruct you what to do?—*A.* Partly, but I also made experiments on my own account. I took cement which I mixed with water and then we took the material for the mould, put it into the mortar where it remained until the next day. Then the mortar had set and we took it out of the form and left it till it hardened sufficiently.

Q. What was the product?—*A.* It was what we now call cell concrete.

Q. Who was present when you made it?—*A.* Mr. Bayer and Mr. Jacobsen and some pupils in the laboratory. Later on Engineer Schnadorph was present.

Q. Did Mr. Bayer tell you what to do?—*A.* I made some experiments for him after what Mr. Bayer had told me, but you know that when you make foam with glue and soap and gelatine a.s.o. it can be put together in so many different proportions, that it is not easy to say whether it would not be better to try then the one, then the other proportion, and also two men can sometimes work better together on a problem than one. Besides Mr. Bayer had also other things to make.

Q. The tests you carried out were made under Mr. Bayer's instructions?—*A.* We spoke with each other every day.

Q. Have you any notebooks or other documents showing your work at that time?

Witness produces a notebook, marked as Exhibit 4.

Q. What does this notebook purport to be?—*A.* The commencement of a series of experiments.

Q. Are these the experiments to which you have referred and which were made under Mr. Bayer's instructions at that time?—*A.* Yes.

Q. And when were these tests made?—*A.* They were made on the dates stated in the notebook.

Q. And was Mr. Bayer present when these tests were made?—*A.* Yes.

Q. How do you remember whether Mr. Bayer was present or not?—*A.* Mr. Bayer came daily to the laboratory.

EXHIBIT 4.—Original Note-Book of witness Philipsen to which is attached a certified copy of translation.

Cross-examination.

CROSS-EXAMINATION BY MR. SMART.

Q. Are you prepared to say that the ingredients of the cement and the percentage of these ingredients used now are the same as those first disclosed to you by Mr. Bayer?—*A.* No, it is not the same percentages.

Q. I did not think you meant that it was the same cement or the same ingredients but I understand that what you did say was that the idea was adding foam to the cement to produce a higher porosity?—*A.* Yes.

Q. Referring to these tests, I understand that Mr. Bayer gave you specific instructions as to making out these tests?—*A.* Yes, he did.

Q. I take it that he would not instruct you exactly as to what was to be done in each test?—*A.* No, not with every one.

Q. I understand the situation to be this that Mr. Bayer outlined a specific series of tests or experimental work and you carried them out determining for yourself the exact details of the experiments?—*A.* No.

Q. There were some experiments then which you devised yourself?—*A.* Mr. Bayer told me what to do, but as you know you may always try to make a thing better in working with it and there are innumerable ways of mixing cement, foam and water together.

Q. Referring to these notes, which have been offered in evidence. There is nothing in the notes themselves to indicate whether or not Mr. Bayer was there?—*A.* No.

Q. The notes appear on different pages in the note book and run from December 8, 1921, until October 2nd, 1922?—*A.* We have made many other experiments.

Q. About how many experiments did you make for Mr. Bayer?—*A.* I cannot say, perhaps 1000 to 5000, but I think it was around 1000.

Q. And out of this thousand the notes in this book refer to 19 tests?—*A.* Yes, but we have made a number of other tests and there have been other note books, which have probably later been destroyed.

Q. Is there any record or tests regarding tensile strength or compressions?—*A.* At that time we did not have machinery at the High School for testing such things.

Q. When did you get such a machine?—*A.* I think it was in 1923.

Now I shall ask you to look at these notes with me, as I want to ask you a question or two about these specific experiments.

I am looking first at the note made on December 8, 1921.

Q. What is the word "casein"?—*A.* It is one of the ingredients used.

Q. The sample marked 1 B you indicate is gradually added to this. What does this indicate as to the operation?—*A.* We have worked very much with this sample and have tried it in different ways.

Q. In the sample marked 1 B?—*A.* We have mixed the foam wherein we have put the dry cement and after one hour the sample has shrunk together because the dry cement is absorbing the water from the foam.

Q. In the note of the 11th December, marked 1 C you have used the term "Moler"?—*A.* That is a special sort of Danish clay used for making bricks of a special kind and then afterwards you burn it, and it will have a very light weight about 1 specific gravity.

Q. There is nothing in these notes which you have produced which show how the foam is made?—*A.* No. At the beginning when one is in a

In the Exchequer Court.

Plaintiffs' Evidence.

No. 8. E. F. Philipsen (on Commission). Cross-examination—*continued.*

laboratory and there are no machines different household implements are used.

Q. You have used what was handy to whip up the foam?—*A.* Yes, a cream whipper or anything which was at hand.

It is agreed that a copy of the Danish Patent Application of Mr. Bayer, filed Sept. 11, 1922, certified by the Danish Patent Office may be put in evidence provided a complete record of the file wrapper is produced at the same time.

Counsel for the Plaintiff agrees to produce a certified copy of the file wrapper of the Danish application filed Sept. 11, 1922, saving their right to object to it going into evidence.

No. 9. C. P. W. Jacobsen (on Commission). Examination.

No. 9.

Evidence of C. P. W. Jacobsen (on Commission).

Examination of MR. CARL PETER WILHELM JACOBSEN, late Professor at the Royal Technical High School of Copenhagen. Now: Technical Director at De Forenede Bryggerier. Copenhagen United Breweries.

Q. What is your profession and technical training?—*A.* I graduated from the Royal Technical High School in 1905, with the highest qualifications as chemical engineer, and after two years of practical work I became chief chemist in the Royal Danish Marine from 1907 to 1920. After 1920 to 1928 I have been Professor for applied chemistry at the Royal Technical High School, with specialty mortar, glass and ceramics.

Q. Do you know Mr. Eric Chr. Bayer?—*A.* Yes.

Q. When did you first meet him?—*A.* In 1921.

Q. Under what circumstances did you meet him?—*A.* He had visited me in my home in the latter part of the year, *i.e.*, more correctly between September and the end of the year.

Q. Did you and Mr. Bayer have any discussions and did you make any tests?—*A.* I was interested in his invention of making porous cement by adding foam.

Q. This was what you understood Mr. Bayer's invention to be?—*A.* Yes.

Q. You co-operated under his instructions?—*A.* Yes.

Q. What did you do? Did you carry out any tests of Mr. Bayer's invention?—*A.* Yes.

Q. In the same year?—*A.* Yes.

Q. What was the nature of this test?—*A.* The situation was this, that Mr. Bayer had told me about his idea, that it had, by experience, proved possible to make a porous material, consisting of concrete and made by adding foam to the cement paste.

Q. And at that time you carried out test of Mr. Bayer's ideas?—*A.* When Mr. Bayer had visited me in my house, he made clear to me the leading principle in his idea.

Q. Which was that?—*A.* To add a foam made of frothy substance to the paste of cement.

Q. Did he show you any samples of his invention?—*A.* Yes, he did, which he made himself in his laboratory.

Q. What was the nature of these samples?—*A.* They were light stuff.

Q. What was the size of these samples?—*A.* A few inches.

Q. Was there anything to prevent you making these samples in bigger sizes?—*A.* No, but as a laboratory man, one will always begin to make them in small sizes, then bigger.

Q. Have you any record of the work you did at that time?—*A.* No.

Q. Was Mr. Bayer generally present when these tests were carried out?—*A.* Yes, to begin with, he demonstrated his invention before me, coming to my home and telling me about it. I think he was introduced to me by one of my colleagues, and then he has shown me a sample such as described, and after that, I can say that I was very interested in his invention, because I could see this was quite a new idea invented, and of course, it was an idea that interested me.

Q. Were there any other people who took part in the test of this invention?—*A.* My assistant, Mr. Philipsen, and I think some other who was in my laboratory in those days, I should think a young man, Mr. Schandorph, but I am not quite sure about this.

Q. Did you have any trouble to make this foam?—*A.* Of course, it is easy to make a foam, but in our experiments we have made it better and better.

CROSS-EXAMINATION BY MR. SMART.

Q. You have said you collaborated with Mr. Bayer in the development of his ideas, what was the nature of this collaboration in a general way?—*A.* You see, in such a matter of this kind, there are many different stages, the first stage is to have the idea clear, the idea here is the foam and paste, and after this you have to develop such a thing. It is necessary to try all the different possibilities of variation, and here you have many possibilities.

Q. Did you suggest some?—*A.* Some of course, I was able to give Mr. Bayer a laboratory to work in.

Q. Did you perform the experiment yourself or did Mr. Philipsen do it?—*A.* I should think Mr. Philipsen did 99 per cent. At that time, you see, I have been rather busy, and I should think that my little part of the work has been to speak with the two gentlemen to discuss the matter with them, and to look at the samples after they had been worked out.

Q. How many samples did Mr. Bayer show you the first time at your house?—*A.* Perhaps 1, 2 or 3, I cannot quite remember that.

In the Exchequer Court.

Plaintiffs' Evidence.

No. 10. Aaze Nielsen (on Commission). Examination.

No. 10.

Evidence of Aaze Nielsen (on Commission).

AAZE NIELSEN examined on behalf of the plaintiffs by Mr. HERRIDGE.

Q. Mr. Nielsen, will you state your full name, age and occupation?—*A.* Aage Nielsen, 55 years, occupation, contractor.

Q. You are a member of the firm of Christiani & Nielsen, the plaintiffs in this action?—*A.* Yes.

Q. I hand you a certified copy of an assignment of Canadian patent No. 265,601, dated 9th November, 1926, which assignment is dated 7th December, 1927, which purports to assign the above named patent to Christiani & Nielsen, you are a member of the firm Christiani & Nielsen referred to?—*A.* Yes.

Q. You are the present owner of the patent referred to?—*A.* Yes.

Q. Have you manufactured the invention covered by this patent, which was granted to Erik Christian Bayer?—*A.* Yes.

Q. How long have you manufactured the invention?—*A.* Since 1923.

Q. Have you had a commercial success in the sale of the product covered by the patent?—*A.* Yes.

Q. Have you had much commercial success?—*A.* Yes.

Cross-examination.

CROSS-EXAMINATION BY MR. SMART.

Q. What time in 1923 did you begin?—*A.* In the beginning of June, 1923.

Q. According to what formula did you manufacture the cellular cement, which you say is made under patent?—*A.* The mixture of foam.

Q. What ingredients did you use to produce the foam?—*A.* A sort of soap foam.

Q. Can you tell the ingredients of the soap foam used?—*A.* Cannot give an exact detail. Same as mentioned all the time.

Q. Of course one foam will look very much like another, would it not?—*A.* Yes.

Q. You know if there is anything besides soap used?—*A.* I know something like soap and glue.

Q. You know what kind of soap?—*A.* Cannot tell, am not a soap merchant.

Q. Well, as far as you can go yourself. I will take it all you can say, you are told what you are making is made of soap foam and glue, you cannot say for certain.

Q. Have you any place of business in Canada?—*A.* No.

Q. Have you carried out any business in Canada?—*A.* No.

Q. Have you had some chemists of your own to work on this foam mixture?—*A.* Mr. Bayer worked with this to begin with.

Q. But you have employed chemists?—*A.* Yes, lately, but not the first time.

Q. Looking at your business as a whole, all the enterprises carried out by Christiani & Nielsen, is this cement produce made with foam a large part?—*A.* Yes, it is, and hope to be better.

Q. Can you estimate what part there will be, 10–20 per cent.?—*A.* Cannot tell you exactly, in the beginning there was not very much.

Q. I am only trying to get some idea?—*A.* In developing the business, spent a lot of money on different factory arrangements, nearly up to a 1,000,000.-Krones. (250,000).

Q. When Mr. Bayer came to you first, did he bring some samples to you?—*A.* Yes, some small blocks, 2 or 3 inches square. Cannot remember size.

Q. You have indicated with your hands a size of 3 or 4 inches, ½ dozen samples?—*A.* Cannot remember.

Q. What kind of material did you make use of manufacturing the product?—*A.* Depending on the purpose.

Q. Do you make it in form of building blocks?—*A.* Building blocks and partitions.

Q. What size would the sheets be?—*A.* Any size, what people want, up to 5 feet, for instance. As high as the ceiling of this room, 2 or 3 metres.

Q. Used for flooring or wall?—*A.* Both.

Q. Do you make the foam at your own factory?—*A.* Yes.

Q. Have you special machinery for making the foam?—*A.* Cannot tell exactly.

Q. How soon after June, 1923, did you obtain the machines for making foam?—*A.* When Mr. Bayer came to us, he demonstrated a machine to us.

Q. When was your first job carried out?—*A.* The first job was carried out late in the year of 1923.

Q. I suppose between June and the end of the year was spent in developing the commercial machinery?—*A.* Yes.

Mr. HERRIDGE: That is the end of the Commission evidence taken in Denmark.

HIS LORDSHIP: Why did not this witness know how the foam was made? I do not know that it is important.

Mr. HERRIDGE: He was a business manager, my lord, and he was not concerned with the details of manufacture.

HIS LORDSHIP: I see. You say someone in the business did.

Mr. HERRIDGE: Oh, yes, everybody did. Nothing turns on that. He was one of the partners, and, of course, the chemical details, the manufacture of the stuff, was assigned to someone else, his engineers and the factory people.

HIS LORDSHIP: How is this made in practice, in vats?

Mr. HERRIDGE: Yes, it is made in vats, my lord. I do not want to anticipate what my witnesses will say. Of course, as your Lordship understands, the idea of making foam is about as old as anything in the world. The idea of making foam, upon which nothing turns, in large quantities,

In the Exchequer Court.

Plaintiffs' Evidence.

No. 10. Aaze Nielsen (on Commission). Cross-examination—*continued.*

was suggested by Bayer in his specification, and we will tell all about that. Nothing turns on the employment of the vats, or the making of foam in the vats.

HIS LORDSHIP: I wonder if "cementitious" is a proper English word?

Mr. HERRIDGE: The lingo of the Patent Office is almost as alarming as the language of the Stock Exchange.

No. 11. Alexander E. MacRae. Examination.

No. 11.

Evidence of Alexander E. MacRae.

ALEXANDER E. MACRAE, sworn. Examined by Mr. HERRIDGE.

Q. What is your full name?—*A.* Alexander E. MacRae, forty years of age.

Q. Occupation?—*A.* I am a chemical engineer and Patent Solicitor.

Q. Residing at the City of Ottawa?—*A.* At the City of Ottawa.

Q. And state your qualifications, Mr. MacRae, to give evidence in an action of this nature.—*A.* I am a graduate Chemical Engineer, and a registered professional engineer of the Province of Ontario. I have been engaged in patent work, as Examiner in the Patent Office, and in the preparation and generally dealing with patents and applications since 1914. My activities have not been confined to chemical patents, but to all branches of work which has come within my direction. That has been quite varied.

Q. And you have had some special experience with this type of invention?—*A.* For two or three years I have done a very great deal of work in connection with inventions concerning the manufacture of porous insulating building materials made from cementitious matters, such as gypsum, gypsum in particular, and I know from my own practical experience with these materials just how such porous materials are made today in Canada in very substantial quantities.

I have also made tests myself in connection with the production of foam for use in this way, and I have myself incorporated a pre-made foam in gypsum. I have also made experiments, in which I developed the foam directly in the slurry of gypsum. Slurry of gypsum means gypsum to which water of hydration has been added, the mere reduction to public use in connection with ordinary cement, and it means cement containing sufficient water to hydrate it so that it will set. The later experiments which I made were made because in the disclosure of the Danish patent application, Exhibit 3, the patentee there, Bayer, states that the foam may be a pre-made foam, or it may be a foam which is developed directly in the mixture of the cementitious material and water, or, as he defines it in the application, the mixing fluid. The term "mixing fluid" as he uses it, includes the

water for hydration purposes as well as the bubble-forming agent, or froth-producing substances which he must use in order to cause the water to retain the air which he whips into it.

Q. Have you a copy of the Danish patent application before you?—*A.* I have.

Q. And, of course, you have read it?—*A.* I have.

Q. Perhaps you will continue to just tell His Lordship what that Danish patent means to you; what is your understanding of its disclosure.

Mr. BIGGAR: Is my friend suggesting that the witness should interpret the technical terms in the patent, or read the English. If it is just reading the English I do not suppose it is admissible.

Mr. HERRIDGE: What I propose the witness should tell His Lordship is what he understands the patent to mean. I think that is a perfectly plain question.

HIS LORDSHIP: I suppose I have got to determine that.

Mr. HERRIDGE: What I want to enlighten your Lordship on is what this disclosure in the patent means to him.

HIS LORDSHIP: What does the patent say as to how this material is made?

Mr. HERRIDGE: That is what he is going to tell your Lordship, and that is what I intended him to tell you by my question.

HIS LORDSHIP: I suppose this could all be put very briefly. How is the material described in this patent made?

WITNESS: The process described in the patent consists in making a porous building material by the use of any cementitious material, and the document particularly mentions cement and gypsum, by developing directly in the cement or gypsum, what water which must be added to cause to set a foam, or by adding to the cement or gypsum, and the water necessary to hydrate it, a pre-made foam. That is, a foam which would be made in a machine by itself, and the foam carted or carried from that machine and mixed in a mixture with the gypsum or cement and water required for causing it to set. He specifically disclosed six different ways of making it, and it is rather interesting to note——

Q. There is a difference between foam and bubbles, is there not?—*A.* My lord, a foam consists of a great number of bubbles.

Q. Millions of bubbles?—*A.* The size of the bubbles largely determines the density or the stability of the foam. By that I mean that if you reduce the size of the bubbles considerably by beating it up a little more, beating it as one does cream, or the white of an egg, the bubbles are reduced in size so that they become very much more stable.

Q. That is, the more you beat them the smaller they become and more tenacious?—*A.* Yes, sir.

Q. What happens then when they are mixed say with cement and water; will they retain their form?—*A.* Yes, sir. When the foam is mixed with cement slurry or gypsum slurry they will remain as bubbles. Some of them will break up; if the foam is not fairly stable some will break up. The number that break up depends upon the ability of the film, which

In the Exchequer Court.

Plaintiffs' Evidence.

No. 11. Alexander E. MacRae. Examination—*continued.*

consists of air and forms the bubble, to resist the action, or the tendency of the mechanical operation to rupture that film.

Q. Is there any way of telling, when you have completed a given material, as to whether or not those cells are existing in the material?—*A.* Yes, indeed.

Q. What particularly?—*A.* You can look at the samples made and see them.

Q. Well, but supposing you had a piece of board say 20 inches long by 10 inches, by what means could you tell whether the cells were evenly distributed throughout, and in the required number, to make it a proper insulating material, and supposing it was three inches thick, or four inches, or something like that?—*A.* To tell if they were, you would have to do that by examination, and by the weight of the material. To get that sort of material, the thing you would have to do would be to use a sufficient amount of foam to give the weight which you require in the material.

Q. You can test it by weight?—*A.* Oh, yes.

Q. As well as by practical examination of the material?—*A.* Yes. It would depend on all these factors. If you wanted to make a board that would weigh, let us say, 3000 pounds per thousand square feet of board, you would use a certain pre-determined percentage of foam in your mixture of gypsum or cement.

Q. You could work it out mathematically?—*A.* Quite so, in order to be sure of getting all that percentage in a usable form, that is, so that a number of the bubbles would not be ruptured before it was actually set in the material and air lost, the foam that you used would have to be sufficiently stable to enable you to get it all in.

Now, if the particular foam one is using, is, for commercial reasons, not sufficiently durable that some of it will not break up, well, he will take care of that by adding 5 per cent. more foam than the real amount he wanted.

Q. In actual practice, is the foam pre-made, or is it usually made in mixing the water and the cement?—*A.* The cases where I have seen it in practical commercial use now it is pre-made. It can be made the other way. I have made it myself in a small way, of course, and I could make it here in a very few minutes and show you samples, if they had time to set, which would exceed the porosity, without requiring any skill whatever on the part of myself. The surprising thing in this idea of Bayer's is, that if you take these common, well-known things, such as bubbles, which everyone has known for years, and mix them with an angular substance such as cement is——

Q. Angular?—*A.* Angular, having rough edges. The first effect one would have would be, well, those edges rupture so quickly that the air will all get away, but his suggestion is to take this foam, mix it, and you will get a porous building material which will be very useful for insulating purposes.

Q. Would it be more successful when mixed with a sharp-edged material, and circular, round?—*A.* No, merely from this point of view, it would not

make a bit of difference, none whatever. The only object is to get cells in the——

Q. That is the whole invention; you could stop right there and say you have said everything that is worth while?—*A.* Yes, my lord. One could stop there, and a schoolboy could carry out the novel process disclosed and make the product.

Q. What about the preparation of the mixture; what does the inventor say about that?—*A.* He says nothing about that, except that——

Mr. HERRIDGE: And why?—*A.* Obviously, why the greater the porosity required in the finished material the more foam you must use in order to get the greater number of cells.

HIS LORDSHIP: So, in your opinion, his claim to invention was the principle, the process of using these air cells in building material?—*A.* Yes, sir.

Q. And that would vary according to the thing you wanted, and, therefore, could not be stated in definite terms?—*A.* Yes, my lord.

HIS LORDSHIP: I see your point.

Mr. HERRIDGE: Will you continue your discussion of that patent now?—*A.* In addition to that Bayer, in this original document, after disclosing different ways in which he might get the bubbles in the slurry, by mixing them directly or adding them pre-made, and he says, either by whipping them up, or he might inject air or a gas into this slurry containing the bubble-forming agent, so as to occlude the air. He simply means to take in air, hold the air films within the film. He can make it that way.

HIS LORDSHIP: State that again. I am not quite sure that I follow you. Is it an illustration?—*A.* Yes, my lord. I think if I read what is stated there, it is so simple and plain.

Q. Read it first, then.—*A.* "The production may take place by adding the foam-developing substance," that is, the froth, the thing that he must add to his water to make it retain the air sufficiently, "the foam developing substances to the setting fluid or to a mixture of same and the material, . . ." Now, "setting fluid" obviously means water. He might possibly use some other setting fluid to cause cement or gypsum to set, but that is what he calls it, "setting fluid." "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." CO2. "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."

HIS LORDSHIP: That is, you can put it in the water first, or you can mix your cement and water and then add to that?—*A.* Exactly, sir. I have myself done them both ways, in that way mentioned, and in each case the product produced was full of cells. The number of cells varied in some cases depending on the amount of agitation, the extent to which the bubbles were sub-divided, and the amount added. "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."

Q. What sort of machine would be required to produce this, a pipe, or revolving wheel, or what?—*A.* What I used, my lord, was just a small dish in which I put the water and a little of the bubble-forming agent, and I took an egg beater and beat it up the same as you would an egg.

Q. But the patentee there is discussing mass production. He would not do it with an egg beater in that case?—*A.* You could do it in one of two ways, by a machine having sufficient agitating capacity.

Q. Something on the same principle as the egg beater?—*A.* Yes, or a more simple way, my lord, would be to have your solution containing the bubble-forming agent, and do as Bayer suggests, blow air into it so as to cause the air blown in to be held in the solution by the bubble-forming agent, and the foam would rise on the top.

Q. This foam would look just like an ordinary soap foam, or sea foam? —*A.* Yes. You cut down the bubbles by agitation, you reduce their size. Large bubbles, for example, on the top of the water level, then the agitating arms would rotate about within that foam to cut the bubbles into smaller particles, to make the foam more tenacious, sufficiently tenacious so that it will roll nicely out of that machine, and as it is used, where I have seen it used commercially, the foam runs on to a belt which carries the slurry off the gypsum, and the foam drops right on to the belt, and then goes into a mixer which works the foam with the slurry.

Q. You mean, the cement would drop off the belt?—*A.* Yes, my lord. At one point the cement slurry would drop on the belt, and then as the belt travels along a few feet the pre-made foam is dropped on top of the slurry on the belt, and that carries it to a mixer which uniformly mixes the foam with the slurry, and from that mixer it goes into the moulds where blocks are formed, or board, depending on which material you want.

Q. The patentee does not describe any particular machinery?—*A.* None at all.

HIS LORDSHIP: Is there anything else?

Mr. HERRIDGE: Does Bayer, in his patent, illustrate any of the common means of making pre-made foam?—*A.* Yes. He says: "As foamy substance different kinds of mucilage may be used." And as an example of what he means by mucilage, he refers to that mucilaginous extract obtained from sea-tang, the so-called tangin. I should like to make very clear that point, since it has been read. You refer to a document or two which are very interesting, and which will make that point very clear.

HIS LORDSHIP: Do you agree that it is the same as sea-weed?—*A.* Undoubtedly, my lord, there is no question. But sea tangin, however, is not sea-weed, and it is not intended to define sea-weed. Tangin is the extract from the sea-weed.

Mr. HERRIDGE: Have you anything to substantiate that?—*A.* I have. I would like, first, to refer to this patent of one Stanford.

Mr. BIGGAR: We have had no notice of this, my lord.

HIS LORDSHIP: He is not introducing the patent as a patent. I think he is making clear this word. It cannot do any harm.

Mr. BIGGAR: Well, my lord, we have not got this patentee here to cross-examine. We have not had any notice of the patent.

HIS LORDSHIP: I do not see much in the objection, Mr. Biggar. I think probably there is no necessity of going further. I mean, if you are both agreed that the word in the patent means sea-weed, but if it makes it clear to me I would like to hear it. You are not putting in the patent?

Mr. HERRIDGE: No, my lord.

HIS LORDSHIP: You are referring to this patent and selecting a word from it which will assist in the explanation.

Mr. HERRIDGE: Just to show the knowledge in the art at the time this invention was made.

Mr. BIGGAR: Is your Lordship ruling generally that a party can produce and refer to patents of which no notice has been given to the other side?

HIS LORDSHIP: No.

Mr. BIGGAR: Because I do not know what is in this patent, that we have been given no notice of it, have been given no notice that any reference would be made to it.

HIS LORDSHIP: I will say this, Mr. Biggar, that nothing produced from this patent will be harmful to you, because I am not admitting anything within the patent as evidence. I understand Mr. MacRae is going to refer to this, as he would to a book, to get some light on a particular word, but the patent, as a patent, being introduced could not possibly do you any harm.

Mr. BIGGAR: Of course, my lord, it is perfectly open to the witness to refer to a book to prove the common knowledge of the art, but it is not open to him to refer to a patent to prove that.

HIS LORDSHIP: My understanding is that he is not going to prove the art from this patent.

Mr. BIGGAR: That is what he said. That is what my friend just said.

HIS LORDSHIP: Yes, Mr. Herridge did, but I was not listening to that. I think he went too far there. I think he went further than the witness was intending to go.

Mr. BIGGAR: I only know that the witness is going to refer to a patent.

Mr. HERRIDGE: If your Lordship would hear the witness I think perhaps that is the easiest way out of this difficulty.

HIS LORDSHIP: I just want a little information about that word. I do not want you to tell me what is in this patent at all.

WITNESS: The application which I have read referred to mucilage, and gives an example of mucilage which he says is extracted from sea tang, and he calls it tangin. I wish to refer to this document in this hand, which is dated 1886, to illustrate to your Lordship what I conceive this language used by this man meant, and in this patent there is disclosed—this document, we need not call it a patent—a process for extracting useful substances from sea-weed, and it says particularly that variety of sea-weed known as laminaria, just a variety of sea-weed. These words are used in the

In the Exchequer Court.

Plaintiffs' Evidence.

No. 11. Alexander E. MacRae. Examination—*continued.*

document. He says, a glutinous or mucilaginous solution is formed from these. It is well known that that is what these things are, these extracts, and he refers here to the uses of these products, as extracted from sea-weed, as being there used instead of glue—as a substitute for gums or glue, or other ingredients for plastic purposes.

Q. I do not see that that helps us so very much. You agree, at least, that sea-weed is the equivalent of tangin, as understood by counsel?—*A.* No, my lord, I would not agree to that. Sea-weed and sea tangin I take to mean the same thing. There is an interesting point, my lord, I do not know that it makes any difference at the moment. It is an interesting point that I wish to refer to, and I do not see that any objection can be taken to it anyway. Tangin is a substance which a Norwegian chemist or engineer—I do not know what he was—used to define an extract which he took from sea-weed. The word "tangin," which I cannot find in any chemical book that I have referred to, is a new term to me, and as this document I think clearly indicates, it was a term used by this man himself to name the extract which he took from sea-weed.

Q. So it is an extract from sea-weed, and what quality does it possess which the inventor required here?—*A.* It is a mucilaginous or glutinous material.

Q. A glutinous material?—*A.* Yes.

Q. That is why he took it?—*A.* Exactly, my lord, and that is why I conceive Bayer referred to it. Denmark has much sea-weed about its coast, and I suppose that was one of the most common ways of getting a mucilaginous material known to him.

Q. Well, there is no dispute about it?—*A.* May I say this, my lord, because I think it is interesting. A weekly bulletin of the Department of Trade and Commerce, published in August, 1916, refers to this work of this Norwegian chap I speak of, and it tells about this substance which he called tangin, and stated that at the time, in 1897, he had a small factory at Christiania for extracting this substance, and he had made a building solution from this sea-weed extract which he called tangin.

Mr. HERRIDGE: Now, Mr. MacRae, you have spoken once or twice about having conducted practical experiments under the Bayer patent. Will you tell His Lordship briefly what you did, and what results you arrived at, in as simple and brief a way as possible.

HIS LORDSHIP: Is that in controversy, or do you admit the Bayer patent will make the material?—*A.* I made the experiments, which I conducted exactly as set forth in this Danish application for patent of Bayer, without any variation at all.

Q. Your patents are being used in Canada today? This material is made in half a dozen places in Canada?—*A.* I only know of one place where it is being made in Canada.

Q. What is the one place?—*A.* It is being used for making gypsum wall boards.

Q. Where? At what place?—*A.* In Ontario.

Q. I thought there were at least a dozen places?—*A.* Well, by one company. The Canada Gypsum & Alabastine Company use a pre-made foam for the manufacture of wall-board and building blocks, both of which are made porous by the use of this pre-made foam.

Q. There is a place at Saint John, New Brunswick, where they make it? —*A.* It has long been known to make a porous material by chemically releasing the gas in the slurry, and in those cases the person who so made a porous material used a bubble-forming agency of glutinous material, or a mucilaginous substance, to cover the gas bubbles released chemically, to be retained within the slurry.

Q. How do they make the cells in insulating material that is made from vegetable matter, such as grass or corn or wheat?—*A.* The vegetable material itself has, as I understand it, cellular qualities, and when the fibrous material is placed together it is just held more or less loosely, so that there are many cells, or air spaces, within the material.

Q. Now answer Mr. Herridge's question, Mr. MacRae, very briefly? *A.* As stated, I followed the specific instructions disclosed, given in the Danish application. The apparatus I used was merely a dish and an egg beater. I can show you the particular egg beater which I used. I have it here. I used it in the several different ways which he discloses, using a saponin solution.

Mr. HERRIDGE: What is that?—*A.* Saponin is a mucilaginous material, and, to give an accurate definition of it I might read this taken from a simple little encyclopedia of Nelson's.

Mr. HERRIDGE: I think they will admit the definition.

Mr. BIGGAR: As a matter of fact, unless the witness is qualified to give expert evidence then he ought not to be giving it.

HIS LORDSHIP: I think the witness is quite right?—*A.* Saponin, the vegetable member contained in the common soap wort; quillai bark; horse chestnut, etc. In other words, it is a vegetable extract which is a mucilaginous substance which has flexibility when used.

Q. Well, you used it anyway?—*A.* I used it. It is a common thing.

Q. Where do you get it?—*A.* Buy it on the market anywhere.

Mr. HERRIDGE: We have, my lord, two or three samples that are rather interesting.

Q. Why did you use this saponin?—*A.* Because it was the most readily available thing that I knew of, and I knew that it was quite capable of retaining these bubbles.

Q. You knew of it apart from the Bayer specification?—*A.* Yes, I did.

Q. If you had not known of it, apart from the Bayer specification, is there anything in the Bayer specification to suggest it?—*A.* Yes, I would have used a mucilage, as stated in the Bayer specification. I would not necessarily use a mucilage derived from sea tang. I knew that mucilages could be derived from sea-weed, but I would take any mucilage which I would get available, any mucilage derived from sea-weed. It might be tangin.

Q. Or a dozen others?—*A.* Yes. Mucilage is a term which denotes any viscid or glutinous mixture of water and a vegetable extract.

Q. Then when you took the patent, Mr. MacRae, what did you do in those experiments?—*A.* In the one group of experiments I beat the solution up to form the foam by itself, and with the cement mixed with it, and poured the mixture into a mould where it was allowed to set. After the material hardened I broke the samples in two, so as to examine its porosity, and it was quite evident in each case that there was a very pronounced retention of air in the material.

Q. So that you got a real porous cement material?—*A.* Quite, a real product. The other group of experiments were made by blowing air into the water containing the bubble-forming agent, and the water-bubble-forming agent and cement. I just used an ordinary pump to force the air in, and I did use rather fine streams. I put a little bladder on the end of the nozzle from the pump and punctured that with holes so that the air came out of the bubbles in fine streams and up into the mixture.

His Lordship: Did you apply this glutinous material, mucilage, to the water first?—*A.* Yes, sir, and to the mixture of the cement and water. It was necessary to do that in order to retain the air. In addition to that, using saponin, I tried the same experiment with soap, ordinary laundry soap which I could buy and beat up into a foam, and I also tried glue.

Mr. Herridge: And what results did you get from that?—*A.* As a matter of fact, I did not succeed in getting the foam which I made from glue into a cement product, because the foam which developed broke up so quickly after I made it that I did not succeed in getting it into the cement. The bubbles were not durable enough, and that was probably due to the type of glue I used. I do not know.

Q. What sort of glue did you use?—*A.* Just the ordinary glue which I bought on the street, LePage's glue. It is a fish glue, I think.

His Lordship: It used to be a fish glue?—*A.* It is not a vegetable extract, I know that. Then I added formaldehyde to it, and that did seem to strengthen the bubbles some, but not sufficient with a one per cent. glue solution to enable me to mix the foam with anything else. When I tried a larger percentage of glue I got a better foam.

Mr. Herridge: Did you get a satisfactory result?—*A.* No, I did not with any experiment I made with glue; I did not get such a foam as I could mix in with the cement. Now, that may be due—I think it is due to the glue I used. I feel quite satisfied, although I have not made the experiment, that there are glues which will certainly enable one to make a foam quite good enough for this purpose.

Mr. Herridge: Mr. MacRae, in regard to the experiment made with the soap, how did that turn out?—*A.* Splendidly. As a matter of fact, that was the best foam I made, with the ordinary soap. It stood up for a long time.

Q. The soap bubbles produced were durable only for the purpose for which they were intended, namely, to be incorporated in this cement slurry?—*A.* Yes, and they would stand up as long as I was working at the

experiment. The durability of the foam, I noticed very particularly, was affected by the amount of agitation, and the extent to which the bubbles were subdivided.

Q. What do you mean by that exactly?—*A.* The size of the bubbles were reduced so that the bubbles would not break down as readily as when they were larger.

Q. So that the durability of the foam depends, in a measure, on the character of whipping it gets?—*A.* And size of the bubbles.

Q. Which can be determined?—*A.* By the extent to which agitation is carried out.

HIS LORDSHIP: You stated that already.

Mr. HERRIDGE: Now, Mr. MacRae, in those experiments which you have referred to, and which you say were based on this Bayer disclosure, were you in any difficulty in carrying them out because of the suggested scarcity of bubble in the Bayer disclosure?—*A.* None whatever.

Q. And why do you say that the Bayer disclosure contains adequate instructions to enable these experiments to be done?

Mr. BIGGAR: He has not said that.

HIS LORDSHIP: He has said so inasmuch as he did it himself.

WITNESS: The disclosure clearly discloses enough to enable anyone to carry out the process there described.

HIS LORDSHIP: I understand you, Mr. MacRae, to say that everything about this is simple?—*A.* Extremely simple.

HIS LORDSHIP: And while it is not his function to determine wherein lies the invention, apparently if he were allowed to decide the case it would be well fixed, at least in the application of cells to a cementitious material——

Mr. HERRIDGE: That is what the witness is going to tell you, and that is the plaintiff's case.

HIS LORDSHIP: I do not see that there is anything more we want from Mr. MacRae on that point.

Mr. HERRIDGE: I think, my lord, he has given it to you very fully.

Q. Now, Mr. MacRae, did you attempt to make a foam from this specific illustration given by Bayer, sea-tang or tangin?—*A.* No. I did use a mucilage. The mucilage I used might have been derived from sea-weed. I do not know.

Q. Why did you not attempt to make it?—*A.* Because I just did not go to the trouble of finding out whether the particular mucilage I used was made from sea-weed or not. I merely used a mucilage which he discloses and tells one to use, and in addition to that I used the other thing, which seemed to me to be the most obvious thing to use.

HIS LORDSHIP: I suppose Le Page's glue used to be made from fish waste; I suppose the fish fed on kelp and sea-weed?—*A.* As a matter of fact, the reason why I used saponin was that it was disclosed—I had previously seen it disclosed in an old patent issued to one Sanford, back in 1876, I think it was; at a very early date. He was disclosing there, and claiming, a process of making porous building material by the development of bubbles

In the Exchequer Court.

Plaintiffs' Evidence.

No. 11. Alexander E. MacRae. Examination—*continued.*

directly in the mixture, and there he disclosed and said that you had to use a glutinous or mucilaginous substance.

HIS LORDSHIP: Mr. Herridge, Mr. MacRae did not use this tangin, anyway.

Mr. HERRIDGE: No, my lord, but in the States they did and proved the process workable.

Q. As a matter of fact, Mr. MacRae, at the time this invention was made the art of bubble making was very old ?—*A.* Yes.

Q. I suppose there are, in literature, a good many standard books which give, while not entirely instructive, at least practical details on that point ?— *A.* Yes, here is one sample, a little book which I found in the Ottawa Public Library on soap bubbles, and to one who is interested in the scientific point of it, it is intensely interesting. It was published by C. V. Boys.

HIS LORDSHIP: Is it a scientific book ?—*A.* Yes, it is.

Q. Never mind going into the book. You leave that here for me.— *A.* It is a book I borrowed from the Library.

HIS LORDSHIP: I might like to have reference to it.

Mr. HERRIDGE: Could we just read this one paragraph, my lord ?

WITNESS: Speaking about the soap bubbles: Reads from pages 103 and 115.

> "It can only be our familiarity with soap bubbles from our earliest recollections, causing us to accept their existence as a matter of course, that prevents most of us from being seriously puzzled as to why they can be blown at all."
>
> "While a solution of soap in soft water or water and glycerine is the most perfect material known for blowing bubbles, perfect by reason both of the ease with which it may be obtained and of its transparency and fluidity, yet some other materials allow of bubbles being blown. The best-known of these is melted resin to which should be added a small proportion, say one-tenth or one-twentieth, of beeswax or of gutta-percha or a smaller proportion of linseed oil."
>
> "Surprising and ludicrous bubbles may be blown with a solution of saponine. Saponine may be bought as a white powder and very little dissolved in water will give the required mixture. A sufficiently good solution may be obtained by cutting up horse chestnuts in thin slices and soaking them in very little water. The slightly yellow liquid, which contains other things as well, contains enough saponine to enable bubbles up to three or four inches in diameter to be blown."
>
> "I have found that the saponine-solution is quite admirable in the froth apparatus (Fig. 52). For this purpose a solution of saponine in 1,000 times its weight of water does very well."
>
> "Saponine present even in very small quantity will make water froth; one part in 100,000 is evident."
>
> "Common yellow soap is far better than most of the fancy soaps. Castille soap used to be very good, and this may be obtained from any chemist; but olive oil from which it should be made is now generally mixed with cotton seed oil and this is not so good."

"Bubbles blown with soap and water alone do not last long enough for many of the experiments described, though they may sometimes be made to succeed. Plateau added glycerine, which greatly improves the lasting quality."

HIS LORDSHIP: I think that is sufficient.

WITNESS: On page 170 he gives quite a broad mixture which may be used for making bubbles.

Mr. HERRIDGE: Now, Mr. MacRae, if you have concluded your answer on that part of the case, I would ask you now if you have read the patent in suit, the patent to the defendant through Rice?

HIS LORDSHIP: Then, Mr. Herridge: if you have finished with that phase of the case we will adjourn until 2.30.

(Resumed):

Mr. HERRIDGE: I neglected, my lord, this morning to file a stipulation by the parties. It is the common form of stipulation.

EXHIBIT No. 4.—Filed by Mr. HERRIDGE, 6th December, 1928:—Stipulation.

Mr. BIGGAR: Our case is that there was no invention by Bayer at all, and if there was an invention of any kind, his patent is, in any event, bad and ours good. It has got two branches, my lord.

Mr. HERRIDGE: Mr. MacRae, have you studied the patent in suit, the patent, to John A. Rice?—*A.* Yes, I have.

Q. Will you discuss very briefly, with particular relation to what you said this morning on the Bayer patent, the points of the Rice patent as they occur to you?—*A.* The process described and claimed in the Rice patent, Exhibit 1, is identical with the novel disclosure of the Bayer patent. The similarity is that both documents disclose the novel process, as claimed to be the use of a foam in making porous building materials.

HIS LORDSHIP: A foam, did you say?—*A.* Yes, the use of a foam.

Mr. BIGGAR: I do not want to interfere with your lordship getting any information that may be useful, but the witness is now telling your lordship what the English of the Rice patent means. I do not think there is a word in it from end to end that is not intelligent to all of us.

HIS LORDSHIP: I have not seen it, and I was wanting to see if I required any assistance from it. It is a patent for cellular cement products. The product is the same as in the other?—*A.* Exactly the same.

Q. Now, if you could describe just briefly the process—because the probabilities are the specification is easily understood; I may be wrong, of course, but I do not see why it should be complex. Anyway, be as brief as you can?—*A.* The process is very briefly and concisely defined by Rice in, for example, Claim 2 of his patent, which reads:

"The process of producing a cellular product which consists in mixing a tenacious stable foam with a cement material and allowing the mixture to harden."

In the Exchequer Court.

Plaintiffs' Evidence.

No. 11. Alexander E. MacRae. Examination—*continued.*

The process thus consists in mixing a stable foam with a cement. That is the process disclosed by Rice; that is the process disclosed by Bayer.

Q. Is there anything else in that that you think might assist me?—*A.* There is this, I think, that would help your lordship, and that is, that it may be a bit confusing to you to appreciate just why the specification of this patent does refer to such a great variety of bubble forming agents. There are referred to in the specification of the patent some 17 general agents which may be used for bubble forming agents.

Q. Is that the paragraph commencing No.....?—*A.* That starts on pages 2 and 3. I can refer you to it particularly. He gives a specific one, my lord, at the top of page 2, the first one. Then a little further down at the end of that page 2, he indicates a variation in the percentage of glue. He says:

> "In other cases I have found glue solutions of a much lower strength to be very suitable, thus a solution of about one part of glue in 100 to 200 parts of water, . . ."

and then at the top of the next page 3, he says, "as used ten to fifteen per cent. in glue." Then he goes on further and says, in place of glue I can use some dozen other things, that he mentions there, Irish moss being amongst the ones mentioned. And then in the next paragraph your lordship will notice that he says various additions may be made to those things that I have previously described, and there he describes some 18 additions which might be made to the former ones. Then going on to the next page 4 beginning with paragraph 3, he describes particular mixtures which give very useful results, and those are numbered from A to D, so that there are a great many of them. In all, if one calculated the number that he there discloses, there would be many hundred of them, because you will notice that in the ones that may be added to the first ones, he says that they may be added to any one of the ones mentioned before. And in those particular mixtures which he mentions at pages 4 and 5 there are some that obviously would be entirely impracticable commercially, because one would not use expensive materials, such as some of these are, when simple saponins or simple mucilaginous solutions would do.

Mr. HERRIDGE: Would you say, Mr. MacRae, that any of these specific illustrations given taught anything to the art at the time?—*A.* Oh, not at all, unless there might be something in the particular percentage of some of these unusual ones which he mentions, such as cresol compound and phenol. There may be some particular thing in some of those, but it is to be noted that if that is so such particular results are not mentioned in the claims, because the claims do not deal with any of those special mixtures. There are only two claims in the patent which refer to percentages, and one of those is Claim 13 which specifies a mixture of 1% of glue, 98-4/5ths per cent. of water and 1/5 of one per cent. of formalin, and Claim 18 specifies a one per cent. of glue with 1/5th of one per cent. formalin. Formalin is a solution of formaldehyde; then 98% of water. There is, incidentally, a little inaccuracy in that claim but it is immaterial.

Q. Would you point out, very briefly, wherein, in the specification, the constituents of the foam mentioned by Rice are to be found in Bayer's specification?—*A.* There is no foam described or defined in the Rice specification which has characteristics different from those described in the Bayer disclosure unless as a result of using some of these peculiar mixtures which Rice sets up; he does not claim some different specific compound might be made, but Rice does state clearly in his specification that it does not matter what the foam is made of; any foam at all which may be used comes within the terms of his disclosure. He states:

> "But I wish it to be distinctly understood that my invention, in its broad aspects, is not limited thereto, inasmuch as any foam, no matter how made, and no matter of what it may consist falls within the scope of my invention."

That, of course, is obviously a very inaccurate statement, because the novel thing which Rice disclosed, in common with Bayer, was the mixing of a foam with the cementitious material, whereas hitherto in the art the bubbles had been released and formed chemically by the reaction of some acid material, with a carbonate which released the C.O.2 gas, and there was difficulty experienced in practice in getting uniformity of porous products by that old chemical method, and the importance of this new disclosure made by both Rice and Bayer was that you could regulate the porosity with great ease by the simple expedient of making this foam mechanically rather than by developing it chemically.

His Lordship: If you slaked a plain lime with water you would get cellular forms would you not, in the lime?—*A.* The only porosity that might be developed there, sir, might be occasioned by the occlusion, the incidental occlusion of air which might be held there during the slaking of the lime. There is not the porosity that would be attained in doing a process of this kind, if one did put a bubble forming agent, such as any that are used in making foam, in a lime, and put air in it; you would get a porous lime structure, capable of setting and holding it. Ordinary lime, however, would not readily set in its natural state.

Mr. Herridge: Did you find in Bayer any direction equivalent to the direction which you found in Rice under the phase: "Tenacious and stable foam?"

Mr. Biggar: I object, my lord. I really do think that my learned friend's witness has simply been arguing the case. He has not been giving anything that could be called expert evidence. My learned friend's present question is as to what he found in a perfectly intelligent document which we are all quite capable of understanding.

His Lordship: There is force in the objection, but I will allow it.

Witness: In the first paragraph of the Bayer disclosure he says that by adding frothy substances in an indifferent manner, indicating that it might be added in any way one likes. Then in the next paragraph he says:

> "It has turned out that a suitable choice of such substances makes it possible to produce a foam, which during the ensuing shaping

In the Exchequer Court.

Plaintiffs' Evidence.

No. 11. Alexander E. MacRae. Examination—*continued.*

of the material is of such a durability that a great number of air bubbles are left in the mass."

HIS LORDSHIP: That is enough for that.

Mr. HERRIDGE: Have you got anything further, which in your opinion, will assist his lordship in regard to the disclosures in the specifications?—*A.* There is much that might be said about some of the specific percentages mentioned in Claim 13 and Claim 18.

Q. Are they, in your opinion, a practical method of carrying out the foam making process?

Mr. BIGGAR: That is not relevant.

HIS LORDSHIP: What is the question?

Mr. HERRIDGE: My question was in regard to Claim 13 and Claim 18. Do they disclose a practical method of carrying out this foam making process?

Mr. BIGGAR: That is not the ground upon which the patent is attacked. It is not suggested it is not useful. There is only one ground of attack; it is only impeached on one ground.

Mr. HERRIDGE: My answer to that is perfectly conclusive, that is, we are seeking to show that this surplusage in the first paragraph, as your lordship suggested, means nothing towards the differentiation of the Rice patent with the Bayer patent.

HIS LORDSHIP: Mr. Biggar says that you are not contending that Rice's is not a practicable thing.

Mr. HERRIDGE: No, we are not contending that Rice's is not a practicable thing. What we are contending is that the Bayer disclosure absolutely and finally anticipates the Rice disclosure, and there is nothing in the latter by which the Rice can be distinguished from the Bayer, and, therefore, I submit, my lord, it is quite proper for me to offer evidence showing that all these fancy phrases and paragraphs, and this long written document means nothing more than my witness has said it means, a mere disclosure, by taking a pre-made foam, mixing it as a cement, to get a cementitious porous structure.

HIS LORDSHIP: When I said I would allow the question, of course, I thought perhaps you were attacking it on the ground that it could not be worked out.

Mr. HERRIDGE: No, I am not making that specific attack. I am saying though, and the thing amounts to the same thing—that I want to show, and I submit I have the right to show, that anything which Bayer does disclose which is found in Rice is surplusage and means nothing, and that is the reason I ask that question.

HIS LORDSHIP: I just do not quite see the necessity of it. However, if you think it is important I am not going to stop it. What is the question again?

Mr. HERRIDGE: The question is in regard to claims 13 and 18. Do they, in the opinion of the witness, suggest an operative method of carrying out this foam-making process?

Mr. BIGGAR: That, I submit, there is no doubt about at all. My friend asks the thing on a comparatively different ground from one that could possibly justify his question. He has not attacked this claim, or any of those claims on the ground that they are not operative, and we are not prepared to meet any such case.

HIS LORDSHIP: I will allow the question.

Mr. BIGGAR: Your Lordship sees it alters the whole character of the case.

HIS LORDSHIP: I just want to see how far this question will go.

Q. Does it suggest an operative form? What is your answer, just in a word?—*A.* My own experiments indicate that that particular percentage of foam, with the formaldehyde there mentioned, would not work. In my opinion it adds nothing to the disclosure of Bayer which is essential to enable one to produce the invention.

HIS LORDSHIP: Well, now, Mr. Herridge, you got an answer to a question suggesting a defence which you have not raised.

Mr. HERRIDGE: Looked at in the light of what my friend says. The only purpose in asking the question was to show that there is nothing in these particular illustrations given in the Rice specification, or in his claims, which differentiate their patent from the patent of Bayer. Judged from the point of view, from the stand point of invention——

HIS LORDSHIP: I know, but the answer which the witness gave goes to the point that claims 13 and 18 are not operative, and Mr. Biggar says that is not pleaded. He is not here to answer such a case. You cannot get over that.

Mr. HERRIDGE: Then I will put the question in this way——

HIS LORDSHIP: Strike that question out.

Mr. HERRIDGE: Do claims 13 and 18 disclose a method different in principle, or in practice, from the methods which are to be found, the methods of the foam-making to be found and suggested in the Bayer patent? —*A.* No, they do not, for this reason: that if one were using glue as his froth-forming agent he could not very well use much less than one per cent. of it, therefore, he would have to use what is disclosed and claimed specifically in this claim, and one-fifth of one per cent. of formalin is a very small amount equivalent to the amount of glue used. So that one could not use glue without using that, and if Bayer did as he said he did that is, made use of a mucilaginous material which is quite the equivalent of glue, he could not operate the process without doing what is stated in that claim.

HIS LORDSHIP: Mr. MacRae, on a bare construction of both specifications you do not see any difference, except Rice mentions more re-agents which might be used?—*A.* Exactly, my lord.

Q. He is more specific than the other person?—*A.* Yes.

Q. There is nothing obscure or hidden in the document of Rice?—*A.* I said it is very clear, quite clear. In so far as teaching one in the art to do something it discloses nothing more that would be of assistance to him than did the Bayer disclosure.

In the Exchequer Court.

Plaintiffs' Evidence.

No. 11. Alexander E. MacRae. Examination—*continued.*

Mr. HERRIDGE: *Q.* Then would you say that these particular instances and illustrations to which you have been referring are unnecessary disclosures?

HIS LORDSHIP: Never mind that, Mr. Herridge. That is implied in his answer.

Mr. HERRIDGE: Then, my lord, I have just this other question to ask the witness on this point. Taking the Rice claims, if possible in groups, can you state whether the disclosures of these claims are to be found in the Bayer publication?

Mr. BIGGAR: That is not a proper question.

Mr. HERRIDGE: I submit that is a perfectly proper question.

HIS LORDSHIP: You mean to say are the disclosures in Rice to be found in Bayer?

Mr. HERRIDGE: Are the disclosures as set out in the claims of Rice—because it is the claims of Rice we are attacking—to be found in Bayer?

HIS LORDSHIP: I do not see any objection to it, but he has answered that already.

Mr. HERRIDGE: He answered in regard to the specification, just a general answer, but I would like to put it in this definite way, and I submit it is a most proper question to ask.

Mr. BIGGAR: Of course, my learned friend is entirely wrong in his statement. He is not attacking the claims of the Rice patent. He is asking your Lordship to set aside the Rice patent because it is invalid, on the ground of being anticipated by Bayer. It is not a question of the claims at all, no question of the claims. The question is, whether the invention disclosed by Rice has been anticipated by an invention made by Bayer.

HIS LORDSHIP: Your own witness says that they are both the same thing. It does look to me as if anticipation is your case.

Mr. HERRIDGE: Prior inventorship is our case, which is the same thing. We say, first, that we made the invention before Rice, and that that invention when made by us was the duplicate of Rice——

HIS LORDSHIP: Mr. MacRae has said that.

Mr. HERRIDGE: Yes he has said that in a general way, but if I might ask him this: Do the claims in the Rice patent disclose anything which is not found in the Bayer patent? That is a simple question.

HIS LORDSHIP: Or do you find anything in the Rice claims which are not principally to be found in Bayer?

WITNESS: No, nothing.

HIS LORDSHIP: I supposed you would say that.

WITNESS: I can qualify that answer to make my position more clear, if there is any necessity for doing so.

Q. If you can find anything that is, of course, quite conclusive.—*A.* There may be something in cross-examination.

Mr. HERRIDGE: Now, Mr. MacRae, have you read the Commission evidence taken in Denmark?—*A.* Yes, I have.

Q. And have you tried to carry out any experiments on the disclosure of that evidence?—*A.* Yes. I made experiments of the processes disclosed there.

Q. The process disclosed being what?—*A.* The mixing of a foam with a cement, or other cementitious material, the foam being made from one or other of the soap bubble forming agents mentioned in this evidence.

Q. What bubble-forming agents are mentioned?

HIS LORDSHIP: Mr. Herridge, is that necessary? The evidence seemed quite simple to me.

Mr. HERRIDGE: I am just asking this witness if he carried out an experiment on this.

HIS LORDSHIP: It is not regular to have a witness give opinion evidence about the evidence of another person.

WITNESS: I did make experiments there, and made products which were porous, from gypsum and from cement.

Mr. HERRIDGE: Did you get satisfactory results?—*A.* I did. The material was full of pores or cells.

Q. And do you find anything in the Rice patent which is not disclosed to you in the Bayer evidence?—*A.* Nothing essential.

Mr. BIGGAR: I object, my lord.

Mr. HERRIDGE: I refer you to page 3 of the Bayer evidence, and I would ask you, in question 16, if you have had any experience, or if you have any common knowledge, any knowledge of a man skilled in the art, of whether or not a fermented solution of sea tang and a fermented solution of tangin is a proper material from which bubbles can be made for commercial purposes?—*A.* I have not myself tried a solution of an extract from sea-weed to find if it would ferment, but from my knowledge of similar substances I would suppose that such a solution would ferment if kept standing for some considerable time, particularly at the proper temperature. If the formaldehyde, for example, is used with the solution, it will tend to destroy any bacterial growth which might be there to cause fermentation, and my opinion is that a fermented solution of the extract from sea-weed would not be a good bubble forming agent. If the solution is not fermented, of course, it will act very well, and in order to avoid fermentation one might use the formaldehyde, which both Rice and Bayer stated might be used for hardening, or increasing the durability of the foam produced.

Q. Now, I think that is practically all. You have looked at the copy of the note book showing the experiments made by the associates of the inventor Bayer?—*A.* Yes, I have.

Q. Do those experiments set out any particular methods of making the foam?—*A.* No, they do not.

Mr. BIGGAR: Might I suggest, my lord, that my friend should confine his questions to this witness to something that is admissible. The notes are perfectly capable of being worked out by us.

Mr. HERRIDGE: My purpose in doing this is to try and find the simplest way, through this evidence, for His Lordship's complete understanding of

In the Exchequer Court.

Plaintiffs' Evidence.

No. 11. Alexander E. MacRae. Examination—*continued.*

the situation. That is all I have to ask, and if my friend had not interrupted I would have got through before now.

HIS LORDSHIP: *Q.* You are asking the witness to state whether the formulas, the notes made in the book by one of the witnesses abroad, set out any particular methods of making the foam?

Mr. HERRIDGE: It was a simple question, and it was a simple answer which was given. It was simply to save your Lordship the trouble of going through this mass of evidence.

HIS LORDSHIP: Well, put the question again. Tell me what is in the book first.

Mr. HERRIDGE: This is a copy of a note-book evidencing the experiments made by a Professor Philipsen, who was employed by Bayer, and who worked under Bayer's direction.

HIS LORDSHIP: Well, Mr. Herridge, it seemed quite plain to me. I do not think you need put the question.

Mr. HERRIDGE: All I have to say is that the question was a simple question. I got a simple answer, and my friend was not being very seriously prejudiced by it.

Cross-examination.

CROSS-EXAMINED BY MR. BIGGAR.

Q. Mr. MacRae, you told us you have had a good deal of experience with the manufacture of cementitious material which is cellular by reason of its being mixed with foam?—*A.* Yes.

Q. And that experience goes back over two or three years, does it?—*A.* Yes, at least two years.

Q. A little more than two years does it not? Does it not go back to the time that the application was made for the Bayer patent?—*A.* No, I had no experience with those materials at that date.

Q. Not until after that?—*A.* I do not remember at the moment the date of the Bayer application.

Q. The Bayer application was made in the latter part of 1924.

Mr. HERRIDGE: Are you speaking about the Canadian or Danish?

Mr. BIGGAR: *A.* Canadian.

Q. Did you have anything to do with the Danish application, Mr. MacRae?—*A.* No.

Q. Well, coming back then to the Canadian, was it before or after the Bayer application in Canada?—*A.* After, I think.

Q. That you became interested in this subject?—*A.* Very considerably after the Bayer application.

Q. Notwithstanding that you were the Patent Attorney who acted for Mr. Bayer in making application?—*A.* My firm was, yes.

Q. Well, I find on the certified copy of the file a power of attorney from Erik Christian Bayer, the patentee, to E. A. MacRae, Patent Attorney, Resident Manager of Marks & Clerk, 128 Wellington Street, in the City of Ottawa, in the Province of Ontario.—*A.* That is not so. You are misreading the document.

Q. Well, I will put the document in if there is any difference of opinion about it.

Mr. HERRIDGE: Do I understand my friend to attack the credibility of this witness?

His LORDSHIP: I do not know exactly. Mr. Biggar would not misread the document.

Mr. HERRIDGE: I am not worrying about the misreading of the document. I am worrying about this question. We have had experience of this nature before in other cases, and I think it is unfair for Mr. Biggar to state——

His LORDSHIP: Mr. Herridge, let us get along.

Mr. BIGGAR: I will put in the certified copy from the Patent Office of the record filed, exclusive of the specification remaining on record in the Patent Office, relating to Patent No. 265601, bearing date so and so, and granted to Erik Christian Bayer, and the second document I find on that file is the patent with a power of attorney made by Erik Christian Bayer, a subject of the King of Denmark, and so on, and the third paragraph of it is:

> "Your Petitioner, therefore, prays that a patent may be granted to him for the said invention, as set forth in the specification in duplicate relating thereto.
>
> Said petitioner hereby appoints A. E. MacRae, Patent Attorney, Resident Manager of Marks & Clerk, 128, Wellington Street, in the City of Ottawa, Province of Ontario, to represent him and stand in his place and stead for all the purposes of the Patent Act including the service of any proceedings taken thereunder."

His LORDSHIP: What is the date of that?

Mr. BIGGAR: The Petition, my lord, is dated on the 4th September, 1924.

WITNESS: If my friend will complete the document your Lordship will see that my answer was quite correct. That does not appoint me as his solicitor. That appoints me as his representative under section 12 of the Patent Act, which gives me personally no authority as a solicitor. The next paragraph names his attorneys for the prosecution of the application, which was my firm. It is a small point, but it is the fact.

Mr. HERRIDGE: Will my friend state what the point is in raising the question?

Mr. BIGGAR: Now, Mr. MacRae you did act for Mr. Bayer in making his application?—*A.* I personally was named as agent for service, under section 12 of the Patent Act, as representative for Mr. Bayer, and my firm was appointed as his local solicitors in connection with the obtaining of the patent.

Q. And you personally acted in connection with the application?—*A.* I did after it was placed in conflict with one of Mr. Rice's applications. It came to my personal attention then.

In the Exchequer Court.

Plaintiffs' Evidence.

No. 11. Alexander E. MacRae. Cross-examination—*continued.*

Q. There is no doubt about it that you personally acted, and that you are the Mr. MacRae referred to in the petition which I read?—*A.* Yes, there is no question at all about it.

EXHIBIT A.—Filed by Mr. Biggar, 6 Dec. 1928: Certified copy of patent file No. 265601.

Q. And you also acted in the capacity of Patent Attorney, as Manager of Marks & Clerk, for the Canada Gypsum Company to which you referred? —*A.* Yes.

Q. And, so far as you know, the Canada Gypsum Company is the only company that is operating a process of this kind in Canada?—*A.* As far as I know that is so. I have no knowledge of other companies.

Q. And it was as a result of your interest in products of this kind for the Canada Gypsum Company that you became acquainted or acquired the knowledge you have on the subject, apart from this litigation?—*A.* Yes, quite.

Q. And the Canada Gypsum Company, have they a license from the plaintiffs?—*A.* I cannot say.

Mr. HERRIDGE: I object to that question, my lord.

Mr. BIGGAR: You have no information as to that?—*A.* I have no personal knowledge on the subject.

Q. You have visited the Canada Gypsum Company's plant?—*A.* Yes.

Q. And you are familiar with the processes that are carried on?—*A.* Yes.

Q. And those processes have been subject to a great deal of development by the Canada Gypsum Company?—*A.* Yes, they have been active.

Q. They have taken out a good many patents for improvements in the process of manufacturing this material?—*A.* Yes.

Q. And in connection with those patents you have acted?—*A.* Yes.

Q. So that you have had occasion, in that way, to go into the whole subject?—*A.* Yes.

Q. And all those experiments which you made, and to which you have referred, were made after you had acquired the information that we have just been speaking of?—*A.* Which experiments do you refer to?

Q. The experiments of which you gave evidence this morning?—*A.* No, not all.

Q. Well, how many?—*A.* Well, now, I cannot tell you.

Q. At any rate, it was after you had become familiar with the disclosure in the Rice patent?—*A.* Yes, my practical experiments were made after I had seen the Rice patent. I never paid much particular attention to it until recently.

Q. Yes, and as a matter of fact, the percentages that you used for your experiments were the percentages given by Rice?—*A.* No, with the exception of the experiments that I mentioned, with the use of glue. I made that experiment within the last week, with a view to ascertaining the practicability of the disclosure of that claim 13.

Q. Yes, and your selection of saponin for one of your experiments was due to your familiarity with the art?—*A.* Yes, having seen it particularly referred to in the Stanford patent, for example.

Q. Both these patents that we have to do with are patents that any ordinary workman might be able to work, are they not? There is nothing that requires a scientific training to manufacture this material?—*A.* No, not at all, it is a very simple process.

Q. Any ordinary workman who is familiar with making cement ought to be able to make this material?—*A.* Yes, I should say so, certainly.

Q. There was one remark which you made. Perhaps I misunderstood you. You said that the smaller the size of the bubbles the greater their stability?—*A.* The smaller the size of the individual bubbles the greater the durability of the foam.

Q. That is true only when you are comparing bubbles of different sizes made from the same material?—*A.* That is true when comparing the durability of two foams.

Q. Of the same material?—*A.* That is true, generally. A reduction in the size of the bubbles will make a more stable foam.

Q. I mean, your general statement is only true when you are comparing bubbles of the same material?—*A.* Well, a foam composed of fine bubbles, when you use a particular material, might be very much more stable than a foam having larger bubbles when made from another material.

Q. I do not think you follow me. Larger bubbles of some materials that were adapted particularly to make foam might be very much stronger than smaller bubbles of another material that were less adapted to make foam?—*A.* No, I would not make that general statement.

Q. Well, take water which does make bubbles, does it not?—*A.* Yes, you can make bubbles with water.

Q. Then take saponin. Would large bubbles of saponin necessarily be weaker than small bubbles of water, or the foam of each, whatever you like?—*A.* No, because you could not make a foam from water which would stand up long enough.

Q. Well, you could make a foam. You have seen a foam with water?—*A.* Not pure water that will stand to make a foam.

Q. Never seen water in a foam?—*A.* Oh, yes. That is not pure water. When you see a foam at the end of the shore that is not pure water. There is organic material in the water.

Q. All right, that is sufficient for my purpose. When you see the foam at Niagara, or at the shore, you have got a foam in water practically, have you not?—*A.* There are bubbles of water, yes, individual bubbles scattered about on the water.

Q. Would larger bubbles of saponin solution necessarily be weaker than smaller bubbles of that water, Niagara water or Ottawa water? Would larger bubbles of saponin necessarily have less stability than smaller bubbles of Niagara or Ottawa water?—*A.* No, not necessarily.

Q. Of course not. In other words, when you say that the smaller the bubbles the more stable the foam, you are comparing a foam of the same

In the Exchequer Court.

Plaintiffs' Evidence.

No. 11. Alexander E. MacRae. Cross-examination—*continued.*

material in large and small bubbles?—*A.* Not necessarily. The same applies to foams made of different materials. The relative difference will be more with some than with others, but that is a general statement that will apply to the broad situation as well as to what——

Q. As a scientific man, you are prepared to give expert evidence, Mr. MacRae, and when you think of it I am quite sure you will agree with me that the only scientific statement that you can make, the only general statement of fact that can possibly be true, is, that where you have compared the foam of a given material in large and small bubbles the foam in the small bubbles will be more stable than the foam in the large?—*A.* That is true.

Q. You cannot extend that statement to compare the foam of two or more materials, can you?—*A.* Speaking generally, you can, quite scientifically and accurately. If you apply it to particular ones it may not apply generally.

Q. You can make the broad statement with regard to the comparative qualities of the foam of two materials, but you cannot make any general statement because you have admitted to me that the larger bubbles of a saponin solution would be stronger than the smaller bubbles of an ordinary river water?—*A.* If I read to you a portion from Mr. Rice's patent it will support my answer.

Q. What is the answer, please?—*A.* My answer to that question,—I did not get the exact terms of your last question.

Q. I say that no such statement is true when you are comparing a foam of saponin with a foam of water. There is no doubt about it, is there?—*A.* About what?

Q. The saponin foam, though in larger bubbles, will be stronger than the foam of water though in smaller bubbles?—*A.* You cannot get a foam of water that will stand up.

Q. I am not talking about a foam that will stand up, and you did not make any restriction to foams that will stand up. Follow me and not look at your papers, and I think we will get on a little more quickly. You are restricting it now to foams which will stand up?—*A.* Yes.

Q. Only——?—*A.* I make this general statement——

Q. I say, are you restricting your statement to foams which will stand up?—*A.* Well, what is your question?

Q. Are you restricting the general statement that you made to foams which will stand up?—*A.* No, that is generally true.

Q. It is generally true of all foams, whether they will stand up or not?—*A.* Well, if you have a foam it must stand long enough to be a collection of bubbles, otherwise it is not a foam. You can get individual bubbles which are not foams, do not constitute a foam.

Q. Now, you tell me that water won't make a foam which will stand up, which do you mean?—*A.* Water alone will not make a collected foam which can be regarded as a foam, in the sense in which we are using it here.

Q. Notwithstanding that we see it on the Niagara and the Ottawa?—*A.* I did not mention the Niagara.

Q. But you did see it?—*A.* I did not see the Niagara.

Q. I said notwithstanding that you see foam at falls, waterfalls, such as the Niagara and the Ottawa?—*A.* I do not know about the Niagara. I do know about the Ottawa. I have seen foam there, because there is much more organic matter in the water of the Ottawa River.

HIS LORDSHIP: Mr. Biggar is asking you, generally speaking, Mr. MacRae, the smaller the bubble the more stability?—*A.* Yes, my lord.

Q. That is, generally speaking. Now, Mr. Biggar wants to know if it might not happen that a bubble made from one material might not be larger than that made from another, and still be as strong?—*A.* That might be so.

Q. Well, I think that answers it?—*A.* That is quite clear, but to make the general statement that is what I was not prepared to do, my lord.

HIS LORDSHIP: The witness states, that generally speaking, the small bubble has greater stability than the larger one, but bubbles formed from one material might be larger than that formed from another and still have the greater stability.

Mr. BIGGAR: Quite so, my lord. In other words, the witness is now really stating the point that I put to him, that it depends altogether on the materials, that he can never really compare bubbles from the same material different in size.

HIS LORDSHIP: He says that there may be a difference.

Mr. BIGGAR: Yes.

Q. In other words, if you have bubbles of the same size in the foam of two materials there may be a wide divergence in the strength of that foam and of the bubbles, am I not right, Mr. MacRae?—*A.* That may very well be, yes. I have not qualified my statement at all, and I would like to refer again to what Mr. Rice says on that point.

Q. If my friend, Mr. Herridge, wants to go back on it you will have every chance to do that. I can say that you are the Manager of Marks & Clerk, and a patent attorney, and you have not actually been working at chemistry as a profession?—*A.* Yes, I have been working at chemistry as a profession.

Q. Since how long ago?—*A.* Fourteen years.

Q. Not for fourteen years?—*A.* For the last fourteen years continuously since I left the University.

Q. Have you been doing regular chemical laboratory work since that time?—*A.* The chemical profession is not confined to laboratory work. My work has been chemical, and I have been following my profession chemically since then.

Q. Combining it with the business of a patent attorney?—*A.* Yes.

Q. And did you make any tests with regard to the bubbles, the effectiveness of the bubbles in materials from the point of view of the reaction between the material out of the bubble and the cementitious material with which it was mixed?—*A.* Yes, I did.

Q. And that is an important element, is it not, for the purpose of comparing it; for the purpose of making an effective cellular cement you

In the Exchequer Court.

Plaintiffs' Evidence.

No. 11. Alexander E. MacRae. Cross-examination—*continued.*

want a tenacious bubble that will stand up when it is mixed; that is true is it not?—*A.* Yes. You want to get the foam into the cementitious material.

Q. And consequently you must not make it out of material which will in the chemical reaction between it and the cementitious material break down?—*A.* There will be no chemical reaction, or if there is any it will be so insignificant as not to be considered, and it is not considered in this practically because this is purely mechanical. This is one of its advantages over the previous method of doing it mechanically, particularly when dealing with material such as gypsum which has its own inherent setting capacity by the addition of water. It is advisable to avoid putting in any external material in so far as that is possible, because that interference with the natural setting of the material, and natural setting gives the strongest product.

Q. Exactly, but there are materials which will make foam, which would have a deleterious reaction with the cementitious material, are there not?—*A.* I do not know of any materials that would react with cement or gypsum in a bad way, that is, to affect the setting of it.

Q. You do not know of them?—*A.* No, I do not.

Q. Now, the experiments that you referred to, when you were speaking of the evidence taken in Denmark, are the same experiments which you described to Mr. Herridge a little earlier?—*A.* They were among the same group of experiments, yes.

Q. Well, you have described to us all the experiments you have made? —*A.* No, I have not described all I have made.

Q. Well, you have described the experiments with saponin, soap and glue. They were the experiments that you referred to when my friend asked you about the experiments based on the Danish evidence?—*A.* They were in that group, yes.

Re-examination.

RE-EXAMINED BY MR. HERRIDGE.

Q. You were speaking, Mr. MacRae, in giving your answer to the question of Mr. Biggar, about the formation of bubbles in what he terms the natural river water. Can you supplement your answer?—*A.* That is with respect to the subdivision of the bubbles forming the foam. The patent in suit says, on page 3:

> "When using the dilute glue solutions, such as O. 5 per cent. it is usually necessary or advisable to give a long and very vigorous beating, to give a tenacious and stable foam."

That indicates that the beating of the foam for a longer period of time increases the subdivision, and, therefore, makes the bubbles finer and the foam more durable. I know, from my own practical experience, that that is so, and it is in practice. By the use of a soap solution or a saponin solution one can make quite a stable form without the addition of formaldehyde or anything else, merely using the soap solution or the saponin solution, and

by the agitation to subdivide the foam to the fine particles get a foam which will stand up for quite a lengthy period of time.

HIS LORDSHIP: This case seems to be very narrow. Had we started earlier in the morning I think we could have finished this case.

(*This witness was re-called—see p.* 98.)

No. 12.

Evidence of George M. Thomson.

GEORGE M. THOMSON, sworn. Examined by MR. HERRIDGE.

Q. What is your full name, age and occupation, and place of residence, Mr. Thomson?—*A.* My name is George M. Thomson. I am a Mining Engineer, specialized in non-metallics.

Q. What specialized technical experience have you had in this art, Mr. Thomson?—*A.* Well, my earlier recollection of the subject of insulation came up during the War. I happened to be a member of the Munitions Inventions Department of the British War Office, and during the latter part of the War the matter of insulation came up then. My first contact, or direct contact with the matter came up in 1922, when the Chicago owners of the Ashenhurst patents came to me for advice regarding the use of minerals in connection with the process. Their process involves the expanding of cementitious materials, such as gypsum or plaster of paris, using chemicals inherent to the dry mix, which on being hydrated cause the acid inherent to the mix to react on the carbon dioxide gas. These gentlemen also came to me for advice in regard to the use of what we call a colloidiser. It is a term that may not be technically correct. It was used in lieu of a better term for describing the action of such a constituent. If no mucilaginous or gummy substance were dissolved in the water the gas would break through the cement and be lost. In other words, the cementitious material after hydration would slump, because the gas on being generated would be evolved and lost in the atmosphere unless it was held. The inventor used first of all glue for this purpose to hold it. He later on used a blood albumen made from animal materials, from the packing houses. It was absorbed by quicklime to make a dry material. They found that certain of these colloids, or, for a better word, may I use mucilaginous materials, affected the time of set of these materials, and it was for that reason that they came to me for advice at that time. It was then that I became very much interested in the fabrication of cellular cementitious products. That was about the first of August, 1922. The Insulex patents, owned by the Ashenhurst interests of Chicago were sold to the Canada Gypsum and Alabastine Company, Limited. It was then, in fact, the Ontario Gypsum Company.

In the Exchequer Court.

Plaintiffs' Evidence.

No. 12. George M. Thomson. Examination—*continued.*

At the end of 1925, or January, 1926, I was retained by the Ontario Gypsum Company, at that time to act in a consulting capacity to them on general production matters. One of the first duties that I performed for this company was the attempt to make cellular gypsum materials without the use of chemicals inherent to the dry mix. In other words, I was to attempt to make a cellular product by the injection of a gas not under pressure.

In fabricating a material such as a wall-board or blocks, on a continuous machine, it was necessary that that gas should not be under pressure, otherwise there was an expansion of the material after it had passed beyond a point where it was screeded off.

We had a good deal of success in aerating or making cellular gypsum by that process of introducing air as a gas not under pressure into the gypsum slurry, so that expansion was completed before the material was screeded off or given its final dimensions, you may say.

During the process of reasoning in this development, I conceived the idea of controlling the product in continuous fabrication by making all my air bubbles beforehand rather than afterwards, that is, taking the uniform aeration of the gypsum before the mixing took place. The idea came to me for this reason: That in this continuous process if we could make a foam, for instance, and mix the foam into the slurry we could make a more uniform product and be able to make a continuous product.

In carrying that out in the laboratory, the first foam that was used, the first that came to my mind, was naturally a whipped egg foam, that is, the white albumen of an egg, and we took the white of an egg and beat it up with an egg beater and mixed it in with the plaster of paris slurry.

Just as an example of what did happen, my lord, I wish to submit a sample of gypsum aerated with the white of an egg. I may state that this sample was made several days ago. This was not one of the original samples, but it was made with the white of an egg, if you care to see the character of it, my lord.

EXHIBIT 5.—Filed by Mr. Herridge, 6 Dec., 1928: Sample of gypsum aerated with white of egg.

Mr. HERRIDGE: *Q.* Did you make any others, Mr. Thomson?—*A.* Realizing at once that it was possible to aerate a gypsum slurry with a foam, I recalled the colloids that were first mentioned by the Sanford patent, which I knew of in connection with the Insulex patents in 1922, during my work advising those people at that time, the Ashenhurst people; and knowing also that saponin was the purest form of vegetable material that would produce foam,—as a matter of fact nearly all the foam on lager beer is stabilized with saponin, about one ounce of saponin to a barrel of beer, and I obtained some saponin from a chemical firm, and made a foam with the saponin by simply stirring it up with an egg beater in a dish. That foam was taken off and mixed in with the gypsum slurry. That was in August, 1926.

By the middle of November, 1926, we had the apparatus developed for producing foam in a continuous stream, and were aerating the slurry that was being made in a certain product in the plant of the Canada Gypsum Company, of which I happen to be Consulting Engineer. It was not introduced into all the board at that time, but it was put into one product, and from that date to this has been successfully carried on. Improvements have been made in the foam-making machine, but we still use a saponin product, because it is much cheaper to use.

Q. And, Mr. Thomson, as between 1922 and 1926, was there anything you learned fundamentally new about the making of foam?—*A.* Not at all. We still use the foam that was used by Sanford.

Q. And which you used in 1922?—*A.* Which we used in 1922. A foam is the aggregate of an infinite number of small air bubbles. Those small volumes of air retain their identity because they are surrounded by a film of water. Water is not strong enough itself. It is not elastic enough to remain as a permanent film around that bubble of air. Organic materials are put into it to increase the surface tension around that bubble. In other words they are put in there to make the water more elastic, and that happens when a child is making a soap bubble. He puts the soap in there to increase the surface tension or to make the water more elastic so that it will stay up around the smaller volume of air.

Q. Now, Mr. Thomson, just one point. When you speak about using the same foam as Sanford, I suppose you mean the same foam-producing substances?—*A.* It is the same foam-producing substances. After aerating this slurry in the early part of 1926, and finally evolved, or came to the idea of pre-making the foam to make an easier process of manufacture, I thought, as a matter of fact, that I had made an invention, and I might say at a later date—I think it was the end of December, 1926—I was very keenly disappointed to learn that someone else had manufactured a pre-made foam and aerated his slurry by mixing the pre-made foam into it. I certainly have learned nothing.

Q. In the same way in which you did it?—*A.* In the same way that I did.

Q. And in 1922, Mr. Thomson, to go back for a minute, were there many foam-making substances which you, as a man skilled in the art, had common knowledge of?—*A.* Well, I knew of one in particular which I did not see mentioned very much. From my experience in 1919, with, if I may mention the material—I do not think I am free to mention the product—it was used in connection with tannic acid, or gallotannic acid was the acid that was used. We got a foamy action in connection with another experiment in 1919, but personally I have learned nothing new about foam-making agents since that time, since I made my first experiment.

Q. So that the foam re-agents mentioned here in the patent in suit were followed as foamy agents to your knowledge in 1922?—*A.* And before that, yes.

Q. And among them, I suppose, there were many foam re-agents derived from mucilaginous substances?—*A.* Well, in December, it was

the latter part of December, 1926, or the early part of January, 1927, I was shown a copy of the Bayer patent for the first time. At some subsequent date, I think it was February or March, 1927, I saw a copy of the Rice patent. But that was when I suffered my disappointment after learning that someone else had done what I thought was a real invention.

Q. Let me interrupt. So that this work you are speaking of is prior to the date on which you first learned of the Bayer patent?—*A.* Yes, I knew nothing of it before that.

Q. Then when did you first see the Bayer patent, Mr. Thomson?—*A.* I first saw the Bayer patent toward the end of December, 1926, or January, 1927. I cannot fix the exact date, but I know the date is associated with the New Year in my mind.

Q. And I suppose you naturally studied it?—*A.* I went into it very minutely.

Q. And did you try to carry out any instructions on the teaching of the Bayer patent?—*A.* Well, I was interested in the manufacture of foam from sea-weed, because we thought it might be a cheap source of supply of foam-producing material.

Q. When you speak about sea-weed what do you refer to particularly in that disclosure?—*A.* Well, they mentioned tangin in the patent. At any rate, the idea conveyed to me was one of sea-weed, and we had no sea-weed available excepting one which we obtained for another product for many years, I suppose, I might say for 35 years, at least, my principals have used Irish moss in one of their products.

His Lordship: They use sea-weed and kelp and eel-grass.

A. Eel grass is used in an insulating material but in a dried form. That is Cabot's quilt. That has nothing to do with it at all.

Mr. Herridge: You used the sea-weed?—*A.* Well, having this Irish moss, the first thing that came to my mind, of course, was Irish moss which my principals have used in one of their alabastine products for at least 35 years——.

Q. Is Irish moss a sea-weed?—*A.* We understand so. Incidentally I was interested in the disclosure by Bayer of the use of formaldehyde with his colloid, I prefer to call it, because we had found—my principals at least, long before my association with them—that it was necessary to put formaldehyde with the extract of Irish moss to preserve it. It would not stand 24 hours at room temperature without fermenting.

I may also say in this connection that our saponin has to be fixed with formaldehyde, otherwise it will ferment at any temperature about 60 degrees, and if the saponin solution, or soap bark solution has fermented it kills the foamy action of the extract, so that we find it quite imperative that formaldehyde should be used as a preserver. It does not affect the strength of it, however.

Q. Is it known as a scientific fact that sea-weed will give extracts?

Mr. Biggar: Don't lead the witness, please.

Mr. Herridge: I am not leading the witness.

His Lordship: Put the question again.

Mr. HERRIDGE: I am asking the witness is it known whether or not sea-weeds are substances which will render extracts from which foam can be made?—*A.* Foams can be made. It has been known for many years that foams can be made from mucilaginous substances, and to cite a particular case my principals, as I said before, have made a mucilaginous substance out of Irish moss, the sea-weed, for at least 35 years to my knowledge.

Q. And you mentioned the employment of formaldehyde for certain purposes in your work. As a matter of fact, can you make an adequate foam out of formaldehyde and glue, whatever combination you like?—*A.* Well, I cannot be specific in answering that question. In connection with some of our various products we use enormous quantities of glue, not in connection with any of our gypsum products, by the way; but in one of our departments we use enormous quantities of glue, and, to my knowledge, there are a good many hundred types of glues. Some are suitable for our purposes, others are worthless. I have tried many types of glues in making foams. Certain types of glue will make an excellent foam. Other types of glue have made a foam, but after using such quantities of solution in the water it affected the setting time of our cement, so that it was not a practical proposition at all. We have found that if glue were standing for some time it was necessary to preserve it with something or other, but using formaldehyde it killed the effect that we wanted in our foam. The use of formaldehyde with animal glues, as distinct from mucilage made from vegetable materials, was not an improvement. As a matter of fact, it tended to destroy the result that we were after.

HIS LORDSHIP: There is a distinction between glue and mucilage?—*A.* I am subject to correction, my lord, but my impression is that glue in this country is recognized as an animal glue, including fish glue as an animal glue. Mucilage is derived from vegetable substances.

Mr. HERRIDGE: Mr. Thomson, at the time you made that specimen of porous material with saponin, did you try any other soap-forming agencies?—*A.* When making that?

Q. Yes?—*A.* I made a sample with a solution from the purified saponin.

Q. I suppose you can make samples of any size in precisely the same way as you have made these small ones?—*A.* Exactly, yes.

Q. Why do you make this particular sample so small, for the purpose of convenience?—*A.* For convenience only. We make these by the cubic yard. That was made from a saponin solution. This was made from a soap bark extract.

EXHIBIT No. 6.—Filed by Mr. Herridge, 6 Dec. 1928: Sample from soap bark extract.

EXHIBIT No. 7.—Filed by Mr. Herridge, 6 Dec. 1928: Cellular gypsum made with soap bark foam.

Mr. HERRIDGE: And did you make any other specimens out of any other soap-forming agencies at that time?

In the Exchequer Court.

Plaintiffs' Evidence.

No. 12. George M. Thomson. Examination—*continued.*

HIS LORDSHIP: Have you got with you, Mr. Thomson, a sample of the product which your company makes commercially at the present time?—*A.* Yes, sir, I brought this sample of board.

EXHIBIT No. 8.—Filed by Mr. Herridge, 6 Dec. 1928: Sample of board.

Mr. HERRIDGE: Is that, Mr. Thomson, a product in which you incorporate the pre-made foam, made on the same principle as it was made by you in 1922?—*A.* Yes.

Mr. BIGGAR: That is misleading, because he has not suggested anything like that being made in 1922.

Mr. HERRIDGE: 1926.

Q. And in 1926, Mr. Thomson, you used the same bubble-forming methods as you used in 1922?

Mr. BIGGAR: Used what?

Mr. HERRIDGE: The same bubble-forming agents.

Mr. BIGGAR: Is that tendered as a suggestion?

Mr. HERRIDGE: It is a question.

Mr. BIGGAR: It is very leading, my lord.

Mr. HERRIDGE: I confess it is, but I am making it for the purpose of simplifying this thing, as he has already said——

HIS LORDSHIP: In 1922 I understand, Mr. Thomson, you made it, experimentally was it, or in quite commercial quantities?

Mr. BIGGAR: It was a mistake of my learned friend. He intended to refer to 1926, not 1922.

Mr. HERRIDGE: Excuse me. My question was in two parts, and it relates first to 1922.

HIS LORDSHIP: Mr. Thomson can tell that very quickly.

Q. When did you commence to use, in your products, pre-made foam?—*A.* In 1926, my lord, but I think Mr. Herridge has reference to the use of saponin which I used experimentally in connection with the advisory work on Insulex in 1922, as to bubble-forming agents, but the pre-mixing of the foam with the gypsum slurry was not done until August, 1926.

Cross-examination.

CROSS-EXAMINED BY MR. SMART.

Q. What was the nature of your studies of those colloids in 1922? You spoke of blood albumen and some other colloids that you investigated?—*A.* I do not quite understand your question, Mr. Smart.

Q. Well, you made a general reference to having been called in to consultation with respect to certain work in 1922, in connection with which you studied colloids. I want to know the nature of your experiments at that time in connection with these colloids?—*A.* Well, in doing experimental work it is customary to set out with a definite object. My principals required a colloid which was economical to use, that would provide the necessary increase in surface tension of the water surrounding each bubble and not affect the setting time any more than necessary.

Q. And that was in connection with a material like insulex?—*A.* Yes.

Q. And over what period did your studies extend?—*A.* Well, my association with the Ashenhurst interests of Chicago, the owners of the Insulex patent, lasted from 1922 to March, 1924, until the patent was sold—a year and a half.

Q. Were you carrying on that investigation in colloids during that entire time?—*A.* Not at all.

Q. Well, how long did that investigation last?—*A.* Well, a few weeks; probably a few months at the outside.

Q. And what colloids did you investigate?—*A.* Well, the first one which was in use was called by a commercial name.

Q. I do not want the history of it,—if you can list them?—*A.* If I call it by its commercial name that is misleading, but at any rate it is treated with caustic soda and the liquid is absorbed by quick lime, the quick lime acting as the distributor as well as the drying medium for making a dry product. That was the first.

Q. Yes?—*A.* Then we used a blood albumen. We used saponin. We used tannic acid. We used glycerine. I might say that with tannic acid we can include gallic acid, because it was gallic acid that I happened to use.

Q. Were those all you investigated?—*A.* My impression was we investigated a great many, but I do not recall them right on the spur of the moment. If I had time to recall them I would probably recall a good many.

Q. There were a good many, and you finally found one that was useful for the purpose you had in mind?—*A.* Yes.

Q. What one was that?—*A.* We found at that time that those colloids made from hair, or this colloid, rather, made from hair was the cheapest to use, but later that was changed to saponin.

Q. That was changed to saponin later?—*A.* Yes.

Q. When you tried this whipping the albumen, or white of eggs, you tried that with gypsum, I take it?—*A.* Yes, and cement. You mean whipping the foam in?

Q. Yes?—*A.* That was tried with both cement and gypsum, and plaster of paris.

Q. Did you find that it spoiled the strength of the cement, or did you test that?—*A.* The strength of the cement?

Q. Yes, how was that affected by the albumen?—*A.* The foam that I mixed in with the cement gave me a product weighing 20 pounds to the cubic foot instead of the normal weigh of the neat Portland cement.

Q. But as to its strength?—*A.* I do not know anything about the strength. We were after a very solid product. As a matter of fact, my experiments with Portland cement were more of an altruistic character, because my principals were not manufacturers of Portland cement.

Q. Now, when was it that following the investigation in connection with insulex, you substituted the saponin for the other ingredient or the other colloid you mentioned?—*A.* I cannot give you the exact date.

In the Exchequer Court.

Plaintiffs' Evidence.

No. 12. George M. Thomson. Cross-examination—*continued.*

Q. Oh, roughly?—*A.* Oh, the last time when it was mentioned specifically, that they had used saponin in all their products, in all their insulex products, was in February, 1926, but it had been used for a long time before that.

Q. Well, I mean in relation to 1922, was it a year or two years after that or not that they began to use it commercially in the insulex product?—*A.* Well, my impression is that the Ashenhurst interests used the saponin in 1922 in insulex.

Q. You think it was before the end of 1922?—*A.* Yes, I know it was.

Q. And is that the same purified form that the Ontario Gypsum Company used when they came to make it in 1926?—*A.* That was the purified form, as used by manufacturers of confectioneries, differentiating between what the Canada Gypsum uses now in the form of soap bark extract. May I qualify this, Mr. Smart? Saponin is an extract from soap bark, but it is a purified extract.

Q. All I am getting at, first, is, whether it was exactly the same form of extract that was used in connection with insulex and was later used in connection with the Canada Gypsum Company?—*A.* My impression is that the first saponin that was ever used in insulex by the Ashenhurst interests was the purified saponin, as used by confectioners, and the first saponin that I made foam from, and mixed pre-made into a gypsum slurry, was from a purified saponin such as confectioners use.

Q. There was no question that in the development of the insulex, the idea was the development by the Ashenhurst people of the idea of pre-forming the foam?—*A.* No. They used inherent chemicals to generate the gas.

Q. Did you ever get a patent on the pre-formed foam when made with saponin extract? Did you ever get a patent yourself?—*A.* I never applied for one.

Q. Now, has formaldehyde in a mixture any effect on the setting of gypsum?—*A.* The formaldehyde?

Q. Yes.?—*A.* The good gypsum uses it in such minute quantities that it does not affect the setting, but I could not say what would happen if larger amounts were used.

Q. These samples that you produce in Court are quite small blocks. As regards the character of foam required, that is density and stability, if these blocks were of greater height would one require a more tenacious and stronger foam?—*A.* Not necessarily. They would require less foam in the product to have any strength value; the strength in the product is not in the air cells. The strength in a product is in the material, the cementitious material. The more air that you put in a cementitious product the less cementitious material you have left in it, and, therefore, the tensile strength is reduced greatly. It has nothing to do with the strength of the bubble-forming agent. It is the matter of air that you can get into the cementitious mass and retain.

Q. Well, what I was getting at was this, that if one made a block of much greater height than those small samples, one would have to see that

the weight of the material itself did not break down the foam before the material was set; would not there be a greater tendency, when you use a large block of material——?—*A.* When you put air in the form of bubbles in a cementitious mass the air is not expanding. It is put under compression by the surrounding cementitious material which is resting on it. When you put that air under compression it only has its effect until the mass is set. Afterwards it has no effect whatever because the air is lost as soon as the gases were drawn out of the material.

Q. Will you tell me exactly how you make your foam? The Canada Gypsum and Alabastine Company make their foam for those commercial products that you have referred to at the present time?—*A.* I will give that information if it is demanded by the Court.

The Canada Gypsum Company have made very rapid strides in the gypsum industry. As a matter of fact, it is felt that they have made history in the gypsum industry in the last few years. Anything that will tend to reveal discoveries made in the ordinary course of events in the last two years I am not competent to divulge unless ordered to do so.

HIS LORDSHIP: What do you mean by your question, Mr. Smart? I do not want to make anybody divulge commercial secrets if I can avoid it. What do you want to get and what do you mean by your question?

Mr. SMART: How is the foam made in the samples which are produced, that is my question. How was the foam made, and I want an exact description of it.

HIS LORDSHIP: Do you mean the ingredients, the constituents of it? He could tell you generally I suppose.

Mr. SMART: I do not know how much I want until the witness tells me and then I will go further into it.

Mr. HERRIDGE: I submit, my lord, that it has no significance in this case, how these samples were made in 1926, other than that they were made as the witness has already said, in prosecution of these various formulæ which, as he says, have been in commercial use for some time. Anything beyond that question, I submit is, a direct inquiry into the specialized methods which may or may not have been employed by this company, and is asking this witness to give evidence regarding the current practice of the company, which he is not competent to give and which has no relation to this suit.

HIS LORDSHIP: Is there any way by which you can answer the question, in a general way?—*A.* Yes, my lord.

Mr. SMART: If this is common knowledge it should be easy for him to describe. My learned friend says it is a matter of common knowledge the way his foam is made and produced.

HIS LORDSHIP: Well, Mr. Smart, I think we always try to relieve witnesses from disclosing trade secrets, and it would be unfortunate if we had to adopt a contrary practice.

Mr. SMART: But the witness has produced the sample. I only want to know how those samples were made.

In the Exchequer Court.

Plaintiffs' Evidence.

No. 12. George M. Thomson. Cross-examination—*continued.*

HIS LORDSHIP: Well, he has told you that. I suppose he has no objection to telling you that.

WITNESS: Those samples were made from foam produced by whipping up solutions in a bowl with an egg beater. Here is the egg beater from which they were made, or that was used in the making of them.

Mr. SMART: No, but this exhibit No. 8.—*A.* The air is retained, the bubble surfaces are retained by the use of an extract from soap bark. There is the soap bark which was used in the extraction.

Q. Just how is the foam made?—*A.* By a beating action, the exact details of which, the disclosure of which might prove very embarrassing to our patent situation, which I might say, is quite elaborate.

HIS LORDSHIP: By a beating action?—*A.* By a beating or whipping action.

Mr. SMART: Then you have a special beating arrangement by which the foam is made?—*A.* Yes.

Q. And what are the ingredients of the foam?—*A.* The extract of soap bark in water.

Q. Anything else?—*A.* Nothing else, nothing whatever.

Q. And what percentage of soap bark?—*A.* I might answer the question this way: If any › desires to duplicate the feat they can dump 50 pounds of soap bark in 1 gallons of water, if they can get it mixed, and get an extract which is ‹ certain gravity.

Q. Do you imply that they would have some difficulty in doing it?—*A.* They could put ten pounds of soap bark in an equal quantity of water and get an extract from which they could make foam. My lord, in the manufacture, in the fabrication of products we have definite mathematical relations not merely between the foam and the gypsum used, but we have definite mathematical relations between all the constituents and time factors in our fabrication, and a disclosure of the necessary tables used in two or three of those time factors might give information to our competitors, which we do not feel willing to disclose unless compelled to do so.

Q. And those details have entailed a lot of work on your part which you do not want your competitors to get?—*A.* Mr. Smart, they were disclosed in a laboratory, in an operating mill before they were disclosed industrially.

Q. Well, is there not some way, without telling me the process, by which you make this soap bark extract, because I have no interest in going into the business of making this public, but I do want to know the percentage of the ingredients in the foam. Take your foamy mixture, is it water throughout?—*A.* Yes, we call it colloidised water. That would be corrected by a chemist probably, but that is what we call it.

Q. And you add to the water a soap bark extract?—*A.* Yes.

Q. And what percentage of soap bark extract would you add to that water?—*A.* You can make a fifty-fifty solution,—you can get a good foam——

Q. No. but in exhibit 8 what percentage has been added in making this exhibit?

Mr. HERRIDGE: My lord, this is obviously an attempt to ascertain——

HIS LORDSHIP: Never mind, he is quite an able witness and he need not state anything that he thinks is a disclosure which will be injurious to his business. If you suffer by that why it is your own fault.

Mr. SMART: I say the witness is not privileged on the subject at all.

HIS LORDSHIP: Why cannot you confine your examination to the factors which are involved in both patents? I think there is a way. I do not know enough about it to assist you, but I think there ought to be some way by which you can get practically what you want.

Mr. SMART: I am asking a very simple question. I am asking the percentage of soap bark extract.

HIS LORDSHIP: In what respect will the question of percentages of ingredients used in either of the patents in question be of importance?

Mr SMART: It may be very important.

HIS LORDSHIP: How?

Mr. SMART: Some percentages may work and others may not.

HIS LORDSHIP: Of course, if they did not work they would not be used. Both patentees cover everything that there is that could possibly be used.

Mr. SMART: I do not want to argue the case now, my lord, but there is a physical exhibit introduced by my learned friend. I want to know how that physical exhibit is made. I may want to duplicate it to see if it does produce this when made in that way, and my question to the witness now is what percentage of soap bark extract does he use in his foam making mixture.

Q. Let me put it this way: Is it a critical percentage as regards making the foam?—*A.* Not at all. That was not what you asked, Mr. Smart.

Q. I only wanted to know the percentage of the soap bark extract, say in one hundred gallons of water, in making the foamy mixture?—*A.* Well, if you put a pound of soap bark in a gallon of water you would get a standard solution to make foam with.

Q. And one which would be about the same as you are using?—*A.* No, it would be a much stronger foam than we are using.

Q. Well, give me that what you are using?—*A.* No, it would be a much stronger foam than we are using.

Q. Well, give me that what you are using.

HIS LORDSHIP: That is good enough for you, is it not?

WITNESS: You can make a perfect foam, a very, very dense foam. We have learned other things about foam, Mr. Smart, in relation to manufacture that have nothing to do with the aeration of the product. You can use a very heavy liquid extract solution to make a foam, and make just as stable a foam as we have made there.

HIS LORDSHIP: That is, a pound to the gallon?—*A.* A pound of soap bark to a gallon of water would make a very good solution.

Mr. SMART: And what is the weakest you could use?—*A.* I am not prepared to answer that, I do not know.

Q. What is the weakest you have used?—*A.* Soap bark varies in character considerably, just as the action of slippery elm bark produces different results with saliva. There is a variation in the strength of soap

In the Exchequer Court.

Plaintiffs' Evidence.

No. 12. George M. Thomson. Cross-examination—*continued.*

bark, not only from year to year, but from season to season, depending upon the climatic conditions of those South American and Central American countries where it is grown. Depending upon the strength of the soap bark which we purchase on the open market does the strength of the soap bark extract depend which we use commercially. It is not a fixed factor, it is variable. My lord, I have no hesitancy in saying this, that scientists have been working for many many years to obtain an exact method of determining the foamy action of certain vegetable extracts, and, to my knowledge no method has been obtained to date to determine the exact strength of any vegetable extract to be used for foamy purposes. We have approached it in our blundering, commercial way.

Q. In what way?—*A.* A commercial method of determining the relative strength of these soap barks, as we purchase them on the open market. The strength of an extract, the proportion of soap bark to water, depends on the strength of the bark which we purchase on the open market.

Q. And you have conducted a series of experiments to determine that, I suppose?—*A.* Yes.

Q. What is the variation in soap bark extract purchased in the open market?—*A.* It is considerable.

Q. Well, five per cent. to ten per cent. variation, or double, or treble or what?—*A.* In terms of the poorest, the best is probably a thousand times as strong. I might qualify that. That is in terms of purified saponin. We have got saponin that was many times as strong as other saponin, purified, I mean.

Q. Does it go to a thousand or a hundred?—*A.* It is probably an exaggerated statement, but in lieu of definite percentages I cannot give you definite relationships.

Q. Is it not true that any cementitious block would show some loss when viewed through a microscope?—*A.* That is quite true. Portland cement—I must qualify that——

Q. Except Portland cement?—*A.* No, I must qualify that statement. Portland cement does not crystalize out such as gypsum does. Portland cement is composed of particles which swell when wet and contract when dry, for at least five to six years to our knowledge. As those particles dry out they must naturally leave voids between them, and those are the cells which you see under a microscope.

Re-examination.

RE-EXAMINED BY MR. HERRIDGE.

Q. Mr. Thomson, is the percentage of bubble forming agents an essential factor in forming a foam?—*A.* Not at all. We have used foams of various strengths.

Q. All right, thank you. I did not quite understand the purpose of the investigation into those colloids in connection with the insulex business, in 1922. Will you just say what it was in a word or two?—*A.* Do you refer to my own particular investigation?

Q. Yes.—*A.* The object was to determine the best means of holding the bubbles without affecting the time of sets of the gypsum or plaster of paris.

Q. That was with the old insulex product, I take it?—*A.* Yes.

Q. Yes. And which, of course, was on the market for some years at that time?—*A.* It had been available in Chicago for several years.

Q. As a matter of fact, Mr. Thomson, were these investigations necessary to enable you to find a stable colloid to make a premade foam?—*A.* My investigation was not to find more colloids, or unknown colloids. My investigation involved a determination of the influence of known colloids on the setting of plaster of paris.

Mr. HERRIDGE: That is all, thank you.

HIS LORDSHIP: Is that your case, Mr. Herridge?

Mr. HERRIDGE: That is the case, my lord.

(*This witness was re-called—see p.* 92.)

No. 13.

Discussion.

DEFENCE.

Mr. BIGGAR: My lord, before going on with anything else, my friend has put in a certified copy of the Petition and Oath in connection with the Rice patent, and I looked at it this morning; it was on file, and I found that there was an error in it, in a very important respect, in the certified copy, so we obtained a second certified copy, which I have got to-day. The error was in this, my lord, that in the Affidavit of Rice in the Oath the file copy read:

> "I have made an application in no foreign country except as follows: The United States of America, application filed December 21, 1922, serial number 608,349."

In other words, the U.S. application was not stated. That was a pure mistake, and it should read "United States of America, application filed December 21st, serial No. so and so," and I suggest that that be substituted.

HIS LORDSHIP: Can you read it in in the other one?

Mr. BIGGAR: I have got another one. We can substitute the one for the other. The point is of importance, my lord, because as I fancy my friend will agree, both the United States and Canada are parties to the International Convention, and as the application for our patent was made within a year from the coming into force of the Patent Act in 1923, on the 1st of September, 1923, we are entitled to the benefit of our United States date as our date of invention.

HIS LORDSHIP: What is the admission you require? I suppose there is no difficulty about that, that is, Canada and the United States are parties to the International Convention.

In the Exchequer Court.

No. 13. Discussion, 7th December 1928 *—continued.*

Mr. BIGGAR: Yes, my lord.

HIS LORDSHIP: I suppose you will agree to that, Mr. Herridge.

Mr. HERRIDGE: My lord, these copies are both certified copies. They are both under the seal of the Patent Office. They are responsible for issuing one wrong certificate.

Mr. BIGGAR: We can straighten that up to-morrow, my lord. The point is that as long as it is understood that we do not need to give any evidence to prove——

HIS LORDSHIP: Mr. Herridge, you agree that Canada and the United States are parties to the International Convention.

Mr. HERRIDGE: Of course, my lord.

HIS LORDSHIP: That is to be found in treaties.

Mr. HERRIDGE: We are not disputing that, my lord.

Mr. BIGGAR: I do not think there will be any difficulty about it.

HIS LORDSHIP: At any rate, that is settled.

Mr. BIGGAR: It follows, therefore, that having regard to our U.S. date of application we are entitled to that date as the date of the invention.

HIS LORDSHIP: I do not remember that we have ever had to prove that.

Mr. SMART: We had in one case, my lord.

Mr. HERRIDGE: We would never have asked them to do that, my lord.

HIS LORDSHIP: How many witnesses have you, Mr. Biggar?

Mr. BIGGAR: We will have either one or two, my lord.

HIS LORDSHIP: Will you be able to finish your evidence in the afternoon probably?

Mr. SMART: Yes, I do not think, my lord, we will have any difficulty in finishing.

HIS LORDSHIP: We will have the afternoon to argue the case.

Mr. SMART: Yes, my lord.

HIS LORDSHIP: Will it be sufficiently early if we say 10.30 or 10.45? Is that satisfactory? Sometimes it is convenient to members of the bar as well as to those upon the bench to have a little time in the morning.

Mr. BIGGAR: I think 10.30 will be quite all right, my lord.

Court adjourned at 4.30 p.m., Thursday, 6th December, 1928, to resume on Friday, 7th December, 1928, at 10.30 a.m.

Friday, 7th December, 1928, 10.30 a.m.

Mr. BIGGAR: I do not know whether your Lordship would think it useful, but I shall indicate the nature of the position taken by the defendant.

Your lordship sees that it is common ground between the parties that a method of mixing bubbles with cementitious material, for the purpose of producing a porous concrete, is an invention. That is common ground, and what the Plaintiff is asking is that Rice's patent for a process of doing that should be set aside, and that it should be set aside only on one ground, namely, that the method as proposed by Rice in his patent for this purpose had been anticipated by the invention made by Bayer.

Now, that is not to say, as your lordship observed in another action of this kind, that there may be some one or more claims of Rice's patent which may possibly have been anticipated. He must establish that the patent granted to Rice is bad because there is nothing in it that Bayer had not done —the patent granted to Rice is invalid because there is nothing in it that Bayer had not done.

The whole patent must fall. His action is an action to set aside the whole, that it should not have issued because of the anticipation by Bayer.

In order to do that he has got to prove two things. He has got to prove, in the first place, that Bayer made an invention, and, in the second place, that Bayer made the same invention as is described by Rice.

Our answer to him rests on four different grounds.

In the first place, we say that Bayer made no invention at all, and that he has not shown that he made any invention at all. That is to say, that his evidence would, if the case stood now, not entitled him to success, because he has found nothing in the way of an invention. Perhaps I had better develop that just parenthetically. There are, of course, two things, the inventive idea, and a method for releasing that inventive idea.

Granting, for the purpose of argument, that Bayer had an inventive idea at all, there is no evidence that he suggested any means of releasing that inventive idea, and that, therefore, there was in the legal or statutory sense no invention at all, and that, therefore, the field was completely clear for Rice, and it does not matter at all whether anything whatever was common to the two in the way of an idea, because the only invention that is before your lordship is the invention of Rice.

Then we say first, that there is no evidence on the part of the Plaintiff that Bayer had an invention at all in the statutory or legal sense, and that, therefore, he could not possibly anticipate the invention of Rice.

Then we say next—and it is on this point, and on this point only, that we propose to adduce evidence—that the first Bayer specification is definitely misleading, that he did not suggest any possible means of realizing the inventive idea. On that point we are going to give evidence. We are going to show your lordship that the materials with which Bayer said that his result could be obtained could not, and did not, produce the result at all.

Then, in addition to those two grounds—on one of which we are proposing to adduce evidence—we have two other grounds upon which we defend and say that the Rice patent can not be set aside, and the first of those is that Rice made a completely different suggestion from Bayer, a specific suggestion as to a method in respect of which he is entitled to his patent. He suggested the use of a particular kind of material, and material in a particular solution, and so on, with particular proportions, and that there is nothing in the evidence on the part of the Plaintiffs that would entitle them to set aside the patent on that ground.

And lastly we say that whatever may be the position with regard to Bayer, whatever Bayer may have done, and whatever the evidence may indicate that he attained in the way of results, still we are entitled to our patent because we were the first to disclose the invention to the public.

In the Exchequer Court.

No. 13. Discussion, 7th December 1928 —*continued.*

We were the first to apply for a patent in Canada, and that, therefore, we are entitled to our patent.

HIS LORDSHIP: When did Bayer apply?

Mr. BIGGAR: Bayer applied, my lord, in 1926. I will give your lordship the date. The application was 1924, December 6th, 1924. Bayer's Danish patent was published on the 2nd of July, 1923. Your lordship will remember that our application in the United States was made on December 21st, 1922.

Mr. HERRIDGE: The filing date in Denmark was June.

Mr. SMART: September 11th, 1922.

Mr. BIGGAR: So that if your lordship wants to make a note of those dates I can give them to you consecutively:—

Bayer's Danish application, September 11th, 1922.
Rice's U.S. Application, December 21st, 1922.
Bayer's Danish patent issued 2nd July, 1923.
Rice filed in Canada on the 13th of June, 1924.
Bayer filed in Canada on December 6th, 1924.
Rice patent issued on August 11th, 1925.
Bayer's patent issued on November 9th, 1926.

So that your lordship sees that the effective date, the effective earlier date, is December 21st, 1922, which, in the absence of evidence, would be the earliest date of either of them in Canada.

Then the evidence we shall adduce, my lord, is only on the one defence, and I am going to call Doctor Jerome Alexander.

Defendant's Evidence.

No. 14. Jerome Alexander. Examination.

No. 14.

Evidence of Jerome Alexander.

JEROME ALEXANDER Sworn. Examined by Mr. BIGGAR.

Mr. BIGGAR: I presume, my lord, that I may lead the witness with regard to his qualifications.

HIS LORDSHIP: Certainly.

Mr. BIGGAR: Dr. Alexander, you are a consulting chemist and chemical engineer?—*A.* I am.

Q. And you reside in New York?—*A.* I live in New York City.

Q. And you have practiced as a consulting chemist and chemical engineer in New York for how long?—*A.* Well, independently, for about 6 years.

Q. And you are a bachelor of science?—*A.* Master of science.

Q. Both the same universities?—*A.* Both the same colleges.

Q. And that college was?—*A.* The College of the State of New York.

Q. And you have, I understand, been for 25 years treasurer and chief chemist to a number of allied associated manufacturing companies which made glues, gelatines and starch products, and so on?—*A.* That is correct.

Q. And have had charge of their chemical work?—*A.* Yes.

Q. And can you name the companies that are associated for whom you act?—*A.* Yes. The National Gum and Mecca Co.; The National Glue and Gelatine Works; The Crossan Colour and Chemical Co.; The Colloid Company; and there were a number of other subsidiary companies.

Q. And I understand that you have the distinction of being one of the hundred and seventy-five chemists in the United States who are starred in the publication American Men of Science who have special distinction? —*A.* That is so.

Q. And you are, I understand, also the author and editor of a number of books on colloid chemistry?—*A.* That is correct.

Q. You wrote a book called 'Colloid Chemistry' that is now in its third edition?—*A.* Well, I am preparing the third edition.

Q. And you are also the author of "Glue and Gelatine," published by the American Chemical Society?—*A.* Right.

Q. And you translated Zoigmondy's Colloids; he is one of the most distinguished chemists who is dealing with that kind of subject?—*A* A couple of years ago he received the Nobel prize for this work.

Q. Then you are also the editor of a book called Colloid Chemistry Theoretical and Applied?—*A.* I am, and a contributor to the book as well.

Q. And you, as a matter of fact, were the originator, I mean, you took the responsibility of collecting the material for the book?—*A.* Quite so.

Q. From a large number of scientists all over the world?—*A.* That is correct.

Q. And I understand that only the first volume of three has yet been published?—*A.* Well, the second volume is out to-morrow I think. The publisher promised me that he would have the second volume out to-morrow.

Q. And you have a large number of very distinguished contributors to that, including some four or five men who have received the Nobel prize?—*A.* The first volume has six papers in it by winners of the Nobel prize. The second volume has two papers in it by winners of the Nobel prize.

Q. And you have also contributed to a large number of scientific publications on subjects connected with your particular specialty?—*A.* Yes.

Q. And you are a lecturer at a number of institutions—Columbia University, University of Cincinnati and so on?—*A.* Yes, have been repeatedly asked to lecture. I have lectured here in Ontario, in Toronto and Queen's University of Kingston, also McGill University of Montreal. In fact I am scheduled to deliver two lectures at McGill University next March.

Q. And during the war, from 1917 to 1919, you were Chairman of the National Research Council sub-Committee on glue and other gelatines?—*A.* I was.

Q. And you are a Fellow of the American Association for the Advancement of Science, and the American Institution of Chemists?—*A.* I am.

Q. And a member of a large number of learned societies?—*A.* I am.

In the Exchequer Court.

Defendant's Evidence.

No. 14. Jerome Alexander. Examination—*continued.*

Q. Now just to indicate the relevance, indicate what a colloid is?—*A.* Well, the word " Colloid " was devised by a Scotchman, Thomas Graham, who was Master of the Mint in England, about the year 1860, or 1861. Graham made a great many experiments with glue-like substances, including albumen, starch, and a number of other similar things, and found out that they had different characteristics from things like salt and sugar and lime, which would crystalize, and he devised the word " colloid " which literally means glue-like from the French word coll, or from the Greek word Kolle, so the original meaning of colloid was glue-like.

Q. And sizes and varnishes, and that sort of thing, with which you had to deal, I mean from a commercial point of view, are all colloids?—*A.* All of those things, yes.

Q. The characteristic colloids being?—*A.* Glue, gelatine, starch, and albumen. Later on it came to be understood that any substance whatsoever could be produced in a colloidal condition, as Graham had himself intimated——

Q. But the characteristic colloids were these glue-like substances?—*A.* Right.

Q. Now, you were asked to read and familiarize yourself with the Bayer patent that is in question here?—*A.* I did.

Q. Was it the Canadian or the Danish patent that you were furnished with?—*A.* Well I had the Canadian patent.

HIS LORDSHIP: Just a moment. I would like the Bayer Canadian patent exhibit No. 2.

Mr. BIGGAR: As a matter of fact, I understand, my lord, from what my friend states at the time he put it in that the patent was attached to it. There was a change made in some exhibit yesterday.

Mr. HERRIDGE: This is a copy of the specification and claims which are with the other.

THE REGISTRAR: I marked it, my lord. Here it is, Exhibit No. 1, part 2.

Mr. BIGGAR: There is nothing wrong about that. Bayer's Canadian patent was marked Exhibit 2, and is so recorded.

Mr. SMART: It should be substituted then.

Mr. BIGGAR: Your Lordship will remember that at the time my learned friend handed that in I said to him, Is that in the record file, and my friend said the patent forms part of the file.

Mr. SMART: I think this document which my learned friend has produced should be substituted for Exhibit No. 2.

HIS LORDSHIP: Well it had better be substituted anyway whether you put the other in or not.

Mr. SMART: Old No. 2 is identical with Exhibit A. (Bayer Canadian patent No. 265,601, filed as new Exhibit No. 2.).

HIS LORDSHIP: One of the others had better be removed.

THE REGISTRAR: I will hand it back, my lord, to counsel for the plaintiff.

Mr. HERRIDGE: We will leave that in. This is part of the Court record which we filed when we instituted the action.

Mr. SMART: Oh, no. My learned friend filed the Rice application when he instituted the action. If my learned friend will look at Exhibit A he will see that word for word and document for document they are the same.

HIS LORDSHIP: If these two other documents are the same exactly there is no reason for filing them both. You can proceed.

Mr. BIGGAR: And when you looked at this Bayer patent, Dr. Alexander, you found the word 'mucilage' in it. What is a mucilage?—*A.* Well, to my mind a mucilage is a viscous aqueous solution made from a vegetable gum, such as the mucilage of gum arabic and gum tragacanth, a mucilage of Irish moss or something of that kind.

Q. You mentioned I think another?—*A.* Yes, gum karaya.

Q. And of those are any of them products of the sea?—*A.* Yes. Mucilage of Irish moss is made by taking the common commercial sea-weed known as Irish moss, the scientific name of which is Chondrus crispus, and boiling it up with water and then straining it. That is commonly used in pharmacy, by the way.

Q. And is it a common product?—*A.* Quite a common product. It is largely used commercially as well as in pharmacy. In fact, I bought my sample of it at a drug store.

Q. And is that the only one of the ones that you have mentioned that is a sea product?—*A.* Yes, that is the only one.

Q. Are there other mucilages made out of sea products in commercial use?—*A.* Well, I understand that in recent years the Hercules Powder Company are making a trade product from some California sea-weeds. They were led into the business during the War, in order to get potash from the sea-weeds.

Q. But the Irish moss is a common one?—*A.* Yes, Irish moss is a common one. I have never used the Hercules product, but I understand it is on the market.

Q. For the purpose to which the Bayer patent was directed, do you think there is any choice as between these various sources of mucilage?—*A.* Well, I think that I could find out enough by experiment, I do not know.

Q. From your general knowledge, would there be any reason to choose any one of them as against the other?—*A.* Well I should think that Irish moss, on account of the fact that it is what is technically termed rather a long mucilage would be better than tragacanth or karaya mucilage. They are more pasty and would be more apt to form an inherent foam than would tragacanth or gum karaya mucilage. They are rather brittle and short. Technically they are termed short. The other would be long. It would tend to string out.

Q. What about gum arabic?—*A.* Well, in order to get a long solution from gum arabic, you would have to use a high percentage of gum, probably over 5 per cent., and the cost would be prohibitive in my opinion.

In the Exchequer Court.

Defendant's Evidence.

No. 14. Jerome Alexander. Examination—*continued.*

Q. What would you say then as to the choice then of Irish moss as a fair mucilage to test the workability of the Bayer patent?—*A.* I think it would be the best of any I have mentioned.

Q. In the course of your work as a chemist have you had to do with foam-producing materials?—*A.* Why yes, I have had a great deal to do with things which would produce foam, although for the most part my efforts were directed——

Q. I mean, you have had to do with foam-making materials?—*A.* On things that could produce foam, yes.

Q. So that, speaking generally, you had some familiarity with what causes foam, and the nature of the various materials produced therefrom?—*A.* Oh, yes.

Q. Now, having made this selection of Irish moss, what did you do for the purpose of testing the results to be obtained by it?—*A.* Well, I looked over the Bayer patent and found no specific directions as to what to do, so I realized that I would have to undertake experiments to find out just how to go about accomplishing and bringing into effect the idea which Bayer invented. I therefore, made a preliminary solution of Irish moss, of five per cent., that is, really it was five parts by weight of Irish moss to 100 parts of water, which is slightly different from 5 per cent. but practically it is called a 5 per cent. solution. You see, it is 5 plus 100 instead of 5 in 100. Practical men call that 5 per cent. It is really 5 and 105.

Q. Yes, and what was the nature of the resulting material?—*A.* Well, that solution was obviously too thick to make a foam at all. It was exceedingly viscid and could hardly be stirred.

Q. And so what was your next step?—*A.* I diluted that solution with an equal quantity of water, making the solution 5 parts of Irish moss and 200 parts of water, which is substantially a 2½ per cent. solution, and that solution was fluid enough for me to beat up into a foam.

Q. And how did you beat it?—*A.* With this apparatus, a common egg beater and a cup in which the beater fits rather closely.

Q. Speaking generally, with regard to the nature of this Irish moss solution and the method of beating, what do you say as to there being any better, or probably better method of beating your preparation of solution to produce the amount of foam that is suggested by Bayer?—*A.* Well, in the first place, I think this particular type of apparatus is a highly efficient apparatus for operations on a small scale. It proved thus to be in actual practice. It is the apparatus commonly used in whipping cream and beating the whites of eggs to a froth to make floating island, and similar things in the kitchen.

Q. And what about the appropriateness of the 2½ per cent. solution which you beat up with it?—*A.* Well, of course, I do not know anything about that. I had to find out just how the 2½ per cent. solution would work.

Q. Well, speaking generally, what do you say as to any other solution being likely to give any better result?—*A.* From the appearance of the 2½ per cent. solution it seemed quite viscous, and I thought it would give a

good foam, and it actually did give a good foam in this apparatus. The whole solution beat up into a foam leaving substantially none of the liquid solution at the bottom. In other words, it made a very complete foam.

Q. Now, having got this foam, what was your next step?—*A.* I then made a preliminary experiment to find out how much fluid I would have to mix with the particular cement, Portland cement and plaster of paris, which I was going to experiment with, because I did not know exactly how much those particular samples of plaster of paris and Portland cement would take, and by referring to the notes which I made at the time I found out that I could properly moisten the particular plaster of paris which I was working with by taking 100 grams of plaster of paris and 60 cubic centimeters, or 60 grams of water. In the case of the cement I could not use that much water. I had to work in the proportion of 100 parts of Portland cement to 50 parts of water. Then in order to mix my foam with the cement in the same proportions I took in the one case with the plaster, I took 60 cubic centimeters and the Irish moss 2½ per cent. solution, beat that to a foam, and mixed it into 100 grams of plaster of paris. In like manner I proceeded with the Portland cement, only in that case I used 50 cubic centimeters and the 2½ per cent. Irish moss solution.

Q. Well, now, did you make any test testings of plaster of paris and cement independently of any foam?—*A.* Yes. Those were my comparison standards.

Q. Have you got the results of those experiments here?—*A.* I have them right here.

Q. Now, this example No. 1 is the plain plaster of paris?—*A.* With pure water.

Q. And No. 5 is the corresponding sample with cement?—*A.* That is right.

Q. These samples are labelled to indicate the nature of the mix?—*A.* Each sample is labelled to indicate the nature of the mix, it being understood that when I say 2½ per cent. I mean 5 parts plus 200 and not 5 parts in 200. It is a little bit confusing because practical men class that a 2½ per cent. solution.

Q. These two samples, 1 and 5, are solid cement on plaster of paris without any more voids in them than is usual in the ordinary practice?—*A.* Yes.

Q. There are no bubbles?—*A.* Unless they are there by chance.

Q. Exactly, but I mean this is ordinary, normal cement, and plaster?—*A.* Ordinary normal cement and plaster.

Q. Now your first experiment with your foam solution are the glasses numbered 2 and 6 are they not?—*A.* They are.

Q. And you have described the result, the mixes that you made for the purpose of producing these?—*A.* Yes.

Q. In mixing the foam with the cement and plaster of paris, did you or did you not take steps to avoid any unnecessary breaking of the bubbles of the foam?—*A.* In all cases, in mixing foam with these samples I mixed as carefully as I could to make the aqueous solution wet the plaster of paris

In the Exchequer Court.

Defendant's Evidence.

No. 14. Jerome Alexander. Examination—*continued.*

and the cement respectively, as completely as possible, and with as little breaking down of bubbles as I could.

Q. What was your general intention in making those experiments?—*A.* My general intention was, to make, if possible, a cellular or foamy cement according to Bayer's idea.

Q. And you took every step that you could to secure that result?—*A.* In those experiments.

Q. In comparing the glasses 2 and 6 with the glasses 5 and 1, what was the most convenient way of doing it, to make the comparison?—*A.* Well, by comparing their relative volume, because if 2 and 6 had been puffed up or leavened by air bubbles they would get a greater volume, the total masses or weights of material, being in each case identical, and the glasses being substantially identical.

Q. Is that true of all the remainder of the glasses that you have before you?—*A.* It is.

Q. That the comparative space occupied, finally occupied by the set mixture, can be compared, because the initial volumes were the same?—*A.* Yes, always remembering that you have to compare plaster against plaster and cement against cement, because the proportions are different in the two.

Mr. BIGGAR: Exactly. Your Lordship will observe that there is practically no difference in volume between 2 and 6, and 1 and 5.

Q. Your next experiment, Dr. Alexander, differed from the last, that is to say, the one represented by 2 and 6, in what way?—*A.* Well, when I saw that I got an unsuccessful result with this 2½ per cent. mixture, I thought the next step would be to try a weaker mixture. Perhaps the film was too brittle or something or other. So I reduced the percentage to 1 per cent. of Irish moss.

Q. Maintaining the other proportions?—*A.* Maintaining the other proportions the same.

Q. And the samples numbered 3 and 7 represent the results that you obtained?—*A.* They do.

Q. With plaster of paris and cement, respectively?—*A.* Yes. I may say that I got a foam with the one per cent. solution, although it was not quite as good a foam, as far as I could see. It did not foam up quite so easily as the 2½ per cent. solution.

Q. Your next experiments were those represented by the glasses 4 and 8, were they not?—*A.* Yes.

Q. And those differed from 3 and 7 in what way?—*A.* Well, I still further reduced the percentage of Irish moss, since very small percentages were indicated in the patent, and these solutions did not foam well at all. They gave foam. The percentage of Irish moss was about one-quarter of one per cent.

Q. They are all marked. It is a quarter of one per cent. in 4 and 8?—*A.* Yes. I have my records by weights, and I have simply figured this into percentage for the convenience of the Court, that is all.

Q. And you got no different results, so far as a cellular cement or plaster of paris was concerned?—*A.* None at all. Of course, the difference in the viscosity of the solutions was restricted in the way the things mixed up. The more viscous solutions naturally made the mixing more difficult, because the thicker the solution the more resistance there is.

Q. Speaking from your general knowledge, what would you say that those experiments led to by way of conclusion, with respect to the use of Irish moss?—*A.* Well, that Bayer did not disclose in his patent how to make an effective product.

Q. Well, I mean, does any way of effectively doing it with this material suggest itself to you?—*A.* No. I do not know what might happen if I carried on with those experiments. No one can tell that; but I know all of these experiments, which were made in absolute good faith, in an attempt to operate the Bayer patent, and not one of them was successful.

Q. Speaking from your general knowledge, have you or have you not any reason to suppose that any other mucilage would operate any better?—*A.* Oh, no, I should think not; that is the straight mucilage. What would happen if you mix other things with it or did other things to it, is a question which would have to be proven by experiment, but as a matter of general knowledge, no, I would not know what to do. I would have to experiment to find out what to do.

Q. One of the suggestions made in the patent with regard to mixing other materials is a mixture of gelatine with the seaweed. Did you make any experiment on that line?—*A.* I did.

His Lordship: Would Irish moss come within the definition of tangin or sea-tang?—*A.* Tang, being a seaweed, Irish moss being a seaweed, of course, it would come under that rule. In this country we use the term "algin." That is the more commonly used term, because seaweeds are sea algae, and this "in" simply means a derivative, or just a little word put on to indicate that the material came from an algae.

Mr. Biggar: You made some experiments with regard to the mixture of gelatine?—*A.* I did. Since there were no percentages of any account given in the Bayer patent, I had to guess at my own percentages, and I made up my first experiment, in glass No. 11, as follows: 100 parts of plaster, 10 parts of a 2 per cent. gelatine solution, 40 parts of the 2 per cent. Irish moss solution, and 10 parts of water, which figures out as follows: one-third of one per cent. gelatine and one and two-thirds per cent. Irish moss, all the percentages being based on the aqueous solution used and not on the total mass of the finished product.

Q. And what were the results?—*A.* Well, in glass No. 11 the result was negative, entirely negative. Glass No. 12 was made different. When I saw I had not got a good result in glass No. 11 I changed the proportions somewhat, and in glass No. 12 that was made up of 100 parts of cement, 20 parts of 2 per cent. gelatine, 20 parts of 2½ per cent. Irish moss, and 10 parts of water.

In the Exchequer Court.

Defendant's Evidence.

No. 14. Jerome Alexander. Examination—*continued.*

Q. That makes?—*A.* That makes the following percentages in the aqueous solution, four-fifths of one per cent. gelatine and one per cent. Irish moss.

Q. And you get the result that is shown in glass No. 12?—*A.* Yes.

Q. It has a slightly greater volume than that shown in glass No. 1?—*A.* Glass No. 12 is the one that shows any real semblance of having any leavening action of the froth, but there we had a very sharp percentage of gelatine, almost one per cent.

Q. And from your other experiments, generally, to what do you attribute the slight increase in volume there?—*A.* Oh, primarily to the gelatine.

Q. Gelatine. I do not think we have defined that expression. Is it an animal substance?—*A.* Gelatine is an animal substance. By gelatine it is generally understood a high test or high jell strength, namely, glue, usually of light colour.

Q. These mucilages that you have referred to, what are they? Are they protein or carbohydrates?—*A.* Oh, carbohydrates. All the vegetable gums are carbohydrates.

Q. And the gelatine, what is that?—*A.* That is a protein.

Q. Now, just to complete the Bayer patent, what would be the effect of adding formaldehyde to any of these solutions that you have?—*A.* Well, the effect of formaldehyde on the vegetable gums is that of an antiseptic or preservative. It prevents the growth of bacteria or moulds which tend to break down or destroy the vegetable gum solutions. In the case of gelatine there are two effects. In the first place, formaldehyde will act as an antiseptic in gelatine solutions, but it also has the power of toughening or hardening gelatine solutions, the actual effect of the formaldehyde depending very greatly upon how much of the formaldehyde is used.

Q. Does this hardening or toughening effect occur in an Irish moss or carbohydrate solution at all?—*A.* No. The action of formaldehyde would simply be that of a preservative, whereas in the case of gelatine the action of the formaldehyde, in addition to being a preservative, is to add as a toughener.

Q. What would you say then with regard to the accuracy of the statement in the patent, that in certain cases further durability of the foam has been obtained by adding a small portion of formaldehyde, when that statement is applied to a foam-producing solution made of mucilage, either mucilage generally or Irish moss in particular?—*A.* I would say it is inaccurate. There is only one way in which the formaldehyde might have any effect, and that would be this, that if you made up a solution of Irish moss and allowed it to lie around under such conditions that it would decompose, and then made up at the same time another solution containing formaldehyde, a sufficient quantity to preserve the Irish moss against the inroads of bacteria, and so forth, then the decomposed Irish moss solution would not make a foam comparable with the undecomposed one, but otherwise the effect of formaldehyde would be nothing.

Q. So that with regard to the truth of that statement that it added to the durability, and as applied to this kind of foam-producing material, what would you say as to the statement?—*A.* Well it is not true.

Q. Now, going on to your other experiments. You were advised that it was suggested that foam could be produced for the purpose in hand with soap?—*A.* Yes.

Q. And did you make any experiments on that?—*A.* I did. I made two tests on that, glasses 9 and 10.

Q. Yes. These are still the same volumes of cement and plaster of paris, are they?—*A.* Yes. The soap used was a one per cent. solution of ivory soap. In both cases the results were negative.

Q. Perhaps you had better give me the rest of the ingredients?—*A.* Glass No. 9, 100 parts of cement, 50 parts of a one per cent. solution of ivory soap. Glass No. 10, 100 parts of plaster of paris, 50 parts of a one per cent. solution of ivory soap. And then I had to add ten parts of water to that because it was too thick to mix. I immediately put in the ten parts of water.

Q. And the results that you got were?—*A.* They speak for themselves. They are negative in both cases.

Mr. BIGGAR: In view of one of the statements by one of the witnesses, my lord, and to complete Dr. Alexander's evidence, I am going to ask him with regard to some experiments that he made with Rice's formulae. Of course it is not, strictly speaking, relevant, because the Rice patent is not in question except on the point of being anticipated; but the witness MacRae, you will remember, said that he had tried it, and as Dr. Alexander has made these experiments I want to prove them just for that purpose, to remove any possible misconception on that point, not because they are material.

Q. You made some experiments with the formulae given in Rice's patent, did you not?—*A.* I did.

Q. Those experiments were made at the same time as the others?—*A.* They were. Well, within a day or so. I worked steadily at them.

Q. Perhaps you might tell me when all these experiments were made?—*A.* Well, I started in this work on November 26th, 1928, and worked November 26th, 27th and 28th.

Q. Yes, and these Rice experiments were made on November 28th?—*A.* Partially. They had to go over from the 27th to the 28th, because Rice's prescription, calls for an ageing of certain of his solution about 24 hours, and consequently the solution had to age.

Q. Will you indicate what formulae were given that you used for the purpose of producing these other results?—*A.* Well, I took a copy of Rice's patent, which I had, and exactly followed his first formula there given. I prepared a mixture, as per Rice's patent, as follows: 98·8 per cent. of water, 1 per cent. gelatine, and two-tenths of one per cent. formaldehyde.

Q. Yes, and what about the quantities of plaster of paris and cement?—*A.* Well, I used the same proportions as I had used in the preceding experiments, namely 100 parts of plaster and 60 parts of gelatine solution,

In the Exchequer Court.

Defendant's Evidence.

No. 14. Jerome Alexander. Examination—*continued.*

and 100 parts of cement, and 50 parts of gelatine solution. As per Rice's prescription, I allowed his solution to age from ten minutes after three on November 27th to twenty minutes after one on November 28th, which was a little over 22 hours. His prescription calls for 24 hours.

Q. And then you mixed them?—*A.* Then I mixed them exactly under the same conditions, and in the same manner, as I had the other tests, made under the Bayer patent.

Q. And the results that you got are indicated in glasses Nos. 13, 14, 15 and 16. I am only talking now of 13 and 14?—*A.* Yes, 13 and 14 show the results; they were obviously successful.

Mr. HERRIDGE: I shall ask my friend to remove all the contents from the glasses so that they can be properly examined. You cannot properly examine material such as that in a glass, my lord, when the object of the examination is to determine porosity.

HIS LORDSHIP: I do not understand you, Mr. Herridge.

Mr. HERRIDGE: I shall ask my friend to take these materials out of the glasses. Obviously, my lord, you cannot look through a glass and determine porosity, because on the outside it becomes glazed and destroys the porosity. The pores, in other words, are run into the structure. That is the reason why we broke our samples.

HIS LORDSHIP: I suppose those are intended to prove the porosity.

Mr. BIGGAR: Is there any difficulty in telling the proportion of voids?—*A.* There is absolutely no difficulty whatsoever, because if the sample were leavened it would occupy a greater volume, the total mass being the same. You can judge, for example, roughly, the porosity of a loaf of bread by seeing how well the bread has risen. If the bread does not rise at all it occupies a small volume, and if the bread has risen it occupies a high volume, if you have the same ingredients in the loaf; no question about that.

Q. Exactly. Now, you made two additional ones. Will you indicate the difference between those which are numbered 15 and 16 and those numbered 13 and 14?—*A.* Well, glasses 15 and 16 are the same as 14 and 13, except that I did not add any formaldehyde to the gelatine and did not age the gelatine. Glass 15 consists of 100 parts of plaster and 60 parts of one per cent. gelatine solution. Glass No. 16 consists of 100 parts of Portland cement and 50 parts of gelatine solution. Both of these gave obviously good results, but in the case of the cement it was not as good as with the addition of formaldehyde.

HIS LORDSHIP: Mr. Biggar, you do not say that Bayer could not make a good material himself, or anybody else who knew the exact proportions, the proper proportions to use?

Mr. BIGGAR: No, my lord, but with the things given by Rice, which I am coming to, it is perfectly simple to do.

Q. Now, Dr. Alexander, these 16 glasses that are there, do they or do they not represent all the experiments that you made?—*A.* They represent every single one of the experiments I made. I have left nothing out.

Q. What would you say, Dr. Alexander, with regard to your having followed the instructions in the patent on the subject of using inconsiderable quantities of gelatine and small portions of formaldehyde?—*A.* You refer to the Bayer patent?

Q. Yes.—*A.* Well, I used quantities which I thought would match in with that language. Of course that is, I suppose, to a large extent, a matter of opinion of what you consider an inconsiderable quantity, but having had experience with Irish moss and with gelatine I thought that the quantities used would be those that would be best calculated to give me an equivalent result, if a successful result were possible. In other words, I acted in good faith. I honestly tried to make the Bayer patent work, and I did not use additions or proportions which I thought would not work. I chose the ones that I thought would be most likely to operate.

Cross-examination.

CROSS-EXAMINED BY MR. HERRIDGE.

Q. Is your experience, Dr. Alexander, in patent cases as extensive as your experience in authorship?—*A.* Well, I should say it perhaps is. You will first have to tell me how you measured those two quantities.

Q. Well, you are an old hand at giving expert evidence?—*A.* I am not an old hand at giving expert evidence.

Q. Have you given expert evidence in cases before?—*A.* I have. During the 25 years when I was engaged in actual business I did not give expert evidence at all except as a courtesy to friends. I did it on several occasions where attorneys particularly asked me, but since I have entered consulting practice afterwards I have given evidence on several cases.

Q. Now, in the course of your activities, in your capacity of consultant to the various companies which you have named, have you had occasion to make a study, or conduct any practical experiments in the making of cementitious materials?—*A.* Yes.

Q. What was your experience?—*A.* Why, we used to make up all kinds of special things for various industries like, for example, cements which were used in stiffening the toes of shoes. There are a large number of specialties in the textile shoe manufacture, and various other industries which we used to manufacture, a very large number of specialities. In fact, if you extend the word cementitious to include glue——

Q. I am not extending it necessarily to include glue. I am confining it to the cementitious materials which are under discussion here?—*A.* No, oh no, I did not operate especially with Portland cement and plaster of paris; no I did not.

Q. I understand then that you have had no practical experience with Portland cement?—*A.* I have used Portland cement and plaster of paris on a large scale, but I have not tried to produce anything of this kind before.

Q. And you were never engaged in the manufacture of substances?—*A.* I never made wall boards, or Portland cement blocks, or anything of that kind.

In the Exchequer Court.

Defendant's Evidence.

No. 14.
Jerome Alexander.
Cross-examination—*continued.*

Q. Have you had much experience in the hydration of cement and gypsum, and materials of that nature?—*A.* Why, yes. If you look in the Journal of the Society of Chemical Industry for 1910, you will find a report of experiments that I made with plaster of paris then.

Q. What did you do then?—*A.* I made experiments to determine the effect of the so-called retarders in plaster of paris, the kind of trouble that your friend Thomson had.

Q. You mean one of the Plaintiff's witnesses?—*A.* Yes, had apparently with gelatine. You see, when gelatine is added to plaster of paris, a plaster of paris which will ordinarily set within a certain time, the setting time is very very much increased. I happen to have copies of these results here, and it might be very instructive to put them in the record.

Q. Well, I do not think that is necessary?—*A.* Well if you don't want them in——

Q. I am asking you a definite question, and you say you did have that experience?—*A.* Oh, yes, I had it.

Q. How does it come about that you did not know when you conducted those experiments, which are marked as a series of exhibits in this case, how much water was required to hydrate either your plaster of paris or your cement with which you made these experiments?—*A.* Well, I guessed very closely with these particular samples the first time. I had to find out exactly how the particular samples——

Q. That is not an answer to my question. How did you determine the quantities?—*A.* I had used plaster of paris and cement before, and knowing about how much water one would put to such a thing——

Q. And how much did you put in?—*A.* In the case of plaster of paris, 60 parts of water to 100 parts of plaster of paris. That was quite sufficient to make an easily stirrable mass for this particular plaster of paris.

Q. And it gave you a negative result?—*A.* Quite.

Q. Did you try hydrating the plaster of paris with a greater amount of water?—*A.* No.

Q. Although you did not get a result from the first experiment?—*A.* No, I did not see that that was necessary. As a matter of fact I got the result. I got a perfect result using exactly the same preparation on Rice's specification.

Q. I will come to that in a moment?—*A.* Well, I have come to it now.

Q. Now, I understand, Dr. Alexander, that in these various experiments which you made you had an almost uniform success in producing a foam from the substances which you used for that purpose, do I understand you correctly?—*A.* With the exception of the one-quarter of one per cent. Irish moss, my notes show, I have already testified, that the foam was not so good.

Q. Yes?—*A.* That is, the foam would not maintain itself.

Q. Let me put it this way so that we will understand one another. In all the experiments you made to produce foam, you did produce foam with the substance which you have referred to?—*A.* I produced some foam in all cases.

Q. In some cases you produced a better foam than in others?—*A.* That is correct.

Q. But you proceeded from some foam to a better quality of foam?—*A.* Well, in the case of the Irish moss experiment, the thing rather went the other way because I hit the best foam on the first experiment.

Q. And what was your first experiment again?—*A.* Two and a half per cent. Irish moss.

Q. Now, Dr. Alexander, you say that you selected Irish moss as one of the finest mucilages. What do you understand as an expert, and a man skilled in this art, by the term "mucilage" in a broad way?—*A.* I should understand by mucilage, the aqueous solutions of vegetable matter, or vegetable gum, rather.

Q. And it includes, naturally, a great many vegetable gums?—*A.* Naturally.

Q. Such as those which Mr. Rice mentions in his patent?—*A.* Will you please specify; I do not just remember what they were.

Q. Have you read Mr. Rice's patent?—*A.* I have.

Q. Do you recall any mucilaginous substances mentioned by him?—*A.* I think I had better take the patent. Why, yes he mentions Irish moss specifically.

Q. I will simplify that question, Dr. Alexander, and ask, are there any specific substances mentioned by Rice which do not come under the general, broad term of mucilaginous substances?—*A.* Well, in my opinion, yes.

Q. Other than the specific additions which he mentions such as phenol and cresol?—*A.* Well, for example——

Mr. BIGGAR: My lord, I would just like to call attention to the fact that the question my learned friend is now asking can only be directed to the credibility of the witness.

HIS LORDSHIP: I think I should like to hear that question answered.

Mr. HERRIDGE: Proceed, doctor.

HIS LORDSHIP: What is the question again?

Mr. HERRIDGE: The question, my lord, is this: I asked the witness to indicate in the Rice patent those various substances which he suggests are bubble forming agencies, to suggest some that come within the broad, general understanding of the term "mucilaginous substances."

WITNESS: My answer is Irish moss.

Q. What other?—*A.* Well, here is one I am not familiar with; I have had no experience with it—Senega root. I do not know what that is.

Q. Well, I will put it this way; apart from phenol, lysol and cresol?—*A.* I have absolutely not. In my opinion, a large number of these things mentioned by Rice could not justly be considered mucilages at all.

Q. What, for instance?—*A.* Why, gelatine is not a mucilage; white of egg is not a mucilage.

Q. Is gelatine a mucilaginous substance?—*A.* Not in my opinion.

Q. It is not?—*A.* No, not at all.

In the Exchequer Court.

Defendant's Evidence.

No. 14. Jerome Alexander. Cross-examination—*continued.*

Q. Is it a viscous solution?—*A.* Well, at a certain temperature it is a viscous solution. I tried to point out to you that a mucilage is an aqueous solution of vegetable gum.

Q. Is there any mucilage which is not viscous?—*A.* Naturally it is all viscous.

Q. Is starch composed of a mucilaginous substance?—*A.* Starch compositions may be made up——

Q. Is it or is it not?—*A.* No, I would not say in general. Starch paste is a paste, not a mucilage.

Q. You have already said that mucilage was, any solution of vegetable substance?—*A.* I said nothing of the kind.

Q. What did you say?—*A.* I will repeat it again for the third time. I said that a mucilage is an aqueous viscous solution of a vegetable gum.

Q. And what is starch?—*A.* Starch is not a vegetable gum.

Q. Is it a vegetable?—*A.* It is a vegetable, but not a gum.

Q. How do you distinguish the two?—*A.* Well, I should imagine starch mixed in with water will settle to the bottom.

Q. Can you make from starch a viscous material?—*A.* It can be done. You can also make a viscid material. You can make a great number of things from starch.

Q. Did you try any other mucilage in these experiments?—*A.* All the experiments that I made, every single one of them, are right here. I tried nothing else.

Q. I suppose, as a matter of fact, you know of other mucilages which would have done as well in those experiments as Irish moss?—*A.* No, I do not. I earnestly thought that Irish moss was the one most likely to succeed, and that is why I chose it.

Q. Can you suggest any others?—*A.* I cannot. Irish moss is cheap.

Q. Apart from expense?—*A.* Apart from expense, Irish moss is what we term "long." For example, a mucilage of tragacanth has the tendency to break off short. I have had a great deal of experience with tragacanth, having had thousands of tons of it myself in my own factory.

Q. Do you say that Irish moss then is the only mucilage which can be used adequately for that purpose?—*A.* No, I do not say that, but Bayer spoke of sea-weeds and I used the best sea-weed that could be obtained.

Q. And you can suggest no other mucilages which would be suitable for this purpose?—*A.* No. Pardon me, I do not know what might be developed if one were to hunt out all the different mucilages available and make experiments, but after having made experiments in this particular thing, I know of nothing that is more likely to succeed than Irish moss.

Q. Do you know of any other mucilage from which you can make a foam?—*A.* I think you can make a foam from gum tragacanth and gum karaya, but those foams would not be so durable as the foam made from Irish moss.

Q. How do you know?—*A.* Because I have used the materials. I have dissolved up hundreds of tons of them.

Q. Have you used any other mucilaginous materials than those two and Irish moss?—*A.* The main mucilages I have used are Irish moss, gum tragacanth and gum karaya. Those are the main mucilages. Of course, gum arabic I have also used, and that very largely, but those four are the ones I have used mainly.

Q. Now, Dr. Alexander, returning to what you said on the Rice patent again. In treating the particular experiments which you set out in accordance with the proportion of ingredients, set out in the Rice specification, I understood you to say that you used a gelatine?—*A.* I did.

Q. One per cent. gelatine?—*A.* Yes.

Q. Is that what Rice suggests should be used?—*A.* Yes. His sentence is:

> "The gas bubbles are preferably produced by whipping a gelatine mixture, such as a mixture of the following materials:
>
> | | |
> |---|---|
> | 1 % | glue |
> | 98 4/5 % | water |
> | 1/5 of 1 % | formalin solution (containing say about 40 % of formaldehyde)" |

Glue and gelatine are substantially identical terms in this connection.

Q. What connection?—*A.* What Rice is talking about. There is no substantial difference between glue and gelatine, except this, that ordinarily gelatine is a high grade light colored glue, and if it is to be used for food purpose it must be made of clean, raw material, and free from deleterious substances.

Q. Then I understand, in your opinion, you can use indiscriminately, the term "gelatine" or "glue" in this text?—*A.* In those particular cases, yes.

Q. In the text?—*A.* Quite.

Q. That is, when Rice speaks about using a glue, or a gelatine, for the purpose of making a foam, he can use either term indiscriminately, and convey the same meaning to you?—*A.* Well, I am confining myself——

Q. I am asking you that question?—*A.* Which text do you speak of? The particular sentence that I have here?

Q. I am speaking, as you very well know, in reference to the disclosure of Rice, in which he teaches you how to make a foam?—*A.* I say that not only can you use them, but he actually does use them in the same sentence. He says that——

Q. I am not asking what he does. I am asking you, as a man skilled in the art, whether for the purpose of making a foam, you can refer to glue, or refer to gelatine and use either one indiscriminately?—*A.* Certainly you can.

Q. That is your answer?—*A.* Unquestionably you can.

His Lordship: Mr. Herridge, he used the words "a gelatine mixture" in this particular case. He used the word "glue."

Mr. Herridge: "Such as a mixture of the following materials."

In the Exchequer Court.

Defendant's Evidence.

No. 14. Jerome Alexander. Cross-examination—*continued.*

HIS LORDSHIP: Yes, but just before that, "by whipping a gelatine mixture, such as a mixture of the following materials."

WITNESS: The point should be readily comprehensive to you.

Mr. HERRIDGE: Wait a minute, Dr. Alexander, until I ask you the question. What particular type of glue did you use?—*A.* I used the only one obtainable at the University Laboratory where I work.

Q. What is that?—*A.* Gelatine. Here it is. I brought a sample of it with me.

Mr. BIGGAR: My learned friend has taken it from the witness and examined it. I would like to have it marked.

HIS LORDSHIP: If you used glue or gelatine you would use the one per cent; would you use the one per cent?—*A.* Oh, yes. I used the one per cent, why, certainly. I followed exactly Rice's description. That is all I had to go by. I had never made this material before.

Mr. HERRIDGE: Now, Dr. Alexander, I suppose before you became acquainted with either Mr. Bayer's disclosure, or Mr. Rice's, you were informed on the subject of foam making generally?—*A.* Well, I have some knowledge of foam making.

Q. And in 1921, let us say, you knew that a foam could be made?—*A.* Well, of course I did. I had manufactured and sold gelatine largely for foam-making purposes. Of course I knew a foam could be made.

Q. And you had carried on various experiments in foam making?—*A.* Unquestionably; testing glues and gelatines was one of our laboratory tests. Personally I tested thousands of them myself.

Q. And all your laboratories knew how to make foams?—*A.* Make foams from gelatines, and from white of egg, and things of that kind. That was a very well known thing. Every cook in the kitchen knows it.

Q. Quite so, and from various mucilaginous substances?—*A.* Making of foam, yes. The art of making foam was very well known.

Q. Any baby knew; it has been known for hundreds of years?—*A.* Any person splashing in the water can make a foam, and a ship going to sea, where her prow carries the waves, that makes foam, but there is a big difference in the durability of the foams.

Re-examination.

RE-EXAMINED BY MR. BIGGAR.

Q. My friend was asking you about these things that were in the patent, and whether they were mucilaginous. There is one thing I see mentioned there. On page 5 he refers to soap bark under (*b*) in the second line of the 3rd paragraph. What about soap bark? Is that a mucilage?—*A.* Well, I do not think so. The essential thing is soap bark, saponin is a glucoside and not a vegetable gum.

Mr. BIGGAR: On the subject of marking these exhibits, my lord, I would suggest that we simply refer to them as the 16 glasses, numbered and labelled accordingly. And then this gelatine will be marked Exhibit B, I think. We only have A.

EXHIBIT " B."—Filed by Mr. Biggar, 7th Dec., 1928 : Sample of gelatine.

Mr. HERRIDGE : My lord, I must press my request that some of these be opened up, so that your lordship will have the same opportunity to view the structure as you did in the case of the plaintiff's exhibits. I would suggest that that would be far more instructive to your lordship, so far as these experiments are concerned.

HIS LORDSHIP : Well, they are going to be left with me.

Mr. HERRIDGE : As a matter of fact, my lord, I would suggest the plaintiff has the right to inspect these things. These are produced in glass cases, and, as your lordship can see, the mechanical consequence of pouring this structure, this liquid thing into a glass like this, is to conceal, on the surface of it, the pores.

HIS LORDSHIP : Of course, Dr. Alexander does not say that Bayer could not make a cellular cement. His case will be, no doubt, that he does not state the proportions in his patent, and that nobody could make it except by perhaps a very severe experimentation; and they say on behalf of Rice that he tells you exactly how to make it. I suppose that is his case. I have no doubt, your witness Mr. Thomson, made a cellular material, and it may have taken him some time. In fact, he thought he had made a discovery himself; he mentioned it, but he was disappointed when he found someone else was ahead of him.

Mr. HERRIDGE : Nevertheless, my lord, in this case Dr. Alexander, a witness for the defence has offered these samples to the court, to illustrate his incapacity to make a porous cement from the teachings of the Bayer disclosure. Now, his incapacity to do so, I quite agree, does not necessarily condemn Bayer.

HIS LORDSHIP : Dr. Alexander says that given time and opportunity and making many experiments, he thinks it could be done—of course, Mr. Herridge, those exhibits are there for the purpose they were put in.

Mr. HERRIDGE : I would just suggest to your lordship that I think the glasses should be broken and the contents taken out so that your lordship would have a better opportunity, and a better chance to examine them.

HIS LORDSHIP : I do not know whether it would be wise to break the glasses and look at them or not. If I want to I will do that.

Mr. HERRIDGE : I will leave it at that then, my lord, if your lordship would like to see what this witness did or did not do.

No. 15.

Evidence of John A. Rice.

JOHN A. RICE, Sworn. Examined by Mr. BIGGAR.

Q. Mr. Rice, you are the patentee named in the patent that is in question in these proceedings?—*A.* I am.

Q. And you reside at Berkeley, California?—*A.* Yes.

In the Exchequer Court.

Defendant's Evidence.

No. 15. John A. Rice. Examination—*continued.*

Q. And have done so for 11 years?—*A.* Yes.

Q. Before that you were a mining engineer and geologist, and mining ever since the year 1897?—*A.* Yes.

Q. Now, the idea that preceded the making of this invention you formed when?—*A.* In the latter part of the year 1922.

Q. And about what month?—*A.* October.

Q. And what work did you do towards working out the idea?—*A.* I experimented unsuccessfully with gelatine first, and then with glue, because the glue is the cheaper of the two, and I was naturally seeking the cheapest kind of foam.

Q. Yes, and how long did those experiments continue?—*A.* About three weeks at that time.

Q. And by the time you were ready to make an application for patent how far had you got in the way of developing the satisfactory method of making this porous cement or porous concrete?—*A.* I had used this formula which I gave first in the Canadian patent application rather extensively. I had a machine made at that time with sort of paddle-wheel blades, to be used for the purpose of beating the foam.

Q. And did you get any satisfactory results?—*A.* Yes.

Q. In a number of cases?—*A.* Quite satisfactory.

Q. Yes, exactly. This work was done where, Mr. Rice?—*A.* In Berkeley, California, at my home.

Q. Have you got a laboratory there?—*A.* I utilized the basement in the home for laboratory purposes at that time.

Q. And had done so for some time?—*A.* Yes, and since then.

Q. You then made an application for a patent in the United States when?—*A.* That application was made on the 21st of December, 1922.

Q. And did you make any commercial production of the invention subsequent to that?—*A.* Yes; in the Spring of 1923 we constructed a small building with blocks or slabs of this cellular material, according to the formula given in the patent application. Later, in the summer of 1923, we built another small house at Lake Tahoe, in California, a summer resort. About that time, I am not sure whether it was just after or just before, we made some boards, slabs like, to be used in a building which was under construction in Berkeley.

Q. Yes, and since then has the commercial use of the material, of the process continued?—*A.* Since then we have been gradually enlarging our commercial activities. During the year 1925 there were about 14 dwelling houses in Monterey—around 13 to 15 dwelling houses—,built of this material.

Q. Now, have you tried other material than glue?—*A.* Since that time I have tried many other materials.

Q. And have you found any that were more satisfactory than glue?—*A.* More satisfactory in some ways. Glue made up in this way is rather inconvenient, if it is desirable to ship it in quantities.

Q. But from the point of view of getting a satisfactory cellular concrete?—*A.* I cannot say that I have found anything that will give a better concrete, other than this foam compound as I call it.

Q. According to the formula given in your patent?—*A.* Yes.

Q. One of the witnesses, Mr. Rice, has told us that he failed to get a result by using LePage's liquid glue. Have you ever had any experience of that?—*A.* I tried it just once in a very small way.

Q. What were the circumstances?—*A.* In the United States patent offices I was called upon to demonstrate my process.

Q. Why were you called upon to demonstrate your process?—*A.* Before the examiner; he would not pass my claim. In other words, he did not seem to think that there was anything novel about it. I was trying to show him the novel feature, and in so doing it was desirable to show him all of the detail; so we made a date, and arrangement for the next day, and I was to bring in certain of the materials and make a small hand experiment demonstrating the process. I had at that time a sample of my compound made up, which was made at that time, of caseine, containing glue, however, or gelatine, and this I produced and started to make a solution with it preparatory to making it into a foam. He objected—

Q. That is, the examiner?—*A.* Yes, he objected. He said, Let us stick to the specification, make it of just what is written; and I had not brought any glue, so I suggested that perhaps an attendant might bring in some liquid glue. As it happened, right on the desk of the examiner they found a tube of LePage's liquid glue. I then made up a solution, containing a portion of this glue, a drop or two, and successfully made a foam by putting this solution in a basin and then beating it with an ordinary egg whip, and then in another dish I mixed up some cement with water, and then I combined the two very successfully into a cellular mixture, satisfying the examiner completely.

Q. Satisfying the examiner completely?—*A.* Yes.

CROSS-EXAMINED BY MR. HERRIDGE.

Q. I did not clearly understand, Mr. Rice, when you said that you got your first idea as to the development of the invention which is covered by the patent in suit.—*A.* When?

Q. Yes, what was the date?—*A.* It was in the month of October, 1922.

Q. What date in the month of October?—*A.* Well it was toward the latter part of October.

Q. How did you get this idea?—*A.* I had been working on the problem of light weight building materials, trying to devise a suitable light weight material.

Q. What suggested the idea to you, Mr. Rice?—*A.* I was on my way to San Francisco one day, and was reading a magazine called the Literary Digest. I remember definitely now, because it has been brought to my attention since, that the date of this magazine was October 21st, 1922. In there, I read of a cellular material which was being used in New Jersey, which was made by using pebbles, or sand, and wax, as an aggregate in cement. It was allowed to harden and then it was subjected to heat and

In the Exchequer Court.

Defendant's Evidence.

No. 15. John A. Rice. Cross-examination—*continued.*

the wax was melted out leaving voids, a cellular material. It occurred to me right there that there might be a cheaper substance that would do almost as well, or perhaps better, and I immediately thought of glue. Now, if I make a jelly of glue which contains a large amount of water and a small amount of glue, yet sufficient glue to be of a stiff consistency, then I can get this up into small particles, introduce them as an aggregate into cement, and after the cement has cured and dried the glue will have dried out, and the result will be a cellular structure. So I went home that evening——

Q. Just a minute. What evening was that; several days after you read this article, or the day you read the article?—*A.* That was the same day I read it.

Q. And can you fix the date, within a day or two of this publication, which you say was on October 21st?—*A.* I probably read that publication about the time that it is available at the news stand. It might have been a day or two before the 21st or it might have been a day or two after. It was about that time.

HIS LORDSHIP: It is not very important.

Mr. HERRIDGE: I am just getting an approximate idea. Go ahead, Mr. Rice.—*A.* So that night when I went home I took with me a small package of glue, which I purchased at a drug store, and I do not remember whether I put it to soak that night.

Q. At any rate you carried out experiments?—*A.* I carried out experiments then.

Q. And when did you get the results that you have in mind?—*A.* Within the next day or two, following within a day or two.

Q. And then when did you reduce, if you did reduce, this idea of yours to writing?—*A.* I cannot now remember exactly, but it was very shortly thereafter, within approximately ten days or two weeks.

Q. And in that writing, what was the entry of it? Did you make a complete description of what you conceived your invention to be?—*A.* I think so. I wrote it for the purpose of record.

Q. Recording the result of your idea?—*A.* Yes, so that I could show that I had conceived the idea prior to some date.

Q. And have you got a copy of that disclosure with you here?—*A.* I have not.

Q. Now, in that disclosure I suppose you set out in pretty much the same fashion as you did in your application a discussion of this invention and the various methods in which this foam could be made?—*A.* A part of the application, of the Canadian application, was taken from that disclosure. Another part, however, was from a specimen.

Q. Now, what part was taken from that disclosure?—*A.* Well, the large part——

Q. Will you just take the Canadian patent and point out as definitely as you can what part?

Mr. BIGGAR: My lord, I do not want to interfere with my friend's cross-examination, but if my friend's questions are directed to the contents

of some document which was prepared, this is not the proper way to prove it.

HIS LORDSHIP: Well, no, not that document to which he refers.

Mr. HERRIDGE: I am not trying to prove any document, my lord.

HIS LORDSHIP: I think I will allow it though.

WITNESS: I would say that up to the end of the second paragraph, at page 4.

Mr. HERRIDGE: What are the words?—*A.* Where it says "to give a tenacious and stable foam." That ends the second paragraph. Have I answered the question?

Q. Where is that, Mr. Rice, I cannot find it? It is the last line of the second paragraph of page 3, is that correct?

Mr. SMART: All these copies, unfortunately, have different paging.

Mr. HERRIDGE: That part, Mr. Rice, to which you have referred, the part from the beginning of the description up to that point was copied from this written document to which you have referred.

Mr. BIGGAR: I object to that, my lord. My friend asked the witness the question this way, my lord: "Up to that point, and the contents of the Canadian specification were copied from some other document." That is an attempt to prove what was in the other document without producing it, and I object.

Mr. HERRIDGE: I will put my question this way: You said, Mr. Rice, that the reduction to writing, of which you have not here a copy, set out substantially what you have indicated is set out in that part of your specification up to the point "tenacious and stable foam."

Mr. BIGGAR: I object, my lord. We had no notice to produce this paper. My friend cannot prove the contents of it in this way.

HIS LORDSHIP: The witness seems to be willing to give it. It does not seem to be against you. What is the purpose of it, Mr. Herridge?

Mr. HERRIDGE: The purpose is this, my lord: We have a Canadian patent here of a certain date. I want to find out when this witness got the idea for this, how he got the idea, and what he has now. He says I got a certain idea and I carried out certain work and I put the results of that work in writing, and I said, have you got that writing, and he said No. He tells me that I have said in that writing what I said in my Canadian specification within pages 1 and 2, as he has indicated.

HIS LORDSHIP: But what is the particular point to be served by being so exact?

Mr. HERRIDGE: Well, I think I am not exact, my lord, I am just asking him in a substantial way.

HIS LORDSHIP: The witness is pretty definite. He says around the last of October.

Mr. HERRIDGE: Well, he said, my lord, he made a writing; he reduced his idea to writing, about ten days after he first read this Literary Digest, and then he said thereafter I added something to it. Now, I submit that I have a right to find out when he added something to it.

HIS LORDSHIP: Why stress the document?

In the Exchequer Court.

Defendant's Evidence.

No. 15. John A. Rice. Cross-examination—*continued.*

Mr. HERRIDGE: I am not stressing the document. I am asking Mr. Rice, What did you add in your Canadian patent to your original writing.

Mr. BIGGAR: I object, my lord.

HIS LORDSHIP: I will allow it. Put it this way: When did he have his whole invention completed, as they would say in the United States, "reduced to practice".

Mr. HERRIDGE: Obviously he had it complete when he got his idea, but I want to find out what he did to manifest that idea.

Mr. BIGGAR: He made application for patent. It is the application for patent date that we are relying on, my lord. From our point of view it makes absolutely no difference as between October, 1922, and the 21st December, 1922.

Mr. HERRIDGE: As far as Mr. Biggar is concerned it doubtless does not, but I have a specific purpose in mind in asking this question, and if your Lordship will let me proceed I think we will get along.

HIS LORDSHIP: The other side are contending that December 21st, 1922, which was the date of the application, was the date of the invention. Now, you cannot get behind that. That is good enough is it not?

Mr. HERRIDGE: But I am entitled to find out what he did, how he got his invention.

HIS LORDSHIP: It is all in his application, Mr. Herridge, of December 21st. I suppose the American application is the same as the Canadian, is it not? Is your Canadian application the same as your U.S. application?

WITNESS: In the main, it is. In all of this first part at least, the essential part of the invention as made at that time.

HIS LORDSHIP: Well, what is the difference between your Canadian and American application?

Mr. HERRIDGE: My lord, our point is this: Rice was reading the Literary Digest. He said he got the idea of using a foam for a certain purpose——

Mr. BIGGAR: Oh, no, he did not. What he said is, that from the Literary Digest——

Mr. HERRIDGE: I am paraphrasing.

Mr. BIGGAR: But you are stating it incorrectly.

Mr. HERRIDGE: I am not.

Mr. BIGGAR: My friend has got it quite wrong. He misunderstood the witness. What the witness said was that from the Literary Digest he got the idea of substituting pieces of glue for wax in the aggregate, instead of melting out the wax, the pieces of glue being sealed up.

HIS LORDSHIP: From the Literary Digest he got the idea of cellular composition. So far as I know he may have got the whole idea of cellular material from that.

Mr. HERRIDGE: Mr. Rice, you say that there were certain things that you added afterwards to your Canadian application. What were they? —*A*. They were a larger list of materials of which foam might be made.

Q. Will you indicate them?—*A*. At that time when I applied for patent, as I remember—I cannot remember the entire contents of my American

application, but as I do remember it the foam solution consisted of water and glue, hardened by formaldehyde.

Mr. BIGGAR: I do not think this is of the slightest materiality, but I just want to save any possible rights I may have. My friend's questions are directed to the contents of a certain document, and he is not entitled to prove them in the way he is trying to prove them. Subject to that I do not mind. He can spend the rest of the morning trying to get at what he wants as long as I have saved my rights.

Mr. HERRIDGE: My question is not directed towards ascertaining the contents of the American document. The witness has himself said he made a certain disclosure at the time, and he has also said: "Thereafter I added to my Canadian patent several things which were not in that disclosure."

HIS LORDSHIP: I am going to allow you to ask the question, What is there in the Canadian patent that is not in the other.

Mr. HERRIDGE: Not in this document which he says——

HIS LORDSHIP: I do not care about that Mr. Herridge.

Mr. HERRIDGE: Will you answer that question, Mr. Rice?—*A.* As I remember, I did not have in that document any reference to casein.

Q. What else?—*A.* Probably also blood albumen.

Q. What else?—*A.* I am not so sure. I think I did refer to albumen, however.

Q. What else?—*A.* Probably I had no reference to dextrin solution, or starch. I am judging now more from what might have been than from real memory.

Q. I naturally assume that to be the case. On that basis, can you suggest any other things that you did not have in?—*A.* Probably I did not mention viscous.

Q. Lysol?—*A.* Probably I did not mention lysol.

Q. Phenol?—*A.* I do not know. Lysol and phenol I was experimenting with at the same time. They would probably go together.

Q. Cresol, I suppose, goes with lysol and phenol. Anything else?—*A.* I do not see anything else.

Q. I suppose, as a matter of fact, that there were a great many things from which foam could be made?—*A.* I believed that there were a great many things that foam could be made from. I knew, of course, that foam could be made from soap, and a great many common substances, but I did not know that these foams would be suitable by mixing in a Portland cement. That is why I made so many experiments.

Q. But you give in your patent, I suppose the combination of two or three hundred things. I suppose they are all good, they all can be used?—*A.* I do not remember giving so many.

Q. If you will look at the number and look at the combinations of them, you will find, I suppose, that they are in excess of 300?—*A.* The first thing that is necessary——

Q. Will you answer my question. I said, I suppose you know they will all serve this purpose?—*A.* They are serviceable in various ways.

In the Exchequer Court.

Defendant's Evidence.

No. 15. John A. Rice. Cross-examination—*continued.*

Q. But you know that they will serve this purpose?—*A.* I have made them all.

Q. Did you try all these combinations?—*A.* Oh, no, not all the combinations possible. That would be impossible.

Q. Why did you put them in if you did not know from your own experience that they would work?—*A.* I do know from my own experience.

Q. When did you get that experience?—*A.* At various times.

Q. Did you get that since you filed your U.S. application?—*A.* Some of them.

Q. What did you get since you filed your U.S. application? 10

His Lordship: He has named them all. Don't go over that again.

Q. Before you made your Canadian application, by experimental work you had discovered combinations of material matter that you did not know about at the time you developed the original idea?—*A.* Yes.

Q. And your Canadian application comprises a list of all the combinations that you had worked out by experiment?—*A.* Yes.

Mr. Herridge: So that, Mr. Rice, between the time you got that idea of yours, some days after the 21st October, and the time when you made this writing, whatever it was, which you suggest was about ten days after, you carried out these various experiments to which you make reference?— 20 *A.* Will you please repeat the question.

Q. Were all your experiments made within the time I have stated in that question?—*A.* All of what experiments? I have been experimenting ever since.

Q. Between those times what experiments did you make? Did you make the experiments of which you set out a record in your application in your Canadian patent?—*A.* I am sorry, but I am a little bit mixed up.

Q. Then I will put it this way: I understand that prior to the time when you made this reduction to writing in the United States, you had not carried out experiments going to show the utility of the particular elements 30 named in the Canadian patent?—*A.* Then you misunderstand, because I had successfully made quantities of cellular concrete with this first formula, which was the one that I based my American patent application upon.

His Lordship: I understood that.

Witness: Long after I had made that application. Then I experimented with casein and a great many other materials.

Mr. Herridge: After you filed your application?—*A.* Yes.

Q. You experimented with those materials to which you have specifically referred?—*A.* Largely for the purpose of finding out anything that would be more suitable, cheaper. 40

His Lordship: I think that is very plain, Mr. Herridge.

Mr. Herridge: So that you got your idea and you carried out your experiments within that ten-day period?—*A.* Yes.

His Lordship: Except that the Canadian application represents further experimental work, and gives further illustrations of how the invention might be made, the process.

Mr. Herridge: It gives further bubble-forming agencies.

HIS LORDSHIP: Yes.

Mr. HERRIDGE: He has not fixed the time in which he made these various other experiments.

HIS LORDSHIP: No, he has not. There is no evidence of that.

Mr. HERRIDGE: I suppose, Mr. Rice, when you say that you were a mining engineer you had considerable experience in chemical work?—*A.* Yes.

Q. I see that you are referred to in some of the U.S. documents as a geologist, a geological engineer, and in the Canadian application you refer to yourself as a chemical engineer. Do you make any distinction?—*A.* The application was made by my attorney.

Q. Which application?—*A.* Both of them, as a matter of fact. It was not intended that I should be called a chemical engineer. I believe had I looked over that I would not have permitted it.

Q. You do not regard yourself as a chemical engineer?—*A.* Not in the sense that one would understand, no. I have had considerable experience in chemistry.

Q. Now, you do not regard then this invention one which could only be made by a highly qualified chemical engineer?—*A.* No, I do not.

Q. It is a simple invention which would occur to any practical minded person——

HIS LORDSHIP: Well, now, that is foolish, because we are all practical minded in this Courtroom.

Mr. HERRIDGE: Well, it is a thing that could be carried out by any practical minded person if the general idea is disclosed?—*A.* One would think so.

Q. Yes. I suppose at the time, Mr. Rice, when you read this Literary Digest article, it was pretty well known to anyone skilled in the art or at all conversant with this business, that a foam could be made out of a protein substance?—*A.* Well, I cannot say that. I would think so.

Q. Did you have any practical experience with any porous materials before you read this Literary Digest article?—*A.* With cement, you mean?

Q. Yes.—*A.* Not a large experience. I had a laboratory experience.

Q. No practical experience?—*A.* No.

Q. You were not a builder?—*A.* No.

Q. You did not work with cement structures?—*A.* No.

Q. Did you know anything about the literature at the time? Have you any general knowledge of what has been done prior to you in the making of other porous materials or foams?—*A.* With respect to porous materials, I had the benefit of the article I read in the magazine which I mentioned, but very little else.

Q. Have you a copy of that article?—*A.* I have not. With respect to foams, I suppose I had the experience of the average man.

Q. Did you ever hear of an inventor by the name of Dewric Sanford?—*A.* Yes.

Q. Do you know anything about his work?—*A.* Not at that time.

Q. You never heard of him at that time?—*A.* No.

In the Exchequer Court.

Defendant's Evidence.

No. 15. John A. Rice. Cross-examination—*continued.*

Q. But you have learned of him since?—*A.* Yes.

Q. Did you ever see a patent of his which disclosed a method for making a spongy mineral composition?—*A.* No, I have not.

Q. In which he——

HIS LORDSHIP: Mr. Herridge he says that he never heard of Sanford or his invention up to the time he made his.

Mr. HERRIDGE: I will just finish that question, my lord. Did you know that at the time, or have you learned since, Mr. Rice, that in 1880 Sanford suggested in this patent, to which I have referred, that glutinous, mucilaginous substances, saponin, gummy or resinous materials, could be used for bubble-forming purposes?—*A.* No.

Q. Have you heard since?—*A.* No.

Q. Would you contradict him if I tell you that is what he says?—*A.* Would I?

Q. Yes.—*A.* No.

Q. You agree that that is correct?

Mr. BIGGAR: I object, my lord. There is a limit to which my friend can go.

HIS LORDSHIP: He says he does not deny that Sanford did say that. I understand the Sanford patent is not in evidence.

Mr. HERRIDGE: The Sanford patent is not in evidence, my lord, specifically. The Sanford patent, together with the other publication to which the plaintiff's witnesses have referred, constitute a part of the public knowledge at the time, constitute part of the art, and, therefore, are pieces of evidence of which I submit your Lordship should take judicial note.

HIS LORDSHIP: I do not see how I can. You mean that Bayer's patent should be declared void and that Rice's should be declared void?

Mr. HERRIDGE: Not at all. It has this fundamental purpose, my lord, that your Lordship will take note of what the witnesses say as to the common general knowledge of the art at the time these inventors made their inventions, then your Lordship will appreciate this point which we have been trying to make, that in the making of a durable foam, in the making of a foam out of mucilaginous substances, in the making of a foam out of any one of the substances which Rice or Bayer suggests, there is absolutely nothing new.

HIS LORDSHIP: We are all agreed. There is no contest about that. The making of bubbles and foam is an old thing. Mr. Thomson and everyone agrees to that.

Re-examination.

RE-EXAMINED BY Mr. BIGGAR.

Q. What were the difficulties with regard to getting a foam that would do for this purpose? What was the first necessary qualification of the kind of foam that you had to use?—*A.* I was experimenting most particularly with Portland cement. The first requisite, of course, was that the foam should stand up a sufficient length of time to get it mixed into the cement. That was the first qualification. Second, it was very necessary that after it was mixed with the cement forming a cellular composite mass, that it

would continue to retain that tough quality until the chemical action of the setting of the cement, or until the cement had set to a sufficient strength to support itself.

Q. Exactly.—*A.* Usually it is about six hours of ordinary temperature, in cases the foam loses its characteristic of toughness, before the cement was strong enough——

Q. To what extent did you find, in the course of your experiments, that there was foamy material which would make a foam, but not a sufficiently strong foam to stand up during those six hours?—*A.* I found, in the course of years of experimenting, that a very very large per cent. of all foams are absolutely worthless for that purpose.

Q. Exactly. Now, what affects the foam, or the bubbles, while the cement is setting? Is there any, except a mechanical reaction between the setting of the cement and the bubbles?—*A.* Yes.

Q. What kind of reaction?—*A.* The setting of the cement produced heat for one thing.

Mr. HERRIDGE: Of course, I submit that is not proper re-examination. I did not raise the point in cross-examination.

HIS LORDSHIP: You won't finish before one?

Mr. BIGGAR: If your Lordship likes, I think I can.

HIS LORDSHIP: Well, we will adjourn till 2.30.

(Resumed.)

Q. Mr. Rice, when we adjourned you were on the point of reactions between the cement and the material from which the foam is produced?—*A.* If the foam contains any substance that will react chemically with lime, calcium hydrate is another name for the same thing, and inasmuch as Portland cement releases during setting a definite and almost continuous supply of calcium hydrate, then I say if there is anything in the foam that is mixed with it to make cellular concrete which will react chemically with this calcium hydrate, then during the time setting when the cement is still soft, the bubbles may be destroyed, causing a slump and a breaking up of the cellular structure before setting has had time to take place.

Q. What is the characteristic material, or principal material with which the calcium hydrate in Portland cement may react in the way you describe?—*A.* In the case of using a soap to make foam, it makes a wonderful foam, but when introduced into the cement that part of the soap known as the acid—in some cases it is stearic acid—and other kinds of similar acids—organic acid reacts with the lime forming an insoluble compound, thus breaking the bubble.

Q. I see. Then putting it shortly, what are the qualities of the foam producing material which it must have in order to make an effective foam for the purposes in hand?—*A.* In the case of Portland cement there are three. We have spoken of only two. One of them is that the compound used must have a soap or foamy consistency such that a foam can be produced, and a sufficiently strong foam, so that it will last during the mechanical operation of mixing with the cement. Second, this foam must

In the Exchequer Court.

Defendant's Evidence.

No. 15. John A. Rice. Re-examination—*continued.*

Re-cross-examination.

have such a chemical make-up, or constitution, that it will not be destroyed by chemical action by means of the material of the cement itself. And, thirdly, it must not contain any material which will chemically affect the cement in such a way as to impair its ultimate strength.

Mr. BIGGAR: I think that is all.

RE-CROSS-EXAMINED BY MR. HERRIDGE.

Q. And do you say, Mr. Rice, that all the suggested means set out in your patent avoid this undesirable result?

Mr. BIGGAR: I object, my lord. Perhaps my objection is formal, but Mr. Rice's patent is not attacked on the ground that it won't work.

Mr. HERRIDGE: I am not attacking Mr. Rice's patent.

Mr. BIGGAR: Well, then the question is irrelevant.

HIS LORDSHIP: It is a natural result of your own question, and I will receive it subject to your objection.

Mr. BIGGAR: Of course, it is not re-cross-examination.

HIS LORDSHIP: I think it is.

Mr. BIGGAR: But my friend has cross-examined, my lord. It did not arise out of my re-examination.

HIS LORDSHIP: I thought it did.

Mr. BIGGAR: There was nothing new in my re-examination.

HIS LORDSHIP: Oh, I think so. Your questions, since we resumed this afternoon, had not been put to the witness before, and if that is admitted I do not think I am wrong there, Mr. Biggar.

Mr. BIGGAR: I won't trouble to argue, my lord.

Mr. HERRIDGE: Will you answer the question?

WITNESS: Will you give me that question, please?

(Reporter repeats question.)

HIS LORDSHIP: This is received subject to the objection.—*A.* I do not.

Mr. HERRIDGE: You do not say so?—*A.* No.

Q. Then some of the materials given in your patent will not work?—*A.* No, I do not say that.

Q. Well, do you know?—*A.* Yes.

Q. What do you say?—*A.* These additional materials given in my patent specification, some of them are intended for one purpose, some for another. They are expedients for improving the compound used.

HIS LORDSHIP: You must not go too far, because if this patent is not attacked—as it is not—then of course it does not matter.

Mr. HERRIDGE: The patent is attacked on this ground indirectly, my lord: The plaintiff's case is that all these illustrations given in the patent are pure surplusage. They do not add anything to the common knowledge in the art at the time the invention was made, therefore, I submit, that this question I am asking now is extremely pertinent.

HIS LORDSHIP: You are attacking the patent on the ground of anticipation.

Mr. HERRIDGE: I am. And to do that I have to show your Lordship that what Rice invented was disclosed in Bayer.

Mr. BIGGAR: Thank you, Mr. Rice.

Mr. SMART: My lord, there is a purely formal point of proving a statute of the United States law. Perhaps my learned friend, if I read the statute, will concede that that is the United States law, and we could have it on the record. I will read the statute, a section of the statute. It is section 4887 of the Revised Statutes of the United States. It corresponds, in terms, to section 8(2) of our Canadian Patent Act. Perhaps if I gave it to the reporter he might have it extended on the notes. Will my learned friend agree that that is a statute of the United States?

HIS LORDSHIP: Explain it.

Mr. SMART: The section is "Priority by Treaty":

> "An application for patent for an invention or discovery for a design filed in this country by any person who has previously regularly filed an application for a patent for the same invention, discovery or design in a foreign country which, by treaty, convention or law, affords similar privilege to citizens of the United States shall have the same force and effect as the same application would have if filed in this country on the date on which the application for the Patent for same invention, discovery, or design was first filed in such foreign country, provided the application is filed within twelve months in cases within the provisions of section forty-eight hundred and eighty-six of the Revised Statutes, and within four months in cases of designs, from the earliest date on which any such foreign application was filed. But no patent shall be granted on an application for patent for an invention or discovery or a design which had been patented or described in a printed publication in this or any foreign country more than two years before the date of the actual filing of the application in this country, or which had been in public use or on sale in this country for more than two years prior to such filing."

HIS LORDSHIP: Did not that all come within the agreement of yesterday?

Mr. SMART: That was the International Convention. This is the statute by which the International Convention is carried out in the United States, and, as a mere formality, I wish to put it on record.

HIS LORDSHIP: What do you say Mr. Herridge?

Mr. HERRIDGE: We admit that Rice filed his U.S. application on the date which my friends say he filed it.

Mr. SMART: I am only asking my learned friend to concede that this section is a section of the U.S. Statute law.

Mr. HERRIDGE: I do not know it. I am willing to concede anything. I do not say it is not, but I do not know.

Mr. SMART: That is quite all right.

In the Exchequer Court.

Defendant's Evidence.

No. 16. Henry H. Byrne. Examination.

No. 16.

Evidence of Henry H. Byrne.

HENRY H. BYRNE, sworn. Examined by Mr. SMART.

HIS LORDSHIP: It does seem to me that in matters of this kind there ought to be some stipulation, bringing a witness from the United States to prove a statute.

Mr. HERRIDGE: I am willing to stipulate anything. My friend, Mr. Smart, asked me if I would agree that that is the Statute.

HIS LORDSHIP: I have not in mind this case.

Mr. HERRIDGE: I do not know whether it is the statute or not, my lord.

HIS LORDSHIP: All right, it will only take a moment.

Mr. SMART: Mr. Byrne, you are a member of the Bar in the United States?—*A.* I am.

Q. What Bar?—*A.* District of Columbia, State of Virginia.

Q. And familiar with the U.S. laws dealing with patents?—*A.* I am.

Q. Section 8 (2) of the Canadian law deals with certain rights of priority granted to applications filed in foreign countries—you have read section 8 (2) of the Canadian Act?—*A.* I have.

Q. And does the United States by law grant any similar privilege to citizens of Canada?—*A.* It does.

Q. In what section?—*A.* Section 4887.

Q. Of the Revised Statutes?—*A.* Of the Revised Statutes.

Mr. SMART: Perhaps you will give that to the reporter, and take it as having been read into the record. That is the Statute law of the United States.

HIS LORDSHIP: The witness says that the Statute law of the United States on this point is section 4887, "Priority by treaty."

Mr. SMART: Any cross-examination?

Mr. HERRIDGE: Oh, no.

Mr. BIGGAR: That is the case for the Defendant.

Plaintiffs' Evidence in Reply.

No. 17. George M. Thomson (re-called). Examination.

No. 17.

Evidence of George M. Thomson (re-called).

GEORGE M. THOMSON, re-called. Examined by Mr. HERRIDGE.

Q. You are already sworn, Mr. Thomson. Are you skilled, Mr. Thomson, especially in the chemistry of colloids?—*A.* Not at all.

Q. I understand that your specialty is in connection with the non-metallic minerals of which cement and gypsum are examples?—*A.* I think I am, yes.

Mr. HERRIDGE: It has been admitted that foam may be made from innumerable bubble-forming agencies.

HIS LORDSHIP: That is in.

Mr. HERRIDGE: Now with that knowledge which is common to the art, Mr. Thomson, and which is admitted is common to the art, and with no other information with respect to particular colloids, have you made a porous building material by the use of foam and a cement or gypsum?

MR. BIGGAR: I object, my lord, it is not rebuttal.

HIS LORDSHIP: I think that is in too.

Mr. HERRIDGE: Even if it is in it will do no harm, and I submit it is rebuttal, because it is leading up to a question which I think is strictly rebuttal. If your Lordship will reserve your opinion for a moment.

Q. What is your answer to that question?

Mr. BIGGAR: Does your Lordship allow the question?

Mr. HERRIDGE: What is your answer?

HIS LORDSHIP: Be sure that you do not trespass on ground that this witness has gone over.

Mr. HERRIDGE: I won't.

(Reporter repeats question.)

WITNESS: Yes, I have.

Mr. HERRIDGE: Mr. Thomson, you heard Dr. Alexander explain how he carried out his experiments, and which he said gave unsatisfactory products?—*A.* Yes, I did.

Q. Can you suggest a reason, as a man qualified as you are, why these experiments failed?

Mr. SMART: Surely that is leading.

MR. HERRIDGE: I think not.

Mr. SMART: I have no doubt you do.

HIS LORDSHIP: The question is perfectly all right.

Mr. SMART: But it is a leading question, my lord. Can you suggest something. Surely the question suggests the answer if ever a question did.

HIS LORDSHIP: Do you know of any reason why.

Mr. HERRIDGE: I will put it that way if you like.

HIS LORDSHIP: Do you know of any reason why the experiments made by Dr. Alexander were not successful?—*A.* All cements, including Portland cement and plaster of paris, have a definite affinity for water. The percentage of water absorbed, or necessary to hydrate a Portland cement does not vary greatly between different types of Portland cement, because Portland cement is manufactured on a definite formula. Plaster of paris is made directly from gypsum which varies in every deposit in the material, consequently, every plaster of paris produced varies according to the properties of the gypsum from which it is made, and the amount of water necessary to satisfy the affinity of plaster of paris, in other words, sufficient water to put it into solution before it re-crystallizes out into gypsum, would vary roughly between 5 per cent. and 90 per cent. It may be readily understood that the amount of water in a foam added to a cementitious slurry, amounts to a very small percentage of the amount of water required to

In the Exchequer Court.

Plaintiffs' Evidence in Reply.

No. 17. George M. Thomson (re-called). Examination—*continued.*

satisfy the affinity of a plaster of paris, or a cement, and if that affinity for water in the cementitious material were not nearly satisfied the amount of moisture forming the bubble surfaces in the foam would be entirely used up, and, therefore, the gas would escape. In other words, the foam would be destroyed through absorption.

Mr. HERRIDGE: Have you finished your answer?—*A.* Yes.

Q. So that I take it from what you say, Mr. Thomson, that if Dr. Alexander had used sufficient water to completely satisfy the affinity of the gypsum, or the cement for water, he would have had an entirely different and satisfactory result?—*A.* From my own experience, I would say unquestionably that that is the answer to his failure.

Q. Just one other point, Mr. Thomson. You heard what Mr. Rice had to say about the unfavourable, unsatisfactory reaction between the cement and the foam when certain ingredients for foam were employed. Now, would that statement, whether correct or not correct in any particular, apply as correct to the employment of mucilages or mucilaginous substances?—*A.* If a person were sufficiently conversant with the reactions to Portland cement on hydration, he would not be seriously concerned with the effect of the free lime and the Portland cement reacting to form a lime stearate. Portland cement is composed of several minerals, one of which is dry calcium silicate. On hydration the dry calcium silicate breaks down to the ammonia calcium silicate throwing off free lime. That does not occur within the first 24 hours, so that when a cement is used commercially, setting in a few hours, or less than ten hours; as a rule, that lime is not available in the setting of Portland cement, so that the actual hardening of the cement occurs before that free lime is liberated. In my experience with foam made from saponin, for instance, so that the foam was not destroyed in mixing with the Portland cement——

Q. And I think you said that some of your experiments were carried out with Irish moss extract. Were there any chemicals in that extract which reacted unfavourably when the foam was mixed with gypsum or Portland cement?

Mr. BIGGAR: I object, my lord.

Mr. HERRIDGE: Will you answer that question?

(Reporter repeats question.)

Mr. BIGGAR: Does your Lordship understand that my friend is now asking this witness for some evidence with regard to experiments that this witness conducted?

HIS LORDSHIP: I did not understand it quite in that way. I understand that it is intended as applying with reference to some evidence of Mr. Rice, certain results which he got.

Mr. HERRIDGE: That is it, my lord.

Mr. BIGGAR: Mr. Rice did not say anything about any experiments with Irish moss, my lord. He was not examined or cross-examined on that.

HIS LORDSHIP: Let us be sure about that. What did Mr. Rice say?

Mr. HERRIDGE: What Mr. Rice said, and what Mr. Rice implied in the answer to my friend's question was that there were certain substances which,

if employed to make a foam, would react unfavourably when mixed with gypsum. Mr. Rice's answer was of a general nature. I submit, my lord, that that general answer related inevitably to the statement of the witness made previously, and I submit that he has now the right to extract himself from that blank condemnation of his evidence. It seems to me a perfectly proper and logical question to ask, as the result of the examination of Mr. Rice by my friend.

HIS LORDSHIP: I will allow the question.

WITNESS: Do you wish me to answer it, my lord?

HIS LORDSHIP: Yes.

WITNESS: The only reaction that I observed was a retarding of the setting time of the cement when the foam made from the Irish moss extract was used for aerating the cement, or making a cellular product. Anyone conversant with the manufacture of Portland cement knows that Portland cement ground from the calcine, as manufactured in the kilns, will set in a very few minutes. To retard the setting time of that Portland cement so that it can be used commercially and mixed and carried over a certain distance, and poured into forms before it has set, a small percentage of gypsum is included. When I observed that the foam made from Irish moss extract did retard the setting time of the cellular Portland cement specimen which I was endeavouring to make, I got some Portland cement calcine and had it pulverized before and gypsum was added as a retarder, so that I was working with the true Portland cement without any retarder, and simply allowed the natural retarding effect of the Irish moss foam to retard the cement, and I got almost a normal set with it, of the same ultimate strength that I would have got with any other type of foam.

Q. So that I conclude you found the Irish moss quite satisfactory?—*A.* Absolutely.

HIS LORDSHIP: Dr. Alexander said the same thing, did he not, about the retarding effect of Irish moss. Perhaps he did not.

CROSS-EXAMINED BY MR. SMART.

Mr. BIGGAR: My lord, this witness in his examination in chief, as I understood it, I think suggested that he had made, or attempted to make, cellular cement out of an Irish moss solution. He referred to Irish moss according to my memory, only with regard to some special experiment that had nothing to do whatever with cellular cement.

Mr. HERRIDGE: You are in error, Mr. Biggar, in that.

Mr. BIGGAR: I think I am quite right.

HIS LORDSHIP: Perhaps the witness could tell you.

Q. What did you say? Did you say in your direct evidence that you had made experiments with Irish moss?—*A.* My lord, the connection was this: After I had obtained the positive results in manufacturing a cellular cementitious product, by mixing a pre-made foam with the cementitious slurry, I learned to my disappointment that I had not made an original invention. I was apprised of this fact on being shown the Bayer patent. As a matter of curiosity, as to whether the use of an extract, a colloidal

In the Exchequer Court.

Plaintiffs' Evidence in Reply.

No. 17. George M. Thomson (re-called). Cross-examination—*continued.*

extract made from Irish moss, would economically supply the saponin which I had already used, I made experiments with Irish moss.

Q. Did you say so yesterday?—*A.* Yes, my lord.

Mr. SMART: The record will show that he did not say that yesterday.

HIS LORDSHIP: I do not know that it is a very serious matter anyway.

Mr. SMART: It is serious, because that was not the case we met in our defence.

Mr. HERRIDGE: Well, I suggest that the record be investigated, because I prefer to accept the statement of the witness on that point.

HIS LORDSHIP: You must not say that, Mr. Herridge.

Mr. HERRIDGE: My lord, the witness naturally would have the best recollection of what he himself said.

HIS LORDSHIP: As between you and he, yes, but I suppose the record is the best source of information. My recollection is that he did say that.

Q. Did I understand you to say yesterday that on account of the expense you could not continue its use commercially?—*A.* There was no economical advantage in the use of Irish moss extracts in obtaining foam made from saponin.

Mr. BIGGAR: Your Lordship sees the point. It is really this: Whichever of us is right, either this evidence was not admissible as rebuttal, or, if your Lordship admits it as rebuttal it is, in our view, making a new case.

HIS LORDSHIP: That would be very serious. If so, I did not quite understand. It is perhaps my fault, but I do not quite see how it makes the difference. Does it cause surprise to you?

Mr. BIGGAR: It surprises us.

HIS LORDSHIP: Does it require an explanation?

Mr. BIGGAR: It will require an explanation.

Mr. HERRIDGE: I was going to suggest before your Lordship admits any evidence, that perhaps it might be simpler to investigate the record.

HIS LORDSHIP: I would not take time to investigate the record when we can clean it all up in a minute.

Mr. SMART: How did you prepare the extract of Irish moss, Mr. Thomson, that you have referred to?—*A.* It was prepared in the steam jacket kettle.

Q. Did you do it alone, or with other ingredients? Did you use it alone or with other ingredients to make the foam mixture?—*A.* As a matter of fact, it was used in two different ways. It was used alone, and it was also used with a certain type of glue, which is itself associated with——

Q. You used it with glue, and you used it alone?—*A.* Yes.

Q. In what percentage did you use it?—*A.* I cannot tell you the exact percentage. I think the commercial extract is used in one of our plants. The equipment was there for making the extract. They are making it not every day, but very frequently. My recollection is that the first amount that I used was ineffective in producing a foam, and was a matter for diluting with water; until I could get the foamy action it was simply a downward progression.

Q. You tried a series of experiments until you hit on the one that worked?—*A.* It was all done within an hour or two hours.

Q. You did try a series of experiments?—*A.* That is quite right.

Q. And have you any recollection today of what you finally hit on as the result of those experiments?—*A.* My laboratory records would show it.

Q. I mean, have you any recollection today; that was the question?—*A.* Well, my recollection is that it is somewhere down around two per cent. solution.

Q. Somewhere down around two per cent.?—*A.* Yes.

Q. And what range did you try? Was the range downward or upward from 2 per cent?—*A.* It was downward to 2 per cent. About 2 per cent. I would not care to be fixed at 2 per cent. I am giving that from memory.

Q. And how low did it go, half of one per cent. or how low?—*A.* No. I imagine I got the positive result with 2 per cent. or about that.

Q. And how long ago was that done?—*A.* I think that was January, 1927, somewhere about there, but I am not positive of the date.

Q. What does this commercial extract of Irish moss contain?—*A.* I cannot tell you that.

Q. You cannot tell me?—*A.* No.

Q. It is sold on the market for what purpose?—*A.* Irish moss?

Q. No, no, the commercial extract?—*A.* It is not sold on the market that I know of.

Q. You make it for your own purposes?—*A.* For our own purposes.

Q. Did you try it only with gypsum?—*A.* No, I tried it with both cement and gypsum, with plaster of paris.

Q. Were the results the same?—*A.* Not at all. We do not get the same result with Portland cement, the same relative expansion, because the specific gravity of the two raw materials is different.

Q. Without your notes we can hardly ask for some details of quantities?—*A.* No, I am not prepared to give the details.

Q. You are not prepared to give the details of quantities?—*A.* No.

Q. There are many theories on the hydration of cementitious material, are there not, at least there are several different theories?—*A.* There are a great many.

Q. And, as you expressed in opening, those are the ones you personally adopt?—*A.* Yes.

Q. But you would not say that it is a matter that is finally settled at the present time?—*A.* No, I would not, but that is the theory.

Q. That is the theory which you prefer to adopt?—*A.* Yes.

Q. As to this chemical action of the foam forming constituents, is it not true that this Stanford patent that you mentioned refers to that chemical action where an algin solution is used?

Mr. HERRIDGE: I would suggest you refer to the document.

Mr. SMART: I have not the document, and the witness referred to it in his direct examination yesterday, so I assume he has knowledge of it.

WITNESS: I referred to the mention of saponin in the Stanford patent.

In the Exchequer Court.

Plaintiffs' Evidence in Reply.

No. 17. George M. Thomson (re-called). Cross-examination—*continued.*

Q. Do you remember this chemical action referred to there?—*A.* There is no chemical action.

Q. You remember that if algin was used instead of saponin—the chemical action is referred to there?—*A.* As far as I am aware, there is no chemical action occurring when you hydrate one of these organic materials to produce a foam. I am not a chemist.

Q. Do you remember any articles of Stanford dealing with the uses of his material?—*A.* Are you speaking of Sanford or Stanford?

Q. Stanford?—*A.* I do not know the patent at all.

Q. You do not know the Stanford patent?—*A.* No.

Q. Now, the possible reason that you have given for the failure of Dr. Alexander's experiments, or whatever results he obtained with regard to them, of which he has given evidence, would apply equally to all of them which he described, and which is shown in these various bottles?—*A.* Not at all.

No. 18. Alexander E. MacRae (re-called). Examination.

No. 18.

Evidence of Alexander E. MacRae (re-called).

ALEXANDER E. MACRAE, re-called. Examined by Mr. HERRIDGE.

Q. You have heard, Mr. MacRae, what Mr. Rice had to say about the unfavourable chemical reactions, when certain elements were employed for foam-making purposes, and the foam mixed with a gypsum or cement. What have you got to say about that?—*A.* I would say that from my knowledge of these materials, and from my general chemical knowledge, it might well be that if one used a complex mixture, such as a number of the ones disclosed in the Rice patent, for example—I do not say all of those but some of them might well produce chemical reactions with gypsum, or with cement, which might be unfavourable, but if one takes the ordinary common mucilaginous substances such as those disclosed and named in the old Sanford patent—not Stanford but Sanford—No. 230159, dated July 20th 1880, he can make a foam which will not react with either gypsum or cement. Sanford states that he uses in his process of making spongy mineral compositions——

Mr. BIGGAR: I object, my lord.

WITNESS: For non-conductors.

Mr. BIGGAR: My objection is that, in the first place, this is not rebuttal, my lord, and, in the second place that the witness is giving the contents of a document.

HIS LORDSHIP: The last objection seems sound.

Mr. HERRIDGE: My answer to that, my lord, is that the witness is giving common, general knowledge at the time.

HIS LORDSHIP: Well, he need not refer to the patent. He can take a patent, if in evidence, and discuss that.

Mr. HERRIDGE: We do not want to file the patent.

HIS LORDSHIP: Of course, if you had filed it you might have discussed it.

Mr. HERRIDGE: We did not file it, because we are not setting up, as your Lordship asked yesterday, Sanford as anticipation of Rice. We are merely offering Sanford, and these other documents, as evidence of the fact that in the art at that time there was common knowledge.

HIS LORDSHIP: Well it is not in evidence anyway.

WITNESS: I do not need to refer to it, your Lordship. I did know that insulex, for example, was made by releasing gases chemically in a slurry of cement or gypsum. It was applied to gypsum particularly, and in order to retain in the slurry the gas bubbles, there was used a mucilaginous substance, a glutinous substance, any substance which would retain the bubbles so as to enable the operator to mix the slurry and retain in it these gas bubbles so that the same might set, and have in it these powers which are desired for insulating capacity, and that there was no chemical reaction between the gypsum and the bubble-holding agent which was used.

Mr. HERRIDGE: That is all.

Mr. BIGGAR: I have no questions, my lord.

Mr. HERRIDGE: That is the Reply, my lord.

EXHIBITS C-1 to C-16 (inclusive).—Filed by Mr. Biggar, 7th December, 1928: Glass containers.

Mr. HERRIDGE: I do not know what your Lordship's wishes are in regard to argument.

Mr. BIGGAR: I am not going to reply or give any more evidence, my lord.

HIS LORDSHIP: I will hear you first, Mr. Herridge.

No. 19.

Formal Judgment.

IN THE EXCHEQUER COURT OF CANADA.

Wednesday the 6th day of March, A.D. 1929.

Present: THE HONOURABLE THE PRESIDENT.

Between

FRITS RICDOLF CHRISTIANI and AAZE NIELSEN, trading under the name, firm and style of Christiani & Nielsen, and the said CHRISTIANI & NIELSEN - - - - - - - - *Plaintiffs*

and

JOHN A. RICE - - - - - - - - - - - - *Defendant.*

This action having come on for trial before this Court at the City of Ottawa on the 6th, 7th and 8th days of December, A.D. 1928, in the presence

In the Exchequer Court.

No. 19. Formal Judgment, 6th March 1929—*continued.*

of Counsel for both the Plaintiffs and the Defendant; upon hearing read the Pleadings herein and the evidence taken on commission on the 14th day of August, A.D. 1928, in the City of Copenhagen in the Kingdom of Denmark, and upon hearing the evidence adduced at trial and upon hearing what was alleged by Counsel aforesaid, this Court was pleased to direct that this action should stand over for judgment and the same coming on this day for Judgment;

This court doth order and adjudge that this action be and the same is hereby dismissed with costs to be paid by the said Plaintiffs to the said Defendant.

By the Court,

"Arnold W. Duclos,"

Deputy Registrar.

No. 20. Reasons for Judgment of MacLean, J., 6th March 1929.

No. 20.

Reasons for Judgment of MacLean, J.

MACLEAN, J.

Judgment rendered March 6th, 1929.

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 11th, 1925, the application for the same having been filed on June 13th, 1924. Rice applied for a patent in the United States on December 31st, 1922, covering the same subject matter, and later he there received a 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 11th, 1922, issued on June 19th, 1923, and published on July 2nd, 1923. On November 9th, 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 infinite 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 :—

> " 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 sea tang, 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.

In the Exchequer Court.

No. 20. Reasons for Judgment of MacLean,J., 6th March 1929—*continued.*

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 |
> | 98 4/5% | water |
> | 1/5 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 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 very 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 solution, starch paste (boiled) Irish moss, agar 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, resin, 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, ... 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, (*g*) ammonium resinate and glue.

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

(1) 500 parts by volume of 2% glue solution.
6000 „ „ „ „ „ cold water.
25 „ „ „ „ „ resin solution in ammonia (about 0·5% solution).
½ „ „ „ „ „ " Creosol Compound U.S.P."

In the Exchequer Court.

No. 20. Reasons for Judgment of MacLean, J., 6th March 1929—*continued.*

(*k*) 2000 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 1800 parts of water. The amounts of rosin and wax can be increased to about 100 parts if desired.

(*l*) Adding enough dilute acid (H Cl or H2 S04) 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; aluminium sulphate, aluminium chloride, iron chloride or sulphate, 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 A12 (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 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 tangin (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 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 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

In the Exchequer Court.

No. 20. Reasons for Judgment of MacLean, J., 6th March 1929—*continued.*

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 laboratory 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 exclusively 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 complete 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 or 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 plaintiff's 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 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.

In the Exchequer Court.

No. 21. Agreement as to contents of Case for Supreme Court of Canada, 4th September 1929.

No. 21.

Agreement as to contents of Case for Supreme Court of Canada.

The parties agree that the Case on Appeal to The Supreme Court of Canada shall consist of the following:—

1. Statement of Case.
2. Statement of Claim.
3. Particulars of Objection.
4. Demand for Particulars.
5. Further Particulars of Objection.
6. Statement of Defence.
7. Evidence at trial to include Evidence taken on commission in Copenhagen on August 14, 1928, and filed as part of the Evidence at trial on December 6, 1928, and extracts from Publication by C. V. Boys entitled " Soap Bubbles " on pages 103, 113, 115, 116 and 171.
8. Exhibits produced and filed at trial.
9. Formal Judgment.
10. Reasons for Judgment.
11. Order dispensing with the printing of Exhibits.
12. Agreement as to Contents of Case.

Dated at Ottawa this 4th day of September, A.D. 1929.

Henderson & Herridge,
Solicitors for the Appellants.

Smart & Biggar,
Solicitors for the Respondent.

In the Supreme Court.

No. 22. Order dispensing with printing of Exhibits, 4th September 1929.

No. 22.

Order dispensing with printing of Exhibits.

IN THE SUPREME COURT OF CANADA.

Before the Registrar in Chambers.

Wednesday, the 4th day of September, A.D. 1929.

Between

FRITS RICDOLF CHRISTIANI and AAZE NIELSEN, trading under the name, firm and style of CHRISTIANI & NIELSEN, and the said CHRISTIANI & NIELSEN - (*Plaintiffs*) *Appellants*

and

JOHN A. RICE - - - - - - - (*Defendant*) *Respondent.*

Upon application of the Appellants and upon hearing read the Consent dated the 4th day of September, A.D. 1929, and upon hearing what was alleged by Counsel for the Appellants:

It is ordered that the printing of Exhibits 5, 6, 7, 8, B, C1 to C16, inclusive, be dispensed with.

And it is further ordered that the printing of the Danish version of Danish patent dated June 19, 1923, be dispensed with upon the Appellants printing in lieu thereof an English translation thereof.

And it is further ordered that Exhibit Number 1 filed as part of the Evidence taken on commission on the 14th day of August, 1928, in the City of Copenhagen, in the Kingdom of Denmark, and read in as part of the Evidence at trial on the 6th day of December, 1928, be and the same is hereby dispensed with.

And it is further ordered that the printing of the Danish transcript of Exhibits Nos. 2, 3, and 4 of the Evidence taken on commission at the said City of Copenhagen on the 14th day of August, 1928, be and the same is hereby dispensed with upon the Appellants printing translations thereof.

E. R. Cameron,
Registrar.

No. 23.

No. 23.

Registrar's Certificate, 12th September, 1929.

(*Not printed.*)

In the Supreme Court.

No. 24.

Statement of Case.

No. 24. Statement of Case.

IN THE SUPREME COURT OF CANADA.

Between

FRITS RICDOLF CHRISTIANI and AAZE NIELSEN, trading under the name, firm and style of Christiani Nielsen, and the said CHRISTIANI & NIELSEN - - - (*Plaintiffs*) *Appellants*

and

JOHN A. RICE - - - - - - - - (*Defendant*) *Respondent.*

This is an appeal from the Judgment of the Honourable the President of The Exchequer Court of Canada rendered on the 6th day of March, A.D. 1929, dismissing the Plaintiffs' action with costs.

From this Judgment the Appellants now appeal to the Supreme Court of Canada.

No. 25.

Factum of Christiani & Nielsen.

No. 25. Factum of Christiani & Nielsen.

(*Note : Marginal references have been altered to agree with this Record.*)

IN THE SUPREME COURT OF CANADA.

Between

FRITS RICDOLF CHRISTIANI and AAZE NIELSEN, trading under the name, firm and style of Christiani & Nielsen, and the said CHRISTIANI & NIELSEN - (*Plaintiffs*) *Appellants*

and

JOHN A. RICE - - - - - - - - (*Defendant*) *Respondent.*

PART I.

STATEMENT OF FACTS.

1. This is an appeal from the Judgment of the Honourable the President of the Exchequer Court of Canada, dated the 6th day of March, 1929, dismissing the action of the Appellants brought to impeach Canadian Letters Patent Number 252,546 issued to the Respondent.

2. The patent in suit to the Respondent John A. Rice, which issued on the 11th day of August, 1925, is for " Cellular Cement Products and

Processes of Making Same." Paragraph 1 of the Specification of the Rice patent is as follows:—

"The present invention relates to improvements in plastic compositions and its particular object is to provide a cellular composition or product adapted to be used for walls, constructional purposes, fireproofing of the frame work of steel buildings and practically all purposes that concrete can be used for and that is not only considerably lighter in weight than the concrete mixtures now commonly used but it contains a large number of cellular voids adapted to improve the heat insulating and sound-insulating properties of the material. The invention embraces especially a method of impregnating cement while in a dry or soft state with gas bubbles preferably produced by whipping a gelatinous substance in the presence of water into a foam or lather, the said material being preferably rendered tenacious or hardened, as by formaldehyde. The bubbles thus formed mix readily with the cement and occupy space within the same and in this respect may be described as taking the place of gravel or rock now commonly used in the mixing of concrete in addition to sand. My mixture comprises suitable proportions of Portland or other cement, and foam and preferably sand. Of course, gravel may be also added if desired. In referring to cements I wish to state that this expression is intended to include clay, magnesite cement, plaster of Paris, keiselguhr and similar cementitious materials." Record, p. 186, ll. 11–29.

The final paragraph of the Specification is as follows:—

"I have indicated above a number of substances and methods for producing the foam or froth which is to be added to the mortar, but I wish it to be distinctly understood that my invention, in its broad aspects, is not limited thereto, inasmuch as any foam, no matter how made and no matter of what it may consist, falls within the scope of my invention." p. 189, ll. 21–25.

Claims 1, 2 and 3 of the Rice patent are as follows:—

1. "A shaped product comprising a mixture of cement material and tenacious stable foam." p. 189, ll. 27–34.

2. "The process of producing a cellular product which consists in mixing a tenacious stable foam with a cement material and allowing the mixture to harden."

3. "The process of producing a cellular cement composition which consists in mixing a gelatinous substance of foamy consistency with a plastic cement material and allowing the mixture to harden."

3. The grounds on which the patent was sought to be impeached were, that before the date of Rice's invention, the invention was made by one Erik Christian Bayer, and the evidence which the Appellants offered in proof of that submission was the Danish patent to Bayer issued in Denmark on the 2nd of July, 1923, on an application filed in Denmark on the

In the Supreme Court.

No. 25.
Factum of Christiani & Nielsen—
continued.

11th of September, 1922; and on the disclosure and use of the invention by Bayer in Denmark in the year 1921.

The earliest date of conception which Rice claimed was in the latter part of October, 1922.

Record, p. 81, ll. 32–35.
p. 164, ll. 32 *et seq.*

4. The Danish patent to Bayer is for "A Method of Manufacturing Porous Building Materials". Paragraphs 1, 2 and 3 of the Specification are as follows:—

(1) "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.

(2) "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.

(3) "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 the 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."

p. 165, ll. 15–26.

5. Claims 1, 2, 3 and 4 of the Bayer patent are as follows:—

(1) "Method of manufacturing porous building materials from substances, which are setting when mixed with water or other fluids, characterized by the fact that foamy substances from which foam is produced before the setting, for instance by the introduction of compressed air, or foam already developed from such substances, are added to the mixing fluid or to a mixture of same and the setting substance.

(2) "Method as stated in Claim 1 characterized by the fact that the foamy substance consists of a mucilage, for instance, tangin.

(3) "Method as stated in Claims 1 and 2, characterized by adding gelatine to the foamy substance.

(4) "Method as stated in Claims 1 and 3, characterized by adding formaldehyde to the foamy substance or to the foam."

6. The learned trial Judge in his Reasons for Judgment thus defines the invention claimed by Rice and Bayer :—

> "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 infinite 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."

Record, p. 100, l. 40. p. 101, l. 12.

7. In his evidence taken under commission in Denmark, the inventor, Bayer, says "From the year 1916 I have occupied myself with light concrete specially for the construction of concrete ships, and I possess a series of patents for manufacture of light concrete. The idea for the cellular concrete was conveyed to me about the new year 1921 by seeing my wife make a sponge cake, by seeing her mix the whipped white of eggs into the dough. I immediately went into my laboratory and my shaving soap being the most frothy substance I had at hand I used this to mix up with a cement composition, and it turned out that it immediately gave an excellent result. Later on I experimented with many different frothy substances." The inventor, Bayer, then goes on to state that his purpose in making these experiments and samples was to produce a very light and consequently insulating concrete and that the merit in the product was that because of the air spaces in it, a highly insulated material would result which might be used for many insulating and construction purposes. In 1921 Bayer also used in addition to soap, different kinds of mucilage, gelatine and gelatine mixed with formaldehyde, as bubble forming agencies. In the same year Bayer disclosed his invention and showed samples of the finished material to Carl Peter Wilhelm Jacobsen, former Professor at the Royal Technical High School at Copenhagen. Professor Jacobsen was interested in the invention and arranged that his Assistant, Erik Frank Philipsen, in consultation with himself, and working under the direction of Bayer, should carry on experiments, to determine

p. 13, ll. 23–32.

p. 14, ll. 7–11; p. 14, ll. 16–18; p. 14, ll. 23–36.

In the Supreme Court.

No. 25. Factum of Christiani & Nielsen— *continued.*

presumably, the various practical commercial uses to which the invention might be put.

The witness Philipsen says :—

" We made many sorts of experiments. We used the material for different kinds of cement, and with different kinds of foams, and tried how much water could be put together with the mixture.

Record, p. 16, ll. 4–17.

" 15. You made these experiments as a result of what Mr. Bayer told you and showed you to do ?—Yes, I did.

" 16. Did Mr. Bayer instruct you what to do ?—Partly, but I also made experiments on my own account. I took cement which I mixed with water and then we took the material for the mould, put it into the mortar where it remained until the next day. Then the mortar had set and we took it out of the form and left it till it hardened sufficiently.

" 17. What was the product ?—It was what we now call cell concrete.

" 18. Who was present when you made it ?—Mr. Bayer and Mr. Jacobsen and some pupils in the laboratory. Later on Engineer Schnadorph was present."

p. 20, ll. 16–17. 8. In June 1923, the Appellants commenced the commercial manufacture of the product covered by the Bayer patent. According to the evidence of one of the Appellants, Aaze Nielsen, the bubble forming agency was a soap to which glue was probably added.

p. 20, ll. 18–20. The business of the Appellants in the manufacture of porous concrete has developed on a large scale.

p. 105, ll. 35–43. 9. The learned trial Judge in his Reasons for Judgment (dealing only with the Bayer patent) says : " All Bayer discloses, it seems to me, is the bare idea that you can make 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 . . . . 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 the specification, then I think he had no invention, or had not completed his invention . . . . The specification as a whole, leaves me with the impression that Bayer's idea or invention was not a complete one, when the Danish specification was prepared."

p. 106, ll. 7–10.

p. 106, ll. 36–38.

For this reason the learned trial Judge dismissed the action.

PART II.

The Judgment of the learned trial Judge, it is submitted, is in error for the following reasons :—

10. Because he held that there was not in the Bayer patent a sufficient disclosure of the invention to anticipate the Rice patent in suit.

11. Because, failing to appreciate what was the invention, he did not hold that the numerous foam producing agents set out by Rice in his specification which might be employed in the making of foam, added nothing to the invention even if they were new; and that they were not new because they had either been disclosed by Bayer or were part of the common knowledge of the art at that time; and that in any event, they were not claimed by Rice as part of his invention.

12. Because he did not hold that the knowledge or use by Bayer and his associates in 1921, as disclosed in the commission evidence, was a complete knowledge and use of the invention covered by the Rice patent in suit.

13. Because he held that the question for determination was as to whether or not Bayer in his specification complied with the Statutory requirements of Section 14 of The Canadian Patent Act; and did not hold that the only question for determination was as to whether there was in the Rice patent under attack, subject matter, having regard to the prior knowledge and use by Bayer as disclosed in his patent and in the evidence taken on commission in Denmark, and having regard to the common knowledge of the art at that time.

PART III.

ARGUMENT.

14. The learned trial Judge, although he found identity of invention in the Rice and Bayer patents, held that the latter was not an anticipation of the patent in suit; and he says "the specification as a whole, leaves me with the impression that Bayer's idea or invention was not a complete one, when the Danish specification was prepared." Record, p. 100, ll. 33–44. p. 106, ll. 36–38.

It would appear, therefore, that in the opinion of the learned trial Judge, Bayer failed to disclose in his patent an operable means of carrying out his invention, and that Rice did disclose such means.

15. That Bayer did make an operable disclosure is, the Appellants submit, overwhelmingly supported by the evidence. p.29,l.17; p.32, l.20; p.47,l. 14; p.52, l.30; p.53. ll. 16–19.

The statements of the Appellants' witnesses at trial, MacRae and Thomson, are definite on this point. p. 54, l.5; p. 54, l. 44; p. 93, ll. 4–20; p. 95, ll. 11–19.

The Respondent's witness, Alexander, conducted a series of experiments with Irish moss (which Alexander evidently considered to be one of the foam producing agents mentioned in the Bayer specification) and made a foam p. 65, ll. 9–13; p. 65, ll. 33–44.

In the Supreme Court.

No. 25. Factum of Christiani & Nielsen—*continued.*

which he mixed with cement slurry to produce a porous cement; but in his opinion he did not get a successful result. It is difficult to reconcile the result of Alexander's experiments with the statements of the Appellants' witnesses as to their own successful operations under the Bayer patent unless the explanation of the witness Thomson, given in his rebuttal evidence, as to Alexander's failure, is accepted as the obvious one. Thomson says that Alexander did not add to his cement mix enough water to make possible the production of a porous cement product. Alexander, a chemist of repute, was without experience in the practical field of cement construction and so apparently fell victim to an elementary mistake which no trained workman would be likely to make. For this reason, it is submitted that the experiments of Alexander and his evidence relating to them, must necessarily be disregarded.

Record, p. 93, l. 34; p. 94, l. 9. p. 73, ll. 39–45.

16. The Appellants are not obliged to take the position that Bayer would have made a completed invention even had he not included in his specification any direction whatever as to the nature of the material from which foam appropriate for the purpose intended, could be made, because he did in fact suggest specific and practicable foam producing agents. But did the obligation to do so arise, the Appellants would confidently submit that the enumeration of foam producing agents was really gratuitous and that had the Bayer patent contained only a direction as to how a foam should be mixed with a cement, it would have disclosed the completed invention and the necessary means for carrying it out. For it was, of course, a matter of common knowledge at the time, that a stable foam could be made from a great many well known mucilaginous substances. The inventor under the patent in suit and the learned trial Judge apparently both agree with the Appellants' witnesses that this was so.

p. 27, l. 38; p. 28, l. 32; p. 31, l. 41; p. 33, l. 7; p. 48, l. 35; p. 49, l. 21; p. 49, ll. 34–45; p. 51, ll. 1–20; p. 52, l. 36; p. 54, l. 9; p. 92, l. 1; p. 93, l. 20; p. 88, ll. 28–38; p. 187, ll. 3–5; p. 105, ll. 35–39.

17. It follows therefore, that the enumeration by Rice in his specification of various foam producing agents, whether they were known or unknown, is, so far as concerns the invention claimed in the Rice patent, a matter of inconsequence.

If any of Rice's foam producing agents were novel in the patentable sense, then it was open to him to apply for a separate patent covering a method of producing foam by the use of such substances. But obviously, he could not (and indeed, he did not) seek protection of them under the patent in suit, nor could he suggest that their employment added anything to the disclosure of an invention for a method of making porous building materials by mixing a stable foam with a cementitious material.

As a matter of fact, however, in none of the claims of the Rice patent is mention made of any new foam producing agents which had not already been disclosed by Bayer, or which were not of common knowledge in the art. All the agents claimed are basically, mucilaginous. Indeed, it is difficult to suggest how or why anyone with an even passing knowledge of the prerequisites of the foam to be used in making the product constituting the invention, would suggest other substances.

So that there can be made, no real or fancied distinction between the invention disclosed by Bayer and the invention claimed by Rice.

The disclosure in the Rice specification of foam producing agents which possibly may not properly be termed mucilaginous, bears no relation to the patented invention, and comprises merely a compendium of suggestions palpably not compiled by a chemist (for Rice was not a chemist) and only of conceivable interest to one of the general public who might wish to explore the field of foam producing agents.

Record, p. 87, ll. 8–17.

18. In addition to his express ruling against the sufficiency of the Bayer Patent disclosure, the learned trial Judge failed to give effect to the undisputed evidence of the inventor Bayer and his associates taken on commission in Denmark, by which the Appellants submit, the following facts are established :—

p. 13, l. 28 to p. 14, l. 36.

In 1921, Bayer made his invention of mixing a foam with a cement to obtain a cellular or porous cement. He explained his invention to others. He exhibited to others his cellular cement product. As foam producing agents he used " first ordinary soap, different kinds of mucilage, gelatine and gelatine mixed with formaldehyde." Thereafter, with the assistance of Professor Carl Peter Wilhelm Jacobsen and Erik Frank Philipsen, he embarked on a long series of experiments, manifestly for the purpose of determining in detail, the types of porous cement products most suitable to the various requirements of the building trade. After carrying out a great number of experiments extending over a period of nearly a year, he filed on the 11th of September 1922, his Danish application for patent. This application did not contain a recital of all existing foam producing agents. The applicant, after his long period of experimentation, contented himself with stating that a suitable foam might be made from mucilaginous substances and that there might be added to that basic ingredient, gelatine and formaldehyde.

19. The learned trial Judge in his reasons for judgment says :— p. 106, ll. 22–35.

" 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 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 completed and conclusively established. The public should not be expected to travel the long experimental road

In the Supreme Court.

No. 25. Factum of Christiani & Nielsen— *continued.*

which Bayer and his assistants had traversed, if Bayer was to be granted a monopoly."

It is submitted with great respect, that the learned trial Judge, oblivious of the fact that Bayer, before he commenced these experiments, had actually made and exhibited a porous cement product, and oblivious of the further fact that an adequate foam could be and was, made from mucilaginous substances, failed to attach to these experiments their true significance. Instead of accepting them as so many tests to determine the various grades and textures of porous cement products which could be employed in the building trade, he chose apparently to regard them as a continuing attempt to perfect the details of foam making.

When there was common knowledge of a substance from which an adequate foam could be made, or when Bayer knew of this substance and actually used it, to make his invention, it is plain that even had Bayer continued to experiment with the same or other foam producing substances, such experiments could not have affected the fact that prior to making them, he had completed his invention when he mixed a foam with a cement and got a porous cement product. Consequently, the nature of the Bayer experiments is of little account except as evidence of repeated manufacture of the product covered by the Rice patent. But that as a matter of fact they were for the purpose which has been suggested, would appear evident.

The Bayer patent disclosure when contrasted with the disclosure of Rice, very well illustrates the practical and sufficient nature of the former. After he and his assistants had travelled what the learned trial Judge terms " the long experimental road," Bayer filed on the 11th of September 1922, his Danish application for patent. In this application he disclosed as foam producing agents, mucilaginous substances, gelatine and formaldehyde. These, he and his assistants had used. And at the end of his long period of work, there was apparently nothing which could be usefully added.

After at most, two months of experimental work, Rice in his Patent claimed nothing more than Bayer disclosed and claimed. But in addition, Rice disclosed a multitude of other foam making agents. His reason for doing so is not susceptible of satisfactory explanation. As he did not claim these additional agents, it would appear evident that he had neither faith in their utility nor belief in their novelty. That they were unknown to the art at the time seems improbable. That they were commercially employable seems uncertain. But that in any event, they added nothing new (even had they been claimed) to Bayer's practical disclosure of the invention claimed in the Rice patent, is clear beyond any possibility of doubt.

20. The learned trial Judge in his Reasons for Judgment says :

Record, p. 105, ll. 4–17.

" 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."

It is submitted, with great respect, that the learned trial Judge wholly failed to appreciate what was the issue before him for decision.

The question of the validity of the Bayer patent was not in issue. The question as to whether Bayer was entitled to a monopoly was not in issue. The only question in issue was whether the prior knowledge and use of the invention by Bayer, as established by the Danish patent and the commission evidence taken in Denmark, anticipated the patent to Rice. Or, to put the question in another way: whether with the knowledge and practice disclosed in the Bayer patent and in the commission evidence, and having regard to the common knowledge in the art at that time, Rice can be said to have made a patentable invention covering a method of manufacturing porous building material.

21. For the following reasons, the Appellants submit that Rice did not make an invention for which he was entitled to a patent:

(*a*) Because in September, 1922 (before Rice even conceived the idea underlying his later invention), Bayer filed in the Danish Patent Office an application on which a patent issued, which completely disclosed Rice's method of making a porous cement, and provided as well, practical means of carrying out this invention.

(*b*) Because Rice, in the patent in suit which is admittedly for the same invention as was made by Bayer, could not obviously have added anything to the invention by the mere elaboration of alternative agents for making a foam, even assuming that the various agents named by Rice (if indeed practicable) were not part of the common knowledge of the art.

(*c*) Because, even if at the time, there had not been known to the art, innumerable agents for producing a foam appropriate for the purpose intended under the patent, Rice does not claim any new agent for producing a foam which is not already broadly disclosed by Bayer.

(*d*) Because, even had Rice disclosed novel agents for producing a foam, these novel agents could not be included in a patent which was not for a method of producing a foam but was for cellular cement products and processes of making the same. All that the prior inventor was required to do was to clearly indicate a means of carrying out his invention. That and more, Bayer did.

(*e*) Because in any event, Rice disclosed nothing new over the Bayer patent disclosure and over the common knowledge in the art,

In the Supreme Court.

No. 25. Factum of Christiani & Nielsen—*continued.*

which amounted to invention. Consequently, there was no subject matter to support the patent to Rice.

(*f*) Because, apart from the Bayer patent disclosure, the commission evidence taken in Denmark establishes the fact that at the beginning of 1921, Bayer conceived the invention afterwards claimed by Rice; that during that year he disclosed it to others; and that he carried out experimental manufacture in the same year and produced the product, porous cement.

22. The Appellants therefore submit that the appeal should be allowed and the Judgment of the learned trial Judge reversed. 10

W. D. Herridge,
Of Counsel for the Appellants.

No. 26. Factum of John A. Rice.

No. 26

Factum of John A. Rice.

(*Note : Page references have been altered to agree with this Record.*)

PART I.

Statement of Case.

1. This is an appeal from the judgment of the Honourable Mr. Justice Maclean delivered on March 6th, 1929, dismissing the plaintiff's action to impeach a patent granted to the defendant on August 11th, 1925 20 (No. 252,546) on the ground that one Bayer, a Dane, had, in his own country, made the invention covered by the patent before it was made by the patentee.

2. The invention covered by the patent relates to a new building material consisting of a cellular concrete produced by mixing cementitious material, such as gypsum or cement, with a tenacious foam containing bubbles sufficiently strong to remain unbroken while the cement is being mixed and is setting.

3. The idea underlying the invention was suggested to the defendant by an item in the issue of the *Literary Digest* for October 21st, 1922, which 30 he read on or about the day of publication (p. 81, l. 40). This item proposed the manufacture of a cellular concrete by including wax in the mix and subsequently melting out the wax, and it suggested to the defendant the idea that if bubbles could be successfully used instead of wax, the second of these steps could be eliminated. He accordingly proceeded to make some experiments and obtained a satisfactory cellular product within about three weeks (p. 80, ll. 4–20).

4. An application for a United States patent was then promptly prepared and was filed on December 21st, 1922 (p. 80, l. 26) a priority date to

which the defendant's invention is entitled, independently of his own oral evidence, under the International Convention and Sec. 8 (2) of the *Patent Act* (p. 60, l. 9; p. 92, l. 16; p. 92, l. 23), which are printed as an appendix to this factum.

5. In the specification it is stated that the object of the invention is " to provide a cellular composition or product adapted to be used in walls . . . and that is not only considerably lighter in weight than the concrete mixtures now commonly used but . . . contains a large number of cellular voids adapted to improve the heat insulating and sound insulating properties of the material " (p. 186, ll. 12–18). It is said that " the invention embraces especially a method of impregnating cement while in a dry or soft state with gas bubbles preferably produced by whipping a gelatinous substance in the presence of water into a foam or lather " (p. 186, ll. 18–21), and that " the bubbles thus formed mix readily with the cement and occupy space within the same " (p. 186, ll. 22–23). A number of formulæ for the preparation of the foam are given, the preferred one being " 1% glue, 98 4/5% water and 1/5 of 1% of formalin solution containing, say, abolt 40% of formaldehyde " (p. 186, ll. 41–43), the solution thus obtained being directed to be mixed in suitable proportions with the cement mixture or powdered cement material (p. 187, l. 10). Different claims cover generally a product consisting of a mixture of cement material and tenacious stable foam, and the process of forming that product by mixing a tenacious stable foam with a cement material and allowing the mixture to harden. There are also special claims covering the use of the specific formula given above (pp. 189–191).

6. The only ground upon which the patent is sought to be impeached is that one Bayer, a Dane, and not the defendant, was the first to make the invention. Bayer's evidence was taken on commission and his Danish and Canadian patent applications and patents were put in evidence, the Danish application and patent (Ex. 3, p. 161) as evidence of his date of invention, and the Canadian patent, which was issued to the plaintiffs as Bayer's assignees (Ex. 2, p. 180), in order to establish the plaintiffs' interest in impeaching the defendant's patent and their consequent right to proceed without issuing a writ of *scire facias*.

7. Bayer says that the idea of a cellular cement product to be produced by mixing foam with cementitious material occurred to him at the beginning of 1921 when he observed his wife beating eggs for a cake (p. 13, l. 26), and that he then commenced some experiments himself and discussed the idea with one Jacobson, a professor at the Royal Technical School in Copenhagen (p. 13, l. 41), and one Philipsen, an assistant professor at the same school, to whom he produced small blocks of porous concrete he had made (p. 16, l. 1). He states that in the experiments he made in 1921 he used foams produced with " ordinary soap, different kinds of mucilage, gelatine and gelatine mixed with formaldehyde " (p. 14, l. 16), and also with some organic substances, among others fermented solutions of sea-tang (or sea weed) and of tangin (p. 14, ll. 19–22). With some of such organic substances he was not successful (p. 14, ll. 19–20), the only success he had in producing a cellular

product having, so far as appears, been with a soap foam (p. 14, l. 4). He was unable to say what percentage of soap was used in his mixtures (p.15, l. 6).

8. Jacobsen, to whom Bayer brought his samples, says that he had no trouble to make a foam, but that in the course of " our experiments we have made it better and better " (p. 19, l. 26). He puts the position thus :— " There are many different stages, the first stage is to have the idea clear, the idea here is the foam and paste, and after this you have to develop such a thing. It is necessary to try all the different possibilities of variation, and here you have many possibilities " (p. 19, ll. 31–34). Of the work he did, however, he kept no record and does not give any account, not even saying that he succeeded in making a cellular product. He provided Bayer with a laboratory to work in (p. 19, l. 35) and asked his assistant, Philipsen, to assist the latter in his experiments (p. 16. l. 2).

9. Phillipsen says that " there are innumerable ways of mixing cement, foam and water together " (p. 17, l. 13), and that he made " many sorts of experiments . . . with different kinds of foam " (p. 16, l. 4), estimating the number of these as " perhaps 1000 to 5000, but I think it was around 1000 " (p. 17, l. 22). He produced certain note books containing references to twenty-five experiments (Ex. 4, pp. 155–160), others having been recorded, as he states, in other note books which were probably later destroyed (p. 17, l. 24). The available records of experiments, as extracted and translated, are not in chronological order. They, however, record experiments dated in December, 1921 (p. 155–160), and in 1922 in the months of January (p. 160), March (p. 156–158), June (p. 156), September (p. 158) and October (p. 159). All that Phillipsen says about the result of his experiments, recorded and unrecorded, is that as a result of some of them he obtained a product which " was what we now call cell concrete " (p. 16, l. 14), without, however, giving any indication of the materials or the formula he used in doing so.

10. Nielsen, one of the plaintiffs, was also called and said that he had manufactured the invention with success since 1923 (p. 20, l. 16), making use of a foam for which he could not give the formula but which he said was " something like soap and glue " (p. 20, ll. 28–35). The only other evidence as to the formula in commercial use is Phillipsen's statement that it was not that disclosed to him by Bayer (p. 16, l. 42).

11. On September 11th, 1922, during the course of the recorded experiments, Bayer made an application for a Danish patent, the specification being characterized by an extreme vagueness. The only portions of it which are relevant or material are the following paragraphs :

> " The invention relates to a method of manufacturing 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 " (p. 161, ll. 28–36). . . .

" As foamy substance different kinds of mucilage, for instance the mucilage obtained from sea-tang, 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 " (p. 162, ll. 7–13).

12. This Danish patent issued on June 19th, 1923 (p. 164, l. 20) and was acquired by the plaintiffs in the same year (p. 14, l. 43). Having regard to Sec. 8 (2) of the *Patent Act* and the International Convention, the date of this Danish application is, of course, immaterial from the point of view of priority since it was not until December 6th, 1924, that Bayer filed his Canadian application (p. 169, l. 21), the affidavit in support of which untruly alleged that the only other patent application which had been made was one filed in Germany on September 8th, 1923 (p. 168, ll. 1–5). The Canadian patent (Ex. 2, p. 180) is substantially the same as that issued in Denmark, except for the addition of a statement that, besides the substances referred to in the latter, " experiments have shown that soluble soaps, especially resin, soda or resin-potash soap, are well adapted " to secure the end desired, since " such soaps possess the power of developing a very stiff and durable foam, which is highly adapted to be mixed with the materials without bursting the foam bubbles " (p. 182, ll. 32–34).

13. In addition to the introduction of the commission evidence, five witnesses were examined at the trial, namely, the defendant and four experts, two, McRae and Thomson, on behalf of the plaintiffs, and two, Alexander and Byrne, on behalf of the defendant. McRae was a graduate in chemistry, whose professional occupation was that of a patent solicitor. Thomson was a mining engineer who had been concerned with cement products for some years. Alexander was a consulting chemist and chemical engineer who was particularly concerned with colloidal chemistry and had edited a considerable text-book on that subject, of which the second edition was about to appear, and to which contributions had been made by eminent chemists throughout the world, including several winners of the Nobel prize. Byrne was a United States lawyer called only to prove the law of the United States.

14. On only two points was there any conflict of opinion between the scientific witnesses, those points being the meaning of the word " mucilage " and the occurrence of a chemical reaction between cementitious material and the bubble-forming agent. The witness McRae defined " mucilage " as meaning " any viscid or glutinous mixture of water and a vegetable extract " (p. 30, ll. 1–2), and Thomson gives a like general definition (p. 51, l. 29), differentiating mucilage, thus generally defined, from glue, which is an

In the Supreme Court.

No. 26. Factum of John A. Rice—*continued.*

animal product (p. 51, l. 29). Alexander, on the other hand, defined mucilage as a " viscous, aqueous solution made from a vegetable gum " such as gum arabic, gum tragacanth, Irish moss, or gum Karaya (p. 65, ll. 10–14), and excluded from this definition saponin or soap bark, which he considered not to be a vegetable gum but a glucoside (p. 78, l. 39), although it was treated by the other witnesses as coming within their general definition (pp. 29, 48, ll. 39). On the point of the chemical reaction between the foam-forming substances and the cementitious material, Rice said that one of the requisites of a satisfactory foamy material was that there should be no deleterious chemical reaction between it and the cement (p. 90, ll. 1–2), whereas Thomson said that there would be no such a reaction (p. 98, l. 1) and McRae did not think there would ordinarily be one, although one might occur in some cases (p. 98, ll. 22–30).

15. Apart from these differences of view, the evidence of these witnesses may be thus summarized:

(a) *McRae* said that foam-forming substances had been known for many years and that, in his view, Bayer's Danish specification, addressed as it was to ordinary working men, was quite sufficient to enable the process to be successfully followed (p. 25, ll. 3–16). He gave (verbally only), the results of some—but not of all (p. 46, l. 26)— of the experiments he had made in attempting to carry out Bayer's Danish specification, saying that he had obtained satisfactory results with saponin (p. 29, l. 20; p. 30, ll. 4–10) and also with ordinary laundry soap as a bubble-forming mixture (p. 30, l. 20; p. 30, ll. 41–43), but that he had entirely failed to get satisfactory results with glue, owing to the fact that the foam he obtained with this material was not sufficiently tenacious to stand up (p. 30, ll. 22–40). He had made no experiments with the only material mentioned in Bayer's patent, namely, the mucilage obtained from sea-weed or, as it is called in the patent " sea-tang " (p. 39, l. 26).

(b) *Thomson* said that he was familiar with foam-producing substances and had made certain investigations as to foams as early as 1922, although it was only in 1926 that he made some cellular concrete by mixing foam with cementitious material (p. 52, l. 28). He thought that he had then made a real invention and was disappointed to find that it had been anticipated (p. 50, l. 4). In his experiments he had made successful use of saponin (/p. 51,l. 30 and 44), and, after some experiment, with Irish moss (p. 96, l. 2), but either refused or was unable to give the formula with which his successful results had been obtained (pp. 55–59; p. 95, l. 27).

(c) *Alexander* said he had made a number of experiments with a view to securing a satisfactory result by following Bayer's specification (p. 73, l. 11). For the purpose, he had selected Irish moss as being the mucilage best adapted for the purpose proposed (p. 65, l. 37; p. 76, ll. 24–34), and as being the only sea-weed mucilage readily obtainable (p. 65, ll. 15–32). From this he had made up a number of different

solutions, each of which he mixed with the same amount of plaster of paris and of cement. Like quantities of plaster of paris and of cement without any bubble-forming agent had also been mixed and allowed to set (Ex. B, Nos. 1 and 5; p. 67, ll. 25–28) so that the results obtained with the foam solutions might be readily compared by the mere inspection of the comparative size of the resulting masses (p. 68, ll. 8–20; p. 72, ll. 22–29). The desired cellular formation was not obtained with any of three solutions of Irish moss alone, the unsuccessful results with plaster of paris being shown by three exhibits (Ex. B, Nos. 2, 3 and 4) and with cement by another three (Ex. B, Nos. 6, 7 and 8, pp. 68, ll. 21–69, l. 5). He then made similar experiments with a foam solution containing a mixture of Irish moss and gelatine or glue, succeeding no better than with the Irish moss alone when the proportion of gelatine to Irish moss was as one to six (Ex. B, No. 11; p. 69, ll. 31–42), but somewhat better when the amount of gelatine was made almost equal to the amount of Irish moss (Ex. B, No. 12; p. 69, ll. 42–p. 70, l. 10). This improved result was not, in his opinion, as Bayer's specification suggests, because of the increased durability of the Irish moss foam due to the presence of gelatine, but primarily because the gelatine was itself a foam-producing substance (p. 70, l. 10). He also made similar quite unsuccessful experiments with ivory soap (Ex. B, Nos. 9 and 10; p. 71, l. 4–19), but got quite satisfactory results with Rice's formula (Ex. B, Nos. 13, 14, 15 and 16; p. 71, ll. 20–p. 72, l. 10). The experiments represented by the exhibits referred to were all those that had been made (p. 72, l. 44; p. 76, l. 21). Finally, Alexander stated that the Bayer specification was entirely in error in suggesting that the addition of formaldehyde to a sea-weed solution could effect the durability of the foam (p. 70, ll. 33–71, l. 3).

(d) *Rice* explained that the requisites of a satisfactory foam were (1) that its bubbles should be sufficiently strong and lasting to resist crushing during the process of mixing and not to deteriorate until after the cement had set (p. 88, l. 42); (2) that the foam should not be affected by the chemical action of the cementitious material upon it; and (3) that it should not itself chemically affect the cement so as to impair its ultimate strength (p. 89, l. 42). He stated that at the time the idea suggested itself to him he knew " that foam could be made from soap and a great many known substances ", but that he " did not know that these foams would be suitable by mixing in a Portland cement " (p. 85, l. 37). His first experiments were made with a gelatine (p. 80, l. 7), with which he was unsuccessful, but he later succeeded with the formula given in his patent (p. 80, l. 15), and subsequently to the application for it, he tried other materials (p. 80, l. 40), without obtaining any other formula which would give a better concrete (p. 80, l. 46).

16. On this evidence the learned trial Judge concluded that, even when Bayer's Danish specification was filed on September 11th, 1922,

In the Supreme Court.

No. 26. Factum of John A. Rice—*continued.*

nearly two years after the idea had originally occurred to him, the invention was still incomplete, and that neither in that specification nor in his Canadian specification had Bayer given the information necessary for the successful practice of the invention. He therefore held that the defendant's invention (which was reduced to practice in November 1922 and in respect of which United States patent application was filed on December 11th in that year) had not been anticipated by Bayer. In view of this conclusion the learned trial Judge, found it unnecessary to consider whether, if he had found Bayer's invention to be complete before the defendant's, the latter's patent might nevertheless be valid, having regard to the fact that there was no publication by Bayer until after the defendant had applied for and obtained his patent.

PART II.

Points for Argument.

17. The following questions arise:

(1) Whether the learned trial Judge was wrong in holding that the plaintiffs had failed to establish that Bayer's invention was complete at a date earlier than that at which the defendant's was so;

(2) Whether, in any event, the defendant's patent can be set aside having regard to the fact that it covers the use of materials and of a specific formula nowhere suggested by Bayer; and

(3) Whether, even if it had been established that both Bayer and the defendant had made identically the same invention and that Bayer had made it first, the defendant's patent should be set aside, having regard to there having been no publication by Bayer of his invention in Canada or elsewhere until after the defendant's patent had issued.

PART III.

Argument.

(1) *Have the plaintiffs established that Bayer's invention antedated that of the defendant?*

18. It is submitted that the learned trial Judge's finding on this point, after hearing the witnesses, is fully supported by the evidence and should not be disturbed. The mere idea of mixing foam with cementitious material in order to form a porous concrete does not by itself constitute invention. A practical and useful application of the idea must have been worked out. All that Bayer's specification really says is that by " a suitable choice of . . . substances " it is " possible to produce a foam which, during the . . . shaping of " a concrete material with which the foam has been mixed " is of such a durability that a great number of air bubbles are left in the mass " (p. 161, ll. 33–36). In the defendant's submission, that does not constitute invention in a legal sense, with the result that, since the defendant was the first to develop a satisfactory formula and technique,

he first completed a patentable invention and is entitled to his patent: *Pope* v. *Spanish River* (1928), 46 R.P.C. 23 (P.C.), at p. 55.

19. It does not lie in the mouth of the plaintiffs to say that Bayer's Danish patent application was a dishonest one; they must take the position that it was an honest disclosure, and since it appears from the plaintiffs' evidence that Bayer and his coadjutors had already tried many foam producing materials, it must be inferred that Bayer thought that none of these were practically useful except mucilage. It is, however, open to the defendant to show that, even with respect to this material, the information given was inadequate or inaccurate and misleading, and ask accordingly that it be inferred that the invention had not been completed. Such evidence the defendant furnished and it was accepted by the learned trial Judge.

20. Bayer's Danish application contains nothing more than the statement of a principle. It gives no formula and the only material (sea-weed mucilage) of which it suggests the use failed in the hands of Alexander, the defendant's witness, whose qualifications to succeed with it were beyond exception (pp. 62–63). That Bayer's inventive efforts had not at any material time progressed beyond a purely experimental stage is, moreover, confirmed by the evidence taken on commission. As Jacobsen says in his evidence, already quoted, it is one thing to formulate an idea and another to develop the thing (p. 19, ll. 31–34), and, even if the recorded experiments made by Philipsen, a number were carried out at a date subsequent to September 11th, 1922, when Bayer's patent application was filed (pp. 158–159). How many of the unrecorded 975 or more were so does not appear.

21. It is also to be observed that the material referred to in twelve of the recorded experiments is merely " foam," no formula for its preparation being indicated. In three others it is " casein " and in five others " glue," the records of the remaining five experiments making no reference whatever to the foam producing substances (Ex. 4, pp. 155–160). None of the recorded experiments relates to the sea-weed mucilage or tangin, to which alone the patent application refers. This material is not used in the commercial process (p. 20, ll. 24–34) and apparently was never successfully used even by Bayer or his coadjutors, since the only reference to it in the evidence is Bayer's own statement that it was one of several organic substances which he used and which " turned out not favourable for this purpose " (p. 14, ll. 19–22). While Bayer had, perhaps, made slightly more progress than the inventor whose invention was in question in *Permutit* v. *Borrowman*, 43 R.P.C. 357, Bayer had, in the defendant's submission, not gone far enough at any relevant time to permit it to be said that his invention was complete.

22. Further evidence in confirmation of this conclusion is to be found in Alexander's uncontradicted evidence that the addition of formaldehyde to the sea-weed foam solution could not affect the durability of the foam (p. 70, ll. 33; p. 71, l. 3), as the specification states that it would do (p. 162, ll. 12–13), and that its only effect would be to prevent the decomposition of

In the Supreme Court.

No. 26. Factum of John A. Rice—*continued.*

the solution (p. 70, ll. 33–45), especially when this evidence is compared with the only statement made by Bayer or his assistants on the subject of the use of this material which is that Bayer used *fermented* solutions of sea-tang and tangin (p. 14, l. 21) without success (p. 14, l. 20), a failure which, as Alexander says, was to be expected (p. 70, ll. 35–45).

23. The question whether or not Bayer had a completed patentable invention may be tested by asking whether his specification would have been sufficient to support a valid patent to him if it had been issued before that granted to Rice. In the defendant's submission, the answer must be in the negative since the specification left anyone who depended upon the specification to experiment in order to obtain a successful result and was also positively misleading. See *Vidal Dyes* v. *Levinstein* (1912), 29 R.P.C. 245 (C.A.), at pp. 271–2, 279–80, 280–1; *Natural Colour* v. *Bicschemes* (1915), 32 R.P.C. 256 (H.L.), at p. 270.

24. Briefly stated the position of the defendant on this branch of the case is (1) that Bayer's specification is quite correct in stating that by making " a suitable choice " among foam producing agents, a useful cellular concrete can be produced, (2) that the invention, as distinguished from the abstract idea, lies in determining what that choice should be, (3) that not only have the plaintiffs failed to show that Bayer's choice of any mucilage but preferably a sea weed mucilage, was a suitable one, but the defendant has shown affirmatively that it was not so, and (4) that Bayer was so far wrong in his idea that he erroneously thought that the addition of formaldehyde to the mucilage increased the durability of the foam which might be produced therefrom.

(2) *Is the defendant's patent not in any event good as covering his selected formula?*

25. With this point the learned trial Judge did not find it necessary to deal. Bayer only suggests the use of a mucilage such as that derived from sea-weed, perhaps mixed with gelatine and/or formaldehyde, without giving any formula. The defendant, on the other hand gives a precise formula and, in his submission, his patent for the use of that formula, which proposes the use of materials entirely different from those suggested by Bayer, affords a firm foundation for a valid patent which should not be set aside even if the finding of the learned trial Judge as to the completion of Bayer's invention were reversed.

26. On this point the defendant relies on *Osram Lamp Works* v. *Pope* (1917), 34 R.P.C. 369 (H.L.), particularly at pp. 384, 396–7, 404, where it was held that in the case of a patent for a particular means of achieving an old result, the test to be applied is whether, in view of common knowledge, the means proposed in the patent would, without it, be obvious to the persons to whom the specification was addressed. It is indisputable that resort to the defendant's proposed materials and formula, was not obvious. So far from its being obvious, apart from the defendant's patent, that a satisfactory product would be obtainable by the use of any formula for a

foam forming substance based on glue, it appears that McRae, one of the plaintiffs' expert witnesses, wholly failed with that material (p. 30, ll. 22–37) although the defendant succeeded without difficulty by using exactly the same glue (Lepage's) in the proper solution (p. 81, ll. 2–27).

(3) *Whether the defendant's patent must not be held valid, even if both the preceding points were decided in favour of the plaintiffs.*

27. This third question is relevant only on the assumption that Bayer made exactly the same invention as the defendant and was the first to make it. It depends upon the fact that at the date of the defendant's making his United States application for patent (Dec. 21st, 1922) there was no public knowledge anywhere of Bayer's invention. The learned trial Judge refers to the point (p. 107, ll. 1–18), but thought it was not necessary for him to consider it in view of his finding on the first question discussed above.

28. Excluding from consideration the locality of invention on the ground that this is irrelevant in view of the decision in *Wright and Corson* v. *Brake Service* (1926), S. C.R. 434, there remains the serious question whether of two investigators working along parallel lines that one who first applies for and obtains a patent is subject to being deprived of his patent rights by a rival who subsequently establishes that his investigations had reached the point of a completed invention at an earlier date than that at which a like stage had been reached by the more diligent patentee.

29. On this point the English law was settled very early in *Dolland's Case* (1758), 1 Webs. Pat. Cas. 43, the Court's decision being thus stated :—

> " The objection to Dolland's patent was, that he was not the inventor of the new method of making object glasses, but that Dr. Hall had made the same discovery before him. But it was holden, that as Dr. Hall had confined it to his closet, and the public were not acquainted with it, Dolland was to be considered as the inventor."

So in *Forsyth* v. *Riviere*, 1 Webs. Pat. Cas. 97, *note*, Abbott, C. J., is said to have held that :

> " If several persons simultaneously discover the same thing, the party first communicating it to the public under the protection of letters patent becomes the legal inventor, and is entitled to the benefit of it."

So in *Cornish* v. *Keene* (1835), 1 Webs. Pat. Cas. 501, Tindal, C. J., directed the jury as follows :—

> " A man may make experiments in his own closet for the purpose of improving any art or manufacture in public use; if he makes these experiments and never communicates them to the world, and lays them by as forgotten things, another person, who has made the same experiments, or has gone a little further or is satisfied with the experiments, may take out a patent, and protect himself in the privilege of the sole making of the article for fourteen years; and

it will be no answer to him to say that another person before him made the same experiments, and therefore that he was not the first discoverer of it—because there may be many discoverers starting at the same time, many rivals that may be running on the same road at the same time, and the first which comes to the Crown and takes out a patent, it not being generally known to the public, is the man who has a right to clothe himself with the authority of the patent, and enjoy its benefits."

In a Scotch action for infringement, *Smith* v. *Davidson* (1857), 19 Ct. of Sess. 2nd Ser. 691 at p. 698, the Lord President (McNeill), giving in effect the judgment of the Court, expressed himself thus :—

" When a patent is validly granted—it is held in law to be a valid patent—then I think that the party who obtains the patent is held to be the owner of that invention described in the letters patent. It is held in law to be his invention. A monopoly of it is given to him as being his invention, because he is the party who has given to the public that invention. He has given it to the public under the condition that he shall obtain a monopoly, and so it comes to be his invention in that sense. The discovery is not the thing the public have an interest in; what they have interest in is that they shall have the benefit of that invention. A party may live and die, taking the knowledge of his invention with him, but the disclosure of the invention and the means by which it shall be put into use, are the conditions on which he obtains a monopoly of it from the public, and the party who comes forward and complies with that condition, being himself the true inventor, gets the right to the monopoly of that invention. It becomes his invention in law. The consequence is that his invention must be protected, and although there may be others who have made the discovery but who have not brought it to the same perfection and have not made their bargain with the public with regard to it, they cannot disturb the monopoly of the party who first makes his bargain with the public."

In *Ex parte Henry* (1872), 8 Ch. App. 167, a reference as between conflicting patent applications, the Lord Chancellor (Lord Selborne) said (at p. 170) :—

" I apprehend that it would be no answer to a *bona fide* application for a patent, who has himself by his own ingenuity, made a useful invention, and has applied for a patent before any one else claiming to have made the same invention—it would, I say, be no answer to him, assuming the absence of fraud, or communication to allege that experiments had been going on, or even drawings made, by another inventor. One person, being a *bona fide* inventor, comes first to ask for a patent for his invention, and such allegations are no answer to him. If a patent were granted to him it would date from the day of his application. If he were the true inventor, the circumstances of something having taken place somewhere else which was not disclosed

to the world, and as to which no prior application was made, would be no answer to him, even if it could be shown that the two inventors were travelling very much upon the same lines and that their minds were going very much to the same point at the same time."

And in *Plimpton* v. *Malcomson* (1876), 3 Ch. D. 531, Jessel, M. R., said (at p. 555) :—

"Suppose there were two people, actual inventors in this country, who invented the same thing simultaneously, could either be said to be the first and true inventor? It was decided that the man who first took out the patent was the first and true inventor. Then there was another point. If the man who took out the patent was not, in popular language, the first and true inventor, because somebody had invented it before, but had not taken out a patent for it, would he still, in law, be the first and true inventor? It was decided he would, provided the invention of the first inventor had been kept secret, or, without being actually kept secret, had not been made known in such a way as to become a part of the common knowledge, or of the public stock of information. Therefore, in that case also, there was a person who was legally the first and true inventor, although, in common language, he was not, because one or more people had invented it before him, but had not sufficiently disclosed it."

30. The United States law on the point is not entirely clear. The United States Supreme Court in *Pennock* v. *Dialogue* (1829), 2 Pet. 1 at p. 19, said that the true meaning of the expression in the Act of 1793 " not known or used before the application " must not be known or used *by the public.* The law was, however, changed by the Act of 1836, particularly by the provision of Sec. 15 which permitted an alleged infringer to plead that " the patentee was not the original and first inventor or discoverer of the thing patented," and, having regard to the terms of that section and secs. 7, 8, 13 and 16, Story, J., in *Reed* v. *Cutter* (1841), 1 Story 590, refused to follow *Dolland's Case* above referred to, and held that the United States law differed from that of Great Britain. The opposite view seems to be inferable from the remarks in *Brush* v. *Conduit* (1889), 132 U.S. 39, and the three most recent decisions are *Black* v. *Natham* (1925), 9 Fed. 2nd, 311, *Standard* v. *Keefer* (1925), 18 Fed. 2d. 326, 331, and *Milburn* v. *Davis* (1926), 270 U.S. 390. In the last mentioned the question was as between the earlier of two inventors, who was also the earlier to disclose the invention in a patent application, in which, however, the invention was not claimed, and a later inventor who both disclosed and claimed it in a later application. The Court held the latter's patent invalid, basing its judgment upon the phrase in U.S.R.S. Sec. 4920 corresponding to that cited above from the Act of 1836 as the principal ground for the decision in *Reed* v. *Cutter*, and to that phrase there is nothing analogous in the English or Canadian statutes. Reference may also be made to *Robinson on Patents* (1890), ss. 58, 226, 320 and 321, from which it would appear that at least up

In the Supreme Court.

No. 26. Factum of John A. Rice—*continued.*

to that date, there was no wide difference between the English and United States law, notwithstanding the differences in the phraseology used in the legislation.

31. The principle laid down and applied in the English decisions was discussed and adopted by Maclean, J. in *Gerrard* v. *Cary* (1926), Ex. C.R. 170, and the defendant submits that that principle is as fully applicable to the words of the Canadian *Patent Act* as to those used in Section 6 of the *Statute of Monopolies.* Under the latter Statute valid letters patent may be granted only " to the true and first inventor and inventors " of " any manner of new manufactures " which " others at the time of the making of such letters patent and grants shall not use." There appears to be no greater reason for giving any different effect to the expressions used in Section 7 of the *Patent Act* which authorise the issue of a patent to " any person who has invented any new " manufacture " not known or used by others before his invention thereof." The only differences between the two statutes are (*a*) that under the former the relevant date is that of the grant, whereas under the latter it is the date of invention, and (*b*) that the former refers only to use while the latter refers to either use or knowledge. For the present purpose, the first of these differences is obviously immaterial and the second appears to be equally so since, if private or secret use does not constitute a bar, there is no ground for a conclusion that private or secret knowledge was intended to do so.

32. The point is also referred to in the judgment of the Privy Council in *Pope* v. *Spanish River* (1928), 46 R.P.C. 23, where Lord Dunedin says (p. 55) :—

> " There are many instances in various branches of science of independent investigators making the same discovery. That does not prevent the one who first applies and gets a patent from having a good patent, for a patent represents a *quid pro quo.* The *quid* to the patentee is the monopoly ; the *quo* is that he presents to the public the knowledge which they have not got. That knowledge the other inventor has kept sealed in his own breast, and he therefore cannot complain that his rival got the patent."

33. Any other conclusion would be very seriously contrary to the public interest. An inventor who considered the time unripe for the exploitation of his invention could withhold its disclosure, calmly await his opportunity and not only invalidate an independent inventor's subsequent patent, but obtain one himself when he found that it was impossible longer to withhold the invention from the public. The result would be that the validity of patents would, contrary to public policy, be made unnecessarily uncertain and that, instead of the public's getting early knowledge of inventions in consideration of the grant of monopolies, the statutory term of any given monopoly might begin only when the same invention had been made by at least two people and one of them (perhaps the latter to invent) considered the time ripe for an application for patent.

34. A decision in a sense opposite to that for which the defendant contends would also involve the conclusion that sec. 8 (2) of the *Patent Act* is entirely without meaning. There is nothing except the right of a subsequent inventor who is the first to make an application in Canada which could intervene to affect the rights consequent upon the making of an application abroad, and if the foreign applicant does not gain something as against an independent Canadian applicant by making his application within a twelvemonth, there is no field left for the operation of this provision.

O. M. Biggar,

R. S. Smart,

Of Counsel for Respondent.

APPENDIX OF STATUTES.

The Patent Act.

R.S.C. (1927) c. 150, sec. 8.

8.—(1) Any inventor who elects to obtain a patent for his invention in a foreign country before obtaining a patent for the same invention in Canada, may obtain a patent in Canada if the patent is applied for within one year from

(*a*) the earliest date on which an application for a patent for the invention was filed in any foreign country, or

(*b*) the thirteenth day of June, one thousand, nine hundred and twenty-three, if no patent has been issued on a foreign application for the invention for more than one year.

(2) An application for patent for an invention filed in Canada by any person who has previously regularly filed an application for a patent for the same invention in a foreign country which by treaty, convention or law affords similar privilege to citizens of Canada, shall have the same force and effect as the same application would have if filed in Canada on the date on which the application for patent for the same invention was first filed in such foreign country, provided the application in this country is filed within twelve months from the earliest date on which any such foreign application was filed, or from the thirteenth day of June, one thousand, nine hundred and twenty-three.

(3) No patent shall be granted on an application for patent for an invention which had been patented or described in a patent or printed publication in this or any foreign country more than two years before the date of the actual filing of the application in Canada, or which had been in public use or on sale in Canada for more than two years prior to such filing.

In the Supreme Court.

No. 26. Factum of John A. Rice—*continued.*

INTERNATIONAL CONVENTION FOR THE PROTECTION OF INDUSTRIAL PROPERTY, SIGNED AT THE HAGUE, NOVEMBER 6TH, 1925, RATIFIED BY THE DOMINION OF CANADA ON APRIL 19TH, 1928.

ARTICLE 4.

(*a*) Any person who has duly deposited an application for a patent, or for the registration of a utility model, industrial design or model or trade mark in one of the contracting countries, or his legal representative or assignee, shall enjoy, for the purposes of deposit in the other countries, and reserving the rights of third parties, a right of priority during the periods hereinafter stated.

(*b*) Consequently, a subsequent deposit in any of the other countries of the Union before the expiration of these periods shall not be invalidated through any acts accomplished in the interval, either, for instance, by another deposit, by publication or exploitation of the invention, by the putting on sale of copies of the design or model, or by use of the mark.

(*c*) The above-mentioned periods of priority shall be twelve months for patents and utility models, and six months for industrial designs and models and trade marks.

These periods start from the date of deposit of the first application in a country of the Union; the day of deposit is not included in the period.

If the last day of the period is a *dies non* in the country where protection is claimed, the period shall be extended until the first following working day.

(*d*) Any person desiring to take advantage of the priority of a previous deposit shall be bound to make a declaration giving particulars as to the date of such deposit and the country in which it was made. Each country will determine for itself the latest time at which such declaration must be made.

These particulars shall be mentioned in the publications issued by the competent authority, in particular on the patents and the specifications relating thereto.

The contracting countries may require any person making a declaration of priority to produce a copy of the application (with the specification, drawings, etc.) previously deposited. The copy, certified as correct by the authority by whom the application was received, shall not require any legal authentication, and may in any case be deposited at any time within three months from the deposit of the subsequent application. They may require it to be accompanied by a certificate from the proper authority showing the date of the deposit, and also by a translation.

No other formalities may be required for the declaration of priority at the time of depositing the application. Each of the contracting countries shall decide for itself what consequences shall follow the omission of the formalities prescribed by the present article, but such consequences shall in no case be more serious than the loss of the right of priority.

Subsequently, further proof in support of the declaration may be required.

(*e*) Where an application for the registration of an industrial design or model is deposited in a country in virtue of a right of priority based on a previous deposit of an application for registration of a utility model, the period of priority shall only be that fixed for industrial designs and models.

Further, it is permissible to deposit in a country an application for the registration of a utility model in virtue of a right or priority based on the deposit of a patent application and vice versa.

(*f*) If an application for a patent contains multiple priority claims, or if examination reveals that an application contains more than one invention, the competent authority shall at least authorize the applicant to divide the application, subject to such conditions as may be imposed by domestic legislation, and preserving as the date of each part of the application the date of the initial application, and, if necessary, the benefit of the right of priority.

No. 27.

Formal Judgment.

No. 27. Formal Judgment, 9th May 1930.

IN THE SUPREME COURT OF CANADA.

Friday the 9th day of May, A.D. 1930.

Present :

The Right Honourable FRANCIS A. ANGLIN, P.C., C.J.C.
The Right Honourable Mr. JUSTICE DUFF, P.C.
The Honourable Mr. Justice NEWCOMBE,
The Honourable Mr. Justice RINFRET,
The Honourable Mr. Justice LAMONT.

Between

FRITS RICDOLF CHRISTIANI and AAZE NIELSEN, trading under the name firm and style of Christiani & Nielsen, and the said CHRISTIANI & NIELSEN - - - - (*Plaintiffs*) *Appellants.*

and

JOHN A. RICE - - - - - - - - (*Defendant*) *Respondent.*

The appeal of the above-named Appellants from the Judgment of The Exchequer Court of Canada rendered in the said cause on the sixth day of March, in the year of Our Lord One thousand nine hundred and twenty-nine, having come on to be heard before this Court on the thirteenth, fourteenth and fifteenth days of November, in the year of Our Lord, One thousand nine hundred and twenty-nine in the presence of Counsel as well

In the Supreme Court.

No. 27. Formal Judgment, 9th May 1930—*continued.*

for the Appellants as for the Respondent, whereupon and upon hearing what was alleged by Counsel aforesaid, this Court was pleased to direct that this appeal should stand over for judgment, and the same coming on this day for Judgment.

This Court did Order and Adjudge that the said appeal should be and the same was allowed, that the said Judgment of The Exchequer Court of Canada should be and the same was reversed and set aside and that Letters Patent Number 252,546 granted John A. Rice by the Patent Office of the Dominion of Canada, be and the same are hereby declared invalid and ordered to be cancelled.

And this Court did further Order and Adjudge that the Respondent do pay the costs as well in this Court as in the Exchequer Court of Canada.

(Signed) E. R. Cameron,
Registrar.

No. 28. Reasons for Judgment, Rinfret, J. (concurred in by Anglin, C.J.C., and Duff, Newcombe and Lamont, JJ.), 9th May 1930.

No. 28

Reasons for Judgment.

Delivered May 9th, 1930.

RINFRET, J. (CONCURRED IN BY ANGLIN, C.J.C., AND DUFF, NEWCOMBE AND LAMONT, J.J.).

The appellants are manufacturers of Copenhagen and they own, by assignment from Erik Christian Bayer, Canadian patent No. 265,601, issued on the 9th of November, 1926, for " processes of manufacturing porous building material." They were plaintiffs in the Exchequer Court and sought to impeach Canadian patent No. 252,546 for " cellular cement " products and processes of making same," issued on a date anterior to that of the appellants' patent, to wit: on the 11th of August, 1925, and owned by the respondent, who was the defendant in the court below.

The particular objection on which the appellants relied was that Rice was not the true and first inventor of the process described in his patent, because, prior to the date of his alleged invention, the same process had been invented by Bayer, in Copenhagen, and formed the subject matter of a patent issued in Denmark on the 2nd of July, 1923.

The action was dismissed and is now brought to this court by way of appeal.

The invention claimed by Bayer and Rice relates to a new building material consisting of a cellular concrete produced by mixing cementitious material, such as gypsum or cement, with a tenacious foam containing bubbles sufficiently strong to remain unbroken while the cement is being mixed and is setting. " 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 improve the " heat insulating and sound insulating properties of the finished material."

The process thus consists in mixing a stable foam with a cement and in regulating the porosity by the simple expedient of making this foam mechanically rather than developing it chemically. It is identical in the Bayer patent and in the Rice patent. The product is the same in the one as in the other. And the trial judge found that " both Bayer and Rice " had the same idea in mind." In fact, it was conceded at bar that both processes are the result of the same conception and the same invention in the popular sense.

The judgment appealed from also found that each inventor " was in good faith " and that " they were working independently of each other." The only question for determination therefore was: As between the two, who was the first inventor in the legal sense; and the judgment held that it was Rice.

The decision of that question involves a consideration of Section 7 of Chapter 23 of the Statute of 1923, which was the legislation current at the time of the grant to Rice. It is as follows :—

" 7. (1) Any person who has invented any new and useful art, " process, machine, manufacture or composition of matter, or any " new and useful improvements thereof, not known or used by others " before his invention thereof, and not patented or described in any " printed publication in this or any foreign country *more than two* " *years prior to his application* and not in public use or on sale in " this country for *more than two years prior to his application* may, " on a petition to that effect, presented to the Commissioner, and " on compliance with the other requirements of this Act, obtain a " patent granting to such person an exclusive property in such " invention.

" (2) No patent shall issue for an invention which has an illicit " object in view, or for any mere scientific principle or abstract " theorem."

It may be convenient to point out that the wording is different in some respects from that of the corresponding section in the Patent Act as contained in the Revised Statutes of 1906, and we shall have to consider how far, if at all, the effect of previous decisions is modified by the amendments made by Parliament. It will at once be noticed that, in the new section, the public use or sale for more than two years (N.B. in the Statute of 1906, it was one year) prior to the application is now expressly stated to be public use or sale " in this country," thus indicating on that point anticipation by Parliament of the judgment in *Pope Appliance Corporation* v. *Spanish River Pulp and Paper Mills Limited* (1929 A.C. 269). A further change is that consent or allowance of the inventor is no longer essential to make public use or sale in Canada, previously to the application, a bar to the valid grant of a Canadian patent.

That part of the section, however, has no bearing upon the present litigation. Suffice it to say that, on the facts, it is abundantly clear that the

In the Supreme Court.

No. 28. Reasons for Judgment, Rinfret, J. (concurred in by Anglin, C.J.C., and Duff, Newcombe and Lamont, JJ.), 9th May 1930—*continued.*

appellants cannot rely on it for the purposes of their case. But the other parts of the section must receive careful examination.

We are now dealing with a process and may limit our discussion to that species of invention. Under section 7, to form a valid subject matter of a patent, a process must, of course, be useful—and the utility of Rice's process is not disputed. It must also be new and its novelty must be such that it was "not known or used by others before the invention thereof " and not patented or described in any printed publication in this or any " foreign country more than two years prior to (the) application." The validity of Rice's patent depends on the interpretation of this part of the enactment and its application to the particular facts.

The words "not patented or described in any printed publication in this or any foreign country" are new. They were not in the former section of the Patent Act. Except possibly for the express declaration that the provision applies to a patent or publication either in this or in a foreign country, these words do not introduce new law. Subject to this exception, they are to be found in Section 25 of the Act respecting Patents for inventions, being Chapter 34 of Consolidated Statutes of Canada, 22 Vict. 1859, and, no doubt, in earlier legislation. They embody a well known principle of patent law.

So far as it may be sought to apply that principle in this case, the matter may be disposed of at once.

Rice applied for a patent in the United States on December 21st, 1922. That application, the trial judge found, "covered the same subject-matter" as his Canadian application. We agree with this finding and, on the record before us, we entertain no doubt that the case was fought, at the trial, on the understanding that Rice's United States application was substantially the same as his Canadian application. Now Section 8 (2) of the Act reads in part as follows:—

> "An application for patent for an invention filed in Canada by " any person who has previously regularly filed an application for a " patent for the same invention in a foreign country which by " treaty, convention or law affords similar privilege to citizens of " Canada, shall have the same force and effect as the same appli- " cation would have if filed in Canada on the date on which the " application for patent for the same invention was first filed in " such foreign country, provided the application in this country is " filed within twelve months from the earliest date on which any " such foreign application was filed, or from the thirteenth day of " June One thousand nine hundred and twenty-three."

The United States is one of the foreign countries affording "similar " privilege to citizens of Canada." Rice, having previously applied for a Patent in the United States, filed his application in Canada "within twelve months . . . from the passing of (the Canadian) Act." Accordingly, the

trial judge rightly decided that " Rice's filing date in the United States is " his Convention filing date in Canada."

That fixes the date of Rice's application for all relevant purposes as of the 21st December, 1922. It is not claimed that, before that date, the process was patented anywhere. There was no printed publication " in this or any foreign country " describing Rice's invention prior to the 21st of December, 1922.

Bayer filed his application in Denmark on the 11th of September, 1922. But a pending application in Canada is not open to the inspection of the public (Section 52 of the Patent Act). Information in relation thereto may be furnished only to the applicants or persons authorised by them (Rule 19). It does not therefore properly come under the designation of a " printed publication." It must, in the absence of evidence to the contrary, be presumed that the secrecy of application in Denmark is likewise safeguarded.

Moreover, the use in Section 7 of the word " patented " in the same sentence : " Patented or described in any printed publication " determines the matter in our opinion, since it would have been quite unnecessary to enact that no person may in Canada obtain a patent for an invention already " patented . . . in this or any foreign country," if a mere application for a patent was to be taken as a " *printed publication* " within the meaning of the Statute, sufficient to preclude the grant of a Canadian patent for the thing therein described. (*Queen* v. *Laforce*, 4 Can. Exch. Court Rep. p. 14, at p. 38.)

The filing in Canada of an application for a patent will, subject to the conditions prescribed in the Act, prevent a subsequent applicant from obtaining a patent for a similar invention. The filing of a previous application in a foreign country may have the same effect. In neither case, however, will it be because the application is viewed as an antecedent publication, but for other considerations presently to be discussed.

Section 7 requires that the process be " not known or used by others " before (the) invention thereof." It may be at least questionable whether these words are qualified by the other words " in this or any foreign country," now inserted in the enactment after the sentence : " and not patented or " described in any printed publication," but whether they are or are not would seem to be immaterial ; in view of the decision of this Court in *Wright & Corson* v. *Brake Service Limited* (1926, S.C.R., 434) that the words " which " was not known or used by any other person before his (the applicant's) invention thereof," are not qualified by the words " in Canada," from which, " as a mere question of construction of the statute," the Judicial Committee of the Privy Council in *Canadian General Electric Company Limited* v. *Fada Radio Limited* (1930, A.C., p. 97) was " not prepared to differ."

Prior knowledge or use in a foreign country is therefore sufficient. But, in the Wright & Corson case, Cady, who produced the anticipating machine, had been using it openly in his public garage in Canastota, in the State of New York. That was, at least, a user in a public way ; and the question whether antecedent knowledge or user not public was also contemplated by the section did not come up for decision. It has now become

In the Supreme Court.

No. 28. Reasons for Judgment, Rinfret, J. (concurred in by Anglin, C.J.C., and Duff, Newcombe and Lamont, JJ.), 9th May 1930—*continued.*

necessary that we should discuss that question; and we agree with the learned trial judge as to its importance and its difficulty.

In *Queen* v. *Laforce* (4 Ex. C.R. 14), Burbidge J. delivered an elaborate and considered judgment, in the course of which he said that the words " not known or used by any other person " in their true meaning have reference not to " a secret use or the knowledge of an earlier inventor or of " those to whom in confidence he may have disclosed it, but to such a " publication or use as affords the public the means of information or " knowledge of the invention." His conclusion was that " under the patent " law of Canada, a prior foreign invention, of which the public had no " knowledge or means of knowledge is not sufficient to defeat a patent " issued to an independent Canadian inventor."

In *Gerrard Wire Tying Machines Company Limited of Canada* v. *Cary Manufacturing Company* (1926, Ex., C.R., p. 170), the present President of the Exchequer Court expressed the same view :—

" I cannot accept Mr. Anglin's proposition, as expressing the law, " even with the evidence of the alleged inventor as to the conception " being accepted as proven, nor can I agree that a ' physical embodi- " ment ' of the conception, which was never disclosed would void " the patent of a subsequent inventor who had first and effectively " disclosed his invention. It must be conceded I think, without " qualification, that a mere conception of anything claimed to be " an invention, that is concealed and never disclosed or published, " is not an invention that would invalidate a patent granted to a " subsequent inventor. To say that mere conception is invention " or that a first inventor in the popular sense who has not com- " municated or published his invention is entitled to priority over a " later invention accompanied by publication, and for which a " patent was granted, or applied for, would I think throw this branch " of our jurisprudence into such utter confusion as to render the law " of little practical value owing to uncertainty. If this is the policy " and meaning of the Patent Act, an inventor might safely withhold " from the public his invention for years, while another independent " but subsequent inventor of the same thing, who had secured or " applied for a patent, and who had proceeded to manufacture and " sell his invention without any knowledge of the undisclosed " invention would always be in danger if the prior inventor could " secure a patent by merely proving an unpublished invention. " The situation should not I think be changed by the production of " drawings, plans, etc., evidencing the date of the prior invention, or " even a physical embodiment of the invention by the alleged " inventor. All this might be done and still be within the know- " ledge of the inventor alone, it having been kept a secret, and which " so far as the public is concerned is no more effective publication " than a mere conception uncommunicated to the public. There " must be a publication or a use in public of a satisfactory kind in

" order to bar the claim of a subsequent inventor who discloses the " same and first applies for a patent."

And again (p. 185) :—

" Invention without publication, in my opinion, is of no effect, " as against another inventor who discloses the invention and who " applied for a patent. Whether this rule rests upon the principle " of estoppel or laches, or for want of consideration for the monopoly " inherent in a patent, or whether it is a rule of evidence which " presumes against invention in law when undisclosed, it seems to me " to matter little. It is a safe rule to follow. It imposes no hard- " ship or injustice upon any person, it appears well within the letter " and spirit of the statute and seems to have the support of weighty " authority. It is a bar to the fabrication of evidence and other " objectionable practices, and will render assurance to many whose " position ought to be secure."

We have quoted rather extensively from this judgment, because it puts forward with great force the reasons in favour of construing the relevant words of Section 7 as meaning " not known or used " by the public.

The words " by the public," however, are not in the section, and one must accept with caution an interpretation requiring the addition of other words to the language the legislator has seen fit to adopt.

It is not without significance that, in the same section, the words " public use " are to be found in a different connection. If a similar use was meant with regard to the time preceding the invention, it is likely that it would have been expressed in a similar way. In fact, there is a qualification in the language of the section, which rather repels the idea of the necessity for public knowledge or user. " Not known or used *by others* " is clearly a more limited expression than " not known or used by the public." The prior use or knowledge need not be widespread; if it be knowledge or use by more than one person besides the inventor and not confidential, it is sufficient and the language of the enactment is satisfied.

What appears to us a conclusive argument is that, with such a construction, we adhere to the grammatical and ordinary sense of the words (see Lord Macnaghten in *Vacher & Sons* v. *London Society of Compositors*, 1913 A.C., 107). This well known rule in construing statutes, leading, as it does in this case, to no absurdity, repugnancy or inconsistency, should, in our opinion, prevail over an inference based on the assumed intention of Parliament to reward the discoverer who offers his invention to the public, or on the danger of opening the door to perjury and the fabrication of evidence. The reward of the inventor is a matter of policy for Parliament, and, after all, in the present case, the question is not one of Bayer's rights, but whether Rice is entitled to a monopoly as against the public. As was said by Lord Haldane in *British Thomson-Houston Company Limited* v. *Corona Lamp Works Limited* (39, R.P.C., 49, at p. 67) :—

" If inventors have to be protected, so have the public. Every " patent, if valid, restricts the liberty of other inventors, and confers

In the Supreme Court.

No. 28. Reasons for Judgment, Rinfret, J. (concurred in by Anglin, C.J.C., and Duff, Newcombe and Lamont, JJ.), 9th May 1930—*continued.*

" a monopoly . . . The stimulus to development due to the pro-
" tection of the Patent Acts may prove to be less of an advantage
" to the State than would have been the stimulus to free production
" in the interest of the consumer. But with the question of policy
" your Lordships sitting as Judges have no concern. That question
" is for Parliament. We as Judges have only to interpret the law as
" Parliament has enacted it."

As for the incentive to perjury and the fabrication of evidence likely to result if proof of private knowledge is to be accepted, that is of course a serious danger; but it is of a character which the Courts are not unaccustomed to dealing with.

Since the judgments in *Queen* v. *Laforce* and in *Gerrard* v. *Cary*, a change has occurred in the phraseology of the section we are now discussing. It was then " not known or used by *any other* person," and, of necessity, the knowledge might, therefore, have been confined to one person. It now is: " not known or used by others " and would appear to require that the knowledge be held by at least two persons other than the inventor. But whether it was or was not meant, by this substitution of words, to alter the law, it is needless to say that such prior knowledge must be demonstrated. Evidence of this character should be subjected to the closest scrutiny. Anyone claiming anticipation on that basis assumes a weighty burden which cannot be satisfied by mere proof of conception—if, indeed, it can be said that conception alone constitutes an anticipating invention.

Fortunately two recent decisions of the Privy Council afford us guides in this respect.

The first was rendered in *The Permutit Company* v. *Borrowman* (43, R.P.C., 356). It will be remembered that, in that case, one Spencer, in 1917, filed an application in the Canadian Patent Office for a patent for the use of greensand or glauconite for the purpose of softening water. In 1919, Borrowman filed a similar application. The Commissioner declared a conflict between the application and the assignees of Spencer commenced an action in the Exchequer Court claiming a declaration that Spencer, and not Borrowman, was the inventor. Borrowman counterclaimed for a declaration to the same effect in his favour.

The Lord Chancellor (Viscount Cave) delivered the judgment of the Board. We reproduce the following passage (p. 359), stating the facts and the conclusion of the Judicial Committee:—

" As to the Respondent Borrowman, there is no question as to
" the date on which he made the invention. It is undisputed that
" in the month of November, 1913, he conceived the idea, that he
" then made some experiments for the purpose of testing it, that he
" actually made a few filters in which greensand was used for the
" purpose of softening water and sold one of these filters to a friend.
" In the year 1914 he made an application in the United States of
" America for a patent, but on that occasion without success.
" In June, 1916, having further developed his process, he made

" another application for a patent in the United States of America, " which ultimately succeeded; and it is admitted that in the month " of August, 1916, he put the invention fully upon the market.

" Those being the facts as regards the Respondent, the question " is whether Mr. Spencer, the predecessor of the Appellants, has " been proved to have made the same invention, in the true sense of " the word ' invention,' before that date. Mr. Spencer gave evidence " in this case, and he said that he had the idea, or (as in one passage " in his evidence he calls it) the vision, of this process in or just " before the month of May, 1912, and he referred to certain letters " and other documents which he says indirectly corroborate his " statement. This evidence is not strong, and is open to consider- " able comment; but it is needless to examine it in detail, because " it appears to their Lordships that, assuming it to be true, it is not " proved that there was an invention by Mr. Spencer within the " true meaning of the statute. Mr. Spencer did not test his idea; " he made no experiments for that purpose; he did no work for that " purpose. It is said that he communicated the idea through his " agent to a Dr. Duggan, who was then connected with the Permutit " Company, and that Dr. Duggan tested it and came to some con- " clusion about it; but it is plain that what Dr. Duggan did he did " for his own purposes, and not as the agent of Mr. Spencer. Mr. " Spencer in his evidence makes that clear, for he says that he took a " portion of greensand and carried it to his agent's office for the " purpose of having it forwarded to parties in New York with the " idea that they would do the necessary work and report to him, " but that those parties were unknown to him, that he heard nothing " from them, and they made no report to him; and apparently he " did nothing whatever further until late in the year 1916, that is to " say, at a date after Mr. Borrowman's invention was fully made " and completed.

" These being the facts, it appears to their Lordships that it is not " proved that any invention in the true sense of the word was made " by Mr. Spencer in 1912. It is not enough for a man to say that an " idea floated through his brain; he must at least have reduced it to " a definite and practical shape before he can be said to have invented " a process. Still less could it be said that the invention as described " in the Appellants' application for a Patent was made in that year " 1912. If so, that is enough to dispose of this appeal."

We have it, therefore, that, for the purpose of Section 7, " it is not " enough for a man to say that an idea floated through his brain; he must " at least have reduced it to a definite and practical shape before he can be " said to have invented a process."

The second decision of the Privy Council to which we wish to refer is that in *The Canadian General Electric Company Limited* v. *Fada Radio Limited* (1930, A.C., 97). This was also (*inter alia*) a case of priority as between two inventors.

In the Supreme Court.

No. 28. Reasons for Judgment, Rinfret, J. (concurred in by Anglin, C.J.C., and Duff, Newcombe and Lamont, JJ.), 9th May 1930—*continued.*

The application was made by the inventor, Alexanderson, on the 17th of September, 1920, and the patent was granted to his assignees, the Canadian General Electric Company on the 15th of February, 1921. Among the grounds of defence raised by Fada Radio Limited, was anticipation by the specification of a German patent granted, on the 23rd of June, 1919, to Schloemilch and Von Bronk, on an application made on the 9th of February, 1913, which, however, remained unpublished until the grant of the patent.

Their Lordships came to the conclusion that, upon the true construction of the respective specifications, the ground of anticipation by the German patent was not established and the attack upon Alexandersons' patent failed. But they also discussed the point now under consideration. After having referred to the particular words in Section 7 and to the decision of this Court in *Wright* v. *Brake Service* (1926, S.C.R., 434), Lord Warrington of Clyffe, speaking for the Board said :—

> " It undoubtedly overturns patent law as understood in England, " for it is quite certain that in English law, if A. applied for and " took out a patent it would be neither here nor there for B. to " come forward and say : ' I will show that I had already made the " ' discovery, but I kept it to myself.' A. had made a contribution " to the public by showing them how to practice the invention. " B. had made no such contribution, and therefore he had no rights " in the matter. Also it obviously opens the door to defeat any " invention, it may be after a long space of time when it has shown " itself to be really valuable, by parol evidence which may be hard " to check. Nevertheless, as a mere question of construction of the " section, their Lordships are not prepared to differ from the Supreme " Court on this point."

Having thus pointed out what he calls " the danger of the matter," His Lordship proceeds to state the facts and, again we deem it advisable to quote *in extenso*, because the passage is illuminating and places the conclusion in full light :

> " Alexanderson had been enjoying the profits of his patent for " many years, yet now it may be set aside not by Schloemilch and " Von Bronk's specification but by what from the parol testimony " may be held to be their knowledge. It must be clearly kept in " view that the date of the knowledge or use by any other person is a " date before the *invention*, not before the patent. This therefore " lets in parol evidence to uphold, just as it had let it in to cut down " Now, taking the knowledge of Schloemilch and Von Bronk, as the " Supreme Court has done, as at least ten or fourteen days prior " to February 9, 1913, the date of the application for the German " patent, how stands it here as to Alexanderson's invention? On " February 4, Alexanderson wrote a letter to Davis in which he " describes ' the new system of tuning which I have devised,' and " he clearly sets out his method of tuning, as he expresses it, by

" geometrical progression. A copy of that letter was sent to Dr. " Langmuir, who had conversations with Alexanderson in January, " and this is what he says about it, and the conversations he had. " ' *Q.* I would ask you to state whether or not, as one skilled in the " ' art, at that time, the letter formed a disclosure to you of the " ' subject-matter of the Alexanderson patent later in suit in this " ' action?—*A.* This letter covers practically the same ground as " ' the conversations that I had had with Mr. Alexanderson during " ' the preceding weeks. It gives a very clear summary of Mr. " ' Alexanderson's ideas and describes the principles involved in the " ' idea of tuning in geometrical progression, so clearly that it " ' would have been sufficient even if I had not had any previous " ' conversation with Mr. Alexanderson, to have enabled me to build " ' the device and obtain the advantages of geometrical tuning " ' which Mr. Alexanderson foresaw. Not only the theory of the " ' operation of this system described in this letter, but the means " ' of accomplishing it by use of the audion is clearly described.' " The respondent's expert witness, Mr. Hazeltine, is asked as to this " letter, and he criticises the use of the word ' rectify ' used in it, " but in cross-examination he admits that the writer is really refer- " ring not to a rectifier but to a type of audion which DeForest " invented and which he expected Langmuir to improve.

" The question really comes to this, and it is the root of the " matter. The letter taken owing to Langmuir's evidence as being " a mere reproduction of the conversation in January, shows the " whole method, but indicates that one of the necessary parts of the " contrivance must be of a certain quality. That is indicated by this " sentence: ' The device necessary to accomplish this is some form " ' of high frequency relay which enables one high frequency current " ' to control another high frequency circuit without the first circuit " ' being influenced by the phenomena in the second circuit. Such " ' a relay is the incandescent rectifier where the flow of current in " ' the local circuit is controlled by a potential introduced in the " ' path of the radiating energy.' The well known relay was that of " DeForest. It was suspected, though not actually proved, that " it might prove too sluggish for a high frequency relay, but Lang- " muir improved on the DeForest relay and that was the relay " that was included in the specification for the patent. Now, the " Supreme Court has held that Alexanderson's invention was not " completed till May, when, to quote their words, Dr. Langmuir " had constructed audions which when tested were found to give a " frequency in the relayed current equal to the incoming oscillations. " The point is a narrow one, but their Lordships think that what is " meant in the section by using the word ' invention ' instead of " ' application ' or ' patent ' is that what is to be considered is the " description whether spoken to or put in writing which really " gives the means of making the desired thing which is to be the

In the Supreme Court.

No. 28. Reasons for Judgment, Rinfret, J. (concurred in by Anglin, C.J.C., and Duff, Newcombe and Lamont, JJ.), 9th May 1930—*continued.*

" subject of the patent. In other words, the arrangement as to the " audion was complete. The invention was a tuning by geometrical " progression associated with a suitable audion which the modification " of the DeForest audion proved to be. DeForest's audion might " do. If it did not, then a modification of it would. It is just " analagous to saying that a certain part of a machine should be of " a strength capable to bear such-and-such a strain without an " indication of what the exact strength should be. Their Lordships " are therefore of opinion that, fairly read, the evidence shows that " Alexanderson had discovered his ' invention ' in January, 1913, " and therefore he is not hit by the fact which is assumed that " Schloemilch and Von Bronk also discovered it in February, " 1913, though they did not proceed to make practical use of that " discovery."

The holding here, therefore, is that by the date of discovery of the invention is meant the date at which the inventor can prove he has first formulated, either in writing or verbally, a description which affords the means of making that which is invented. There is no necessity of a disclosure to the public. If the inventor wishes to get a patent, he will have to give the consideration to the public, but, if he does not and if he makes no application for the patent, while he will run the risk of enjoying no monopoly, he will none the less, if he has communicated his invention to " others," be the first and true inventor in the eyes of the Canadian patent law as it now stands, so as to prevent any other person from securing a Canadian patent for the same invention.

Coming now to apply these guiding principles to the facts of this case, we find that the commission evidence taken in Denmark establishes that in 1921—almost a year before the earliest date to which Rice's invention can be carried back—Bayer conceived the idea, disclosed it to " others " (Maule, Jacobsen, Philipsen, Schnadorph), instructed experiments, made some on his own account and produced porous cement. Therefore, he had invented the process.

The learned trial judge disregarded that evidence because it did not indicate a disclosure to the public. As we have seen, it is now determined by authority that disclosure to the public is not necessary, under our law, to establish invention in the true sense of the word. On the other hand, the learned judge envisaged Bayer's invention from the starting point only of the Danish application and, as he considered that the specification therein was insufficient, he decided that Bayer had failed to establish priority over Rice. But he arrived at that opinion by applying to the Danish specification the rules governing specifications in Section 14 of the Canadian statute. We do not think Bayer's application should have been judged by that standard for the purposes of this case.

In the passage quoted above from the judgment in Canadian General Electric and Fada Radio, Lord Warrington said :

" Their Lordships think that what is meant in the section by " using the word ' invention ' instead of ' application ' or ' patent '

No. 28.
Reasons for Judgment, Rinfret, J. (concurred in by Anglin, C.J.C., and Duff, Newcombe and Lamont, JJ.), 9th May 1930—*continued.*

" is that what is to be considered is the description whether spoken " to or put in writing which really gives the means of making the " desired thing which is to be the subject of the patent."

Bayer invented a new principle and a practical means of applying it. He " was not bound to describe every method by which his invention could " be carried into effect." (Terrell on Patents, 7th ed. at p. 144). The conception of the idea " coupled with the way of carrying it out " (*Hickton's Patent Syndicate* v. *Patents etc. Limited*, 26 R.P.C. 339 at p. 347) and " reduced to a definite and practical shape " (*Permutit* v. *Borrowman*) constituted the invention of his process, which he communicated to others.

The question of the validity of the Danish patent was not in issue—far less that of the compliance of that foreign patent with the statutory requirements of the Canadian law. The only question in issue was whether the prior knowledge of the invention by Bayer, communicated, as established by the evidence, anticipated Rice. The learned trial judge found that " Bayer preceded Rice in his conception of his alleged invention and in " his experimental work developing the same "; but thought that he had not yet made a " workable invention," when Rice filed his United States Application.

His opinion appears to have been formed largely—if not altogether—upon the fact that, at that time, experiments were still being made in the laboratory of Mr. Jacobsen, in Copenhagen. But those experiments were not for the purpose of discovering a method of carrying out the process; they were endeavours to make the foam " better and better."

Bayer had completed his invention when he added a foam made of frothy substance to the paste of cement and got a porous cement product. In the words of Mr. Philipsen: " You may always try to make a thing " better in working with it and there are innumerable ways of mixing " cement, foam and water together." But Bayer had already found and adopted at least one method of mixing them effectively so as to carry out his idea. He tells us that, about New Year 1921, he conceived it by seeing his wife make a sponge cake, " by seeing her mix the whipped white of " eggs into the dough." He immediately went to his laboratory and, his shaving soap being the most frothy substance he had at hand, he used it to mix up with the cement paste, and it turned out that it immediately gave an excellent result. Later on he experimented with many different substances: ordinary soap, several kinds of mucilage, gelatine and gelatine mixed with formaldehyde. He produced samples and showed them to an engineer, Mr. Fox Maule, in the first days of September 1921. He applied to Professor Jacobsen, at the Royal Technical High School, with similar samples. Mr. Jacobsen was interested and asked his assistant, Professor Philipsen, " to help them with the work of that invention." The latter made experiments as a result of Bayer instructing him and showing him how to do them; and asked:

" *Q.* What was the product? "

He answers:

" *A.* It was what we now call cell concrete."

In the Supreme Court.

No. 28. Reasons for Judgment, Rinfret, J. (concurred in by Anglin, C.J.C., and Duff, Newcombe and Lamont, JJ.), 9th May 1930—*continued.*

Bayer sold his invention, in the spring of 1913, to Christiani and Neilson, who have since manufactured it with much commercial success.

It seems reasonably clear on the evidence that, so far as concerns the invention, the precise manner in which the foam would be produced was a matter of no consequence. This was decidedly Rice's own view, as appears from his specification, where he said:

> " I have indicated above a number of substances and methods " for producing the foam or froth which is to be added to the mortar, " but I wish it to be distinctly understood that my invention, in its " broad aspects, is not limited thereto, inasmuch as any foam, no " matter how made and no matter of what it may consist, falls " within the scope of my invention."

It was common knowledge at the time that a stable foam could be made from a great many well known mucilaginous substances. The experts agree that " it is a very simple process," requiring no scientific training, and that any ordinary workman would be able to work. On that point, reference may be made to two short extracts of the evidence. Mr. A. E, MacRae, one of appellants' witnesses deposed:

> " Mr. HERRIDGE: Now, Mr. MacRae, in those experiments which " you have referred to, and which you say were based on this Bayer " disclosure, were you in any difficulty in carrying them out because " of the suggested scarcity of bubble in the Bayer disclosure?— " *A.* None whatever.
>
> " *Q.* And why do you say that the Bayer disclosure contains " adequate instructions to enable these experiments to be done.
>
> " Mr. BIGGAR: He has not said that.
>
> " HIS LORDSHIP: He has said so inasmuch as he did it himself.
>
> " WITNESS: The disclosure clearly discloses enough to enable " anyone to carry out the process there described.
>
> " HIS LORDSHIP: I understand you, Mr. MacRae, to say that " everything about this is simple?—*A.* Extremely simple."

Mr. RICE the rival inventor himself said:

> " Mr. HERRIDGE: Well, it is a thing (the process) that could be " carried out by any practical minded person if the general idea is " disclosed?
>
> " Mr. RICE: One would think so."

Paraphrasing the words of Lord Warrington in the Fada Radio case: When Bayer went to Professor Jacobsen, the invention was complete. The process was the addition to the paste of cement of a stable foam, which the foam adopted by Bayer " proved to be." Bayer's foam " might do." It may be that other foam producing agents would equally do; but Bayer's foam was sufficiently effective to produce the porous cement.

We are, therefore, of opinion that Bayer had " discovered " his invention in September 1921 or more than a year prior to the earliest date to which Rice can carry his invention back. He had then made it impossible for Rice to claim the invention at a later date (*Alexander Milburn*

Company v. *Davis Bournonville Company*—270 U.S. Rep. 390 at pp. 400-401) and accordingly to secure a valid grant for it under The Patent Act.

There remains one point to be disposed of. On behalf of the respondent, it was contended that the use of glue is a distinctive mark of the Rice patent. While Bayer, it was argued, suggests only mucilage as a foam developing substance. Rice suggests glue in a certain specified form and has embodied the suggestion in certain specified claims, to wit: claims 13 and 18 of his patent. It is said that those are specific suggestions in respect of which he is entitled to his patent *pro tanto* and the court is urged to render a judgment in accordance with those facts under Section 31 of the Patent Act.

Assuming that, under the circumstances, the evidence justifies a distinction between mucilage and glue, and without deciding whether Section 31 would, in a proper case, permit the court to discriminate in the way indicated, we do not think such relief can be granted in this case.

Under Rule 14 of the Rules and Regulations of the Patent Office of Canada, made pursuant to Section 59 of the Act and effective the 1st of September 1923, " two or more separate inventions cannot be claimed in " one application, nor included in one Patent." The invention named and described in Rice's patent, in accordance with the imperative requirements of Sections 13 and 14 of the Act, was declared as having for " its particular object " the providing of a " cellular composition or product adapted to be " used for walls, constructional purposes, fireproofing of the frame work " of steel buildings and practically all purposes that concrete can be used " for." The patent that Rice got is for the principle of producing a cellular or porous cement product by mixing a tenacious stable foam with a cementitious material. The patent is not for an invention consisting in a particular new method of applying the principle. In other words: it was not applied for, nor was it granted for the subordinate discovery of certain foam producing agents or mixtures such as may be specifically defined in claims 13 and 18. Rice did not claim that as a separate invention. His patent may not now be transformed into and restricted to a patent for that kind of invention.

Our conclusion is that the judgment appealed from should be reversed and that Letters Patent Number 252546 should be declared invalid and adjudged cancelled, with costs here and in the Exchequer Court.

We think however we should not part with this case without taking yet another step. The Patent Act was enacted for the public and the grant of a patent is a matter of public concern. For that reason, attention should be drawn to the following facts: It was demonstrated in this case, that the invention made by Bayer formed the subject-matter of a patent issued to him in the Kingdom of Denmark on the 19th of June, 1923, and there published on the 2nd of July, 1923, upon an application filed on the 11th September, 1922. When application for the same invention was filed in the Canadian Patent Office on the 6th of December, 1924, the oath accompanying the petition to the Commissioner of Patents (taken by one who cannot escape the imputation of full knowledge of the matter) was to

In the Supreme Court.

No. 28. Reasons for Judgment, Rinfret, J. (concurred in by Anglin, C.J.C., and Duff, Newcombe and Lamont, JJ.), 9th May 1930—*continued.*

the effect that no application for a patent for " the said improvements had " been filed in any foreign country except as follows: Germany, German " Patent Application No. 111020, filed on September 8th, 1923." No mention was made of the Danish application or patent, and a material allegation in the declaration of the applicant was, therefore, apparently untrue. Possibly, this circumstance is susceptible of satisfactory explanation and we do not wish to be understood as casting any reflection on anybody since the facts have not been fully investigated and ascertained. But we deem it our duty to direct that notice of this apparent omission should be sent by the Registrar to the Commissioner of Patents and to the Minister of the Crown entrusted with the administration of the Patent Act, so that they may be informed of this situation and enabled to act upon it as they may deem advisable.

In the Privy Council.

No. 29. Order in Council granting special leave to appeal to His Majesty in Council, 27th October 1930.

No. 29.

Order in Council granting special leave to appeal to His Majesty in Council.

AT THE COURT AT BUCKINGHAM PALACE

The 27th day of October, 1930.

Present

THE KING'S MOST EXCELLENT MAJESTY

* * * *

Whereas there was this day read at the Board a Report from the Judicial Committee of the Privy Council dated the 28th day of July 1930 in the words following viz. :—

" Whereas by virtue of His late Majesty King Edward the Seventh's Order in Council of the 18th day of October 1909 there was referred unto this Committee a humble Petition of John A. Rice in the matter of an appeal from the Supreme Court of Canada between the petitioner Appellant and Frits Ricdolf Christiani and Aaze Nielsen, trading under the name firm and style of Christiani & Nielsen and the said Christiani & Nielsen Respondents setting forth (amongst other matters) that the Petitioner desires to obtain special leave to appeal from the Judgment of the Supreme Court dated the 9th May 1930 allowing an Appeal from the Judgment of the Exchequer Court of Canada in an Action to impeach a patent (No. 252,546) granted to the Petitioner on the 11th August 1925 for a new building material and the process of making it and declaring the patent to be invalid: that the material described is a cellular concrete prepared by stirring

No. 29.
Order in Council granting special leave to appeal to His Majesty in Council, 27th October 1930—*continued.*

the bubbles of a tenacious foam with the watery cementitious material so as to obtain a concrete full of cavities resulting from the presence of the bubbles: that the invention upon which the Petitioner's patent was founded was made by him in the United States in November and December 1922: that he applied for a United States patent on it on the 11th December 1922 this being the Convention date from which he is entitled to priority in Canada: that his Canadian patent now in question was impeached by the Plaintiffs Respondents on the ground that one Bayer had earlier made the same invention in Denmark and Bayer's oral evidence in support of this allegation was supported by proof of a Danish application for patent made by him on the 11th September 1922 but upon which no patent issued and which accordingly remained unpublished until the 19th June 1923 some time after the Petitioner's invention was in commercial use: that the Judgment at the trial proceeded on the ground that although it appeared that Bayer had conceived the idea of the invention earlier than the Petitioner the Plaintiffs had failed to establish that Bayer had been the earlier to complete the invention in a legal sense: that with this finding the Supreme Court disagreed and its Judgment is chiefly concerned with a further and most important question with which the learned trial Judge had not found it necessary to deal namely the question whether in order to set aside an otherwise valid patent it is sufficient to show that prior to the date of the invention upon which it is based the same invention had been privately known or used by others: that the Court held that it was unnecessary to prove any prior public knowledge or public use and accordingly declared the Petitioner's patent invalid: And humbly praying Your Majesty in Council to order that the Petitioner shall have special leave to appeal from the Judgment of the Supreme Court of the 9th May 1930 or for such further or other Order as to Your Majesty in Council may appear fit:

"The Lords of the Committee in obedience to His late Majesty's said Order in Council have taken the humble Petition into consideration and having heard Counsel in support thereof Their Lordships do this day agree humbly to report to Your Majesty as their opinion that leave ought to be granted to the Petitioner to enter and prosecute his Appeal against the Judgment of the Supreme Court of Canada dated the 9th day of May 1930 upon depositing in the Registry of the Privy Council the sum of £400 as security for costs:

"And Their Lordships do further report to Your Majesty that the authenticated copy under seal of the Record produced by the Petitioner upon the hearing of the Petition ought to be accepted (subject to any objection that may be taken thereto by the Respondents) as the Record proper to be laid before Your Majesty on the hearing of the Appeal."

In the Privy Council.

No. 29. Order in Council granting special leave to appeal to His Majesty in Council, 27th October 1930—*continued.*

HIS MAJESTY having taken the said Report into consideration was pleased by and with the advice of His Privy Council to approve thereof and to order as it is hereby ordered that the same be punctually observed obeyed and carried into execution.

Whereof the Governor-General or Officer administering the Government of the Dominion of Canada for the time being and all other persons whom it may concern are to take notice and govern themselves accordingly.

M. P. A. Hankey.

EXHIBITS.

2. (Evidence on Commission.) Translation of letter from C. Fox Maule to Bayer, 21st September 1921.

2. (Evidence on Commission.) Translation of letter from C. Fox Maule to Bayer.

A. HERMANSEN, CIVIL ENGINEER,
Recuperative Gas Furnaces
For Any Industry.

Thermo-technical Laboratory
Inglestad, Sweden
Cable Address : Hermansen
Vaxjo
Trunk Call : Inglestad 33.
21st September 1921.

Office for Sweden :
12, Storgatan, Vaxjo.
Office for Norway :
22, Raadhusgaten, Christiania.
Office for Denmark :
4, Vestreboulevard, Copenhagen.
Office for Finland :
8, L. Robertg, Helsingfors.
Office for U.S.A. :
145, W. 45th Str., New York.
Office for France :
31, rue Vivienne, Paris.
Office for Russia :
111, Newsky Pr., Petrograd.
Office for England :
66½, Corporation St., Birmingham.
Office for Spain :
5, Bidebarrieta, Bilbao.
Office for Italy :
Milano.

MR. BAYER, Civil Engineer.

Dear Sir,

Last week Mr. Hermansen, Civil Engineer, had an interview with Prof. Kreuger concerning your foam substance; however, Prof. Kreuger is not interested in same, but he is constantly hot upon the plastic clay.

Prof. Kreuger is of opinion that the product is so brittle that it will not become of importance and asserts that other similar methods are existing (with air-developing inorganic substances), which have not become of importance on account of the fragility of the product, though the manufacture was very cheap.

Exhibits.

2. (Evidence on Commission.) Translation of letter from C. Fox Maule to Bayer, 21st September 1921 —*continued.*

Unfortunately it did not succeed in obtaining any definite statement from Mr. Hermansen, whether he hereafter renounces his preemption, and at present he is in Paris. If the decision requires quick despatch, I suggest you apply to Mr. Winther and ask him, what time-limit it is customary to grant for such declarations; maybe he will assist you in drawing up a direct inquiry, provided this should be necessary.

We are now about filing foreign applications for the cell substance, and you will therefore soon obtain some powers for signature.

With kind regards,

C. FOX MAULE.

Hereby I certify the foregoing to be a correct copy of the letter produced to me, which I have returned provided with my stamp.

Copenhagen, the 13th August, 1928.

(Sgd.) Emmy Kuba,
Sworn Translator and Interpreter.

Hereby I certify the foregoing to be a true and faithful translation of the annexed copy.

Witness under my hand and seal.

Copenhagen, the 14th August, 1928.

(Sgd.) Emmy Kuba,
Sworn Translator and Interpreter.

(STAMPS)

I certify the foregoing signature to be that of E. Kuba, sworn Translator at Copenhagen.

BRITISH CONSULATE,
Copenhagen, 14th August, 1928.

(SEAL)

(Sgd.) John B. Dano,
British Vice-Consul,
Copenhagen.

(BRITISH CONSULATE)
(SEAL)

Exhibits.

4. (Evidence on Commission.) Translation of Philipsen note book entries, dated from 8th December 1921 to 2nd October 1922.

4. (Evidence on Commission.) Translation of Philipsen note book entries dated from 8th December 1921 to 2nd October 1922.

BAYER

Tests with porous " CEMENT STONE " (b)

8th Dec.-21.

For these tests the following mixtures were used :

MARKED 1b. 150 gr foam (Casein) plus
10 gr soluble glass is added gradually to
220 gr cement this

After having stood a short time (1 hour) it turned out that the sample had shrunk so much that it was UNUSABLE.

MARKED 2B 150 gr foam
780 gr cement } first mixed, thereafter the foam was
350 gr water added.

9th Decem.

MARKED 3B

150 gr cement
91 gr foam (casein) } 2 samples.

MARKED 4B.

125 gr cement
91 gr foam (cepein) } 1 sample.

11th Decem.-21.

Tests with porous " MOLER " (silicious clay) c.

MARKED 1.c. (150) 120 gr foam (glue)
(62) 70 gr " Moler "

Was dried at about 50° C.

15th Decem. The brick had shrunk considerably during the drying and an attempt was made to produce a brick with higher clay contents marked 11c.

150 gr foam (glue)
90 gr " Moler "

Was dried at about 50 deg. Centigrade.

Exhibits.

4. (Evidence on Commission.) Translation of Philipsen note book entries, dated from 8th December 1921 to 2nd October 1922—*continued.*

22nd June -22.

Of 3575 gr - - - - burnt " Moler "
(corresponding to $5\frac{3}{4}$ litres ?)
+ 3 litres cement
+ 6 900 gr foam mixed with 6 ? liters water
6 4320
3575
6000
900
14795
9400
5395

2000

1,44
3
432

5 x 32, 5 x 49, 5
8050

50

250 0
250
3

9400(8000)
8000(9400)1.17
8000
14000
8000
60,000

5600
3575
2025

21st March -22. Infusorial Silica + Cement, marked D.

1) 45 gr infusorial silica
45 gr cement
100 gr foam
} sifted to the mixture.

Of 3500 gr " Moler "

1500

I. 1 liter cement 1370 gr 130
900 gr foam 680

2050

3500 cm3 water (scantily)
a little too much
consequently a handful of water is added

0.85

II. 3500 gr " Moler "
2050 gr cem

3125 gr water
900 gr foam

700 0,5 6000 1.12

$\frac{7.5}{4,3} = \frac{0,5 \times 6000}{700}$

75(430),5.7
375
550
525
0

7(300)4,3
28
20

---

6 ko .s 4,31

III. Sand
————illegible

0,75 l.

Cem. 580 gr
290
870

Water 2300 (or———illegible)
(or———600 ?)

150 gr foam

IV. 770 cement
5,4 ko. s sand

876(4620) 5
4380
3400

87/700 water
320 foam

1074
615
459

Exhibits.

4. (Evidence on Commission.) Translation of Philipsen note book entries, dated from 8th December 1921 to 2nd October 1922—*continued.*

16th September '22

V. sand 6 Ko. s 4 liters
cement 1,3 liters
Sp. gr. 1,04 water 1,5 liters
foam 470 gr

VI. sand 4 liters
cement 2 liters
water 1,5 liters
foam 7 509 sp. gr. 1,24
23rd Septem. -22

---

7. sand 4 1
cement 1, 3 1.
water 1,5
(= 5)

---

8. 3500 gr " Moler "
2050 gr cem.
4000 sand
(Parable 11)
23rd Septm. -22
10 — 340 gr cement Fr.
875 gr " Moler "
160 gr foam
2X — 850 gr water
875 450
342
1217
———illegible

23rd Septm. -22

11. 164 gr foam
875 gr " Moler "
342 gr cement
850 gr water
tube

---

12. circular slab

14.

foam : 1 l. water
80 gr.———illegible
10 gr.———illegible

2nd Octb. -22

13. 1 liter ce.
3 liters M.L.
$2\frac{3}{4}$ liters water
550 gr. foam — obs — illegible

---

14. 1,3 liters French Ce
4 liters M.L.
3400 cm — 1137 gr (illegible)

---

15. 1,5 " Moler "
0,5 Cement Danish — Will be thicker with this amount of water than the French one.

1,3) 170 (1300
1,3 125
— 250
40 ——
1675 water

2-9-

16. French cement — 2 liters
" Moler " — 6 liters

11th Oct. -22.

1500 cm 3 " Moler "
1500 — water
500 cement Danish

12th Decm. -21. Tests with porous FIRE-CLAY D.

MARKED 1D. 150 gr foam (glue)
310 gr clay

Dried at about 50 deg. Centigrade.

14th Decm. It turned out that the sample had hardly shrunk during the drying, but nevertheless it was rather porous, though not as much as desirable.

Exhibits.

4. (Evidence on Commission.) Translation of Philipsen note book entries, dated from 8th December 1921 to 2nd October 1922—*continued.*

15th Decm. In order to obtain a more porous brick it was attempted to produce some bricks, which contained less clay than 1 D.

11 D.150 gr foam (glue)
270 gr fire-clay
111 D. 150 gr foam (glue)
(230) 230 gr fire-clay
was dried at about 50 deg. Centigrade.

It turned out that particularly II and III had shrunk considerably, perhaps on account of the disfavourable shape of the mould.

After having made an iron mould, the dimensions of which corresponded to an ordinary brick, the following stones were made :

20th Jan. -22. Iv. D. 150 gr foam (glue)
250 fire-clay

Attention is drawn to the fact that the glue was rotten, when used. It turned out that the bricks shrank too much, and consequently another one of the following contents was produced.

26th Jan. -22. V.D. 150 gr foam (glue)
230 fire-clay

I certify that the foregoing is a correct copy of a memorandum-book produced to me, which I have returned provided with my stamp.
Copenhagen, the 13th August, 1928.

(Sgd.) EMMY KUBA,
Sworn Translator and Interpreter.

Hereby I certify the foregoing to be a true and faithful translation of the annexed copy in the Danish language.

Witness under my hand and seal.
Copenhagen, the 14th August, 1928.

(Sgd.) EMMY KUBA,
Sworn Translator and Interpreter in English.

Hereby I certify the foregoing signature to be that of E. Kuba, Sworn Translator at Copenhagen.

BRITISH CONSULATE,
Copenhagen, 14th August, 1928.

(BRITISH CONSULATE)
(SEAL)
(STAMPS)

(Sgd.) JOHN B. DANO,
British Vice-Consul,
Copenhagen.

Exhibits.

3. (At Trial.) Translation of Danish record file and Danish patent to Bayer (published 2nd July 1923).

3. (At Trial.) Translation of Danish record file and Danish patent to Bayer (published 2nd July 1923).

The annexed copy is in accordance with the application for a patent for a method of manufacturing porous building materials filed by Mr. Erik Christian Bayer, Civil Engineer, Copenhagen, on the 11th. September, 1922, together with the description relating to same and the letters dispatched by the Patent Office on account of this application.

The Patent and Trade-Mark Office,
Copenhagen, the 19th September, 1928
(sign.) N. J. Ehrenreich Hansen.
Director

L.S.

(1) Patent Office Certificate, 19th September 1928.

Copy.....3 Danish Crowns 50 Ore
Annexing.....1 „ „
Certification .....2 Danish Crowns
GJ/CH

APPLICATION.

(2) Application for patent, 11th September 1922.

I, the undersigned Erik Christian Bayer, Civil Engineer, residing No. 110 Norrevoldgade, hereby beg to apply the Patent Office for a patent for a method invented by me for the production of porous building materials.

Copenhagen, the 11th. September, 1922
Erik Christian Bayer

Enclosed please find the description in two copies and 50 Danish Crowns.

Erik Christian Bayer, Civil Engineer,
No. 110, Norrevoldgade

Method of Manufacturing Porous Building Materials.

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,

Exhibits.

3. (At Trial.) Translation of Danish record file and Danish patent to Bayer (published 2nd July 1923).

(2) Application for patent, 11th September 1922 —*continued.*

possibly carbonic acid. In most cases it will, however, be simplest to add foam already developed to the mixing fluid or to the 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 sea-tang, 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.

PATENT CLAIMS.

1. Method of manufacturing porous building materials from substances which are setting when mixed with water or other fluids, characterized by the fact that foamy substances, from which foam is produced before the setting, for instance by the introduction of compressed air, or foam already developed from such substances, are added to the mixing fluid or to a mixture of same and the setting substance.

2. Method as stated in claim 1, characterized by the fact that the foamy substance consists of a mucilage, for instance tangin.

3. Method as stated in claims 1 and 2, characterized by adding gelatine to the foamy substance.

4. Method as stated in claims 1–3, characterized by adding formaldehyde to the foamy substance or to the foam.

Erik Christian Bayer.

---

(3) Letter, Director of Patents to Bayer, 9th November 1922.

Copenhagen, the 9th November, 1922.

With regard to the application filed by you on the 11th September, 1922, for a patent for a method of manufacturing porous building materials, the publication prescribed by Sect. 16 of the Patent Act will take place on the 27th inst.

(Signature)
Director

Mr. E. C. Bayer, Civil Engineer,
No. 110, Norrevoldgade, K.

Exhibits.

3. (At Trial.) Translation of Danish record file and Danish patent to Bayer (published 2nd July 1923).

Copenhagen, the 30th January, 1923.

With reference to the letter of the 9th November, 1922, from this office concerning your application of the 11th September, 1922, for a patent for a method of producing porous building materials, it is officially stated that the said patent will be issued, when the required fee of 35 Danish Crowns has been paid to his office within 3 weeks from this date. If the fee be not paid within the expiration of this term, the application will be considered withdrawn.

Attention is drawn to the fact that the annuity of Danish Crowns 25., which is payable for the first year, for which the patent is granted, will be due for payment before the commencement of said year, counting from the date of the letters patent, and that it consequently is advisable to pay it simultaneously with the above-mentioned fee. If the annuity be not paid before the date of the letters patent, it will be increased by one fifth.

(4) Letter, Director of Patents to Bayer, 30th January 1923.

(Signature)
Director

Mr. E. C. Bayer, Civil Engineer,
No. 110 Norrevoldgade, K.

---

(5) Letter, Director of Patents to Bayer, 10th April 1923.

Copenhagen, the 10th April, 1923.

In view of the fact that editorial amendments have been made in the description belonging to your application filed with the Patent Office on the 11th September, 1922, for a patent for a method of manufacturing porous building materials, a copy of said description and a proof of same are hereby forwarded with the request to provide the latter with an endorsement to the effect, whether you approve the amendments or not.

You are requested to return the enclosures together with your answer.

(Signature)
Director

Mr. E. C. Bayer, Civil Engineer,
No. 110, Norrevoldgade, K.

---

(6) Letter, Director of Patents to Bayer, 28th April 1923.

Copenhagen, the 28th April, 1923.

The description and proof belonging to your application of the 11th September, 1922, for a method of manufacturing porous building materials and forwarded to you by letter of the 10th instant, having not been returned, you are hereby requested to return the vouchers in question with the endorsement asked for within three days, as the Patent Office otherwise shall consider the amendments made in the description approved by you.

(Signature)
Director

Mr. E. C. Bayer, Civil Engineer,
No. 110, Norrevoldgade, K.

Exhibits.

3. (At Trial.) Translation of Danish record file and Danish patent to Bayer (published 2nd July 1923).

(7) Letter, Director of Patents to Bayer, 19th June 1923.

Copenhagen, the 19th June, 1923.

Hereby letters patent No. 31916 issued according to the letter of the Patent Office of January 30th, 1923, for a method of manufacturing porous building materials is forwarded to you.

Simultaneously attention is drawn to the fact that 10 copies of the description of individual patents with drawings are obtainable against payment of Danish Crowns 15 :—provided the order is filed with the Patent Office not later than one week after the date, on which the publication of the issuing of the patent in question has taken place.

(Signature)
Director

Mr. E. C. Bayer, Civil Engineer,
No. 110, Norrevoldgade, K.

Danish Patent

No. 31916.

DESCRIPTION.

Published on the 2nd of July, 1923.

(8) Letters Patent, 19th June 1923.

METHOD OF MANUFACTURING POROUS BUILDING MATERIALS.

(Patent issued on June 19th, 1923, protected from the 11th September, 1922.

(Class : 80—Stone and Cement Industry.)

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 sea-tang, the socalled 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.

PATENT CLAIMS.

1. Method of manufacturing porous building materials from substances, which are setting when mixed with water or other fluids, characterized by the fact that foamy substances, from which foam is produced before the setting, for instance by the introduction of compressed air, or foam already developed from such substances, are added to the mixing fluid or to a mixture of same and the setting substance.

2. Method as stated in Claim 1, characterized by the fact that the foamy substance consists of a mucilage, for instance tangin.

3. Method as stated in Claims 1 and 2, characterized by adding gelatine to the foamy substance.

4. Method as stated in Claims 1-3, characterized by adding formaldehyde to the foamy substance or to the foam.

The above description is in accordance with the description belonging to patent No. 31916.

The Patent and Trade Mark Office
Copenhagen, the 19th September, 1928

(sign.) N. J. Ehrenreich Hansen,
Director.

Printed Copy .....3 Kr.
Certification 2

Hereby I certify the foregoing to be a true and faithful translation of the annexed document in the Danish language.

Witness under my hand and seal
Copenhagen, the 24th September, 1928.

(Sgd.) EMMY KUBA
Sworn Translator & Interpreter in English.

(SEAL)

Exhibits.

A. (At Trial.) Record file, Bayer application for Canadian Letters Patent No. 265,601.

A. (At Trial.) Record file, Bayer application for Canadian Letters Patent No. 265,601. (1) Patent Office Certificate, 26th January 1928.

DOMINION OF CANADA
PATENT OFFICE
CHRISTIANI
v.
RICE
EX. A
C. M. R. E. C.

CERTIFIED TO BE true and correct copy of the original Record File, Exclusive of Specification remaining on record in this office, relating to Patent No. 265,601, bearing date the 9th day of November, 1926, and granted to ERIK CHRISTIAN BAYER, for "PROCESSES OF MANUFACTURING POROUS BUILDING MATERIALS."

AS WITNESS the seal of the Patent Office hereto affixed at the City of Ottawa in the Dominion of Canada this 26th day of January, in the year of our Lord one thousand nine hundred and twenty-eight.

(Sgd.) THOS. L. RICHARD
Acting Commissioner of Patents

Application No. 297,541 Filed Dec. 6, 1924
Class 106
Sub-Class 24
Title PROCESSES OF MANUFACTURING POROUS BUILDING MATERIALS
Index Title POROUS BUILDING MATERIALS
Inventor E. C. BAYER
Referred to Division 9 January 2, 1925,

REPORTS AND AMENDMENTS
ENTERED.....
Claims 1/2/3
Stop Order Publish
REMOVED..... Figure .....
Allowed under Section 19 of the Patent Act
June 10th, 1926.
Thos. L. Richard
Acting Commissioner of Patents
NOTICE OF ALLOWANCE ALLOWED.....192
Dated June 15, 1926

Exhibits.

A. (At Trial.) Record file, Bayer application for Canadian Letters Patent No. 265,601. (2) Bayer's application for Patent, 4th September 1924.

Application for Canadian Patent

Petition with Power of Attorney

To the Commissioner of Patents, Ottawa.

The petition of Erik Christian Bayer, a subject of the King of Denmark, residing at 21 Nordre Frihavnsgade 21, Copenhagen, in the Kingdom of Denmark, showeth :—

That he hath invented new and useful Improvements in

Processes of Manufacturing Porous Building Materials not known or used by others before his invention thereof, and not patented or described in any printed publication in this or any foreign country more than two years prior to this application and not in public use or on sale in this country for more than two years prior to this application.

Your petitioner, therefore, prays that a Patent may be granted to him for the said invention, as set forth in the specification in duplicate relating thereto.

Said petitioner hereby appoints A. E. MacRae, Patent Attorney, Resident Manager of Marks & Clerk, 128 Wellington Street, in the City of Ottawa, Province of Ontario, to represent him and stand in his place and stead for all the purposes of the Patent Act including the service of any proceedings taken thereunder.

Your petitioner also hereby appoints Messrs. Marks & Clerk, of No. 128 Wellington Street, Ottawa, Canada, his attorneys, with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to receive the Patent, and to transact all business in the Patent Office connected therewith.

Signed at Copenhagen this 4 day of September, 1924.

(Sgd.) ERIK CHRISTIAN BAYER.

Witness :
G. Colm.

---

(3) Bayer's Oath, 4th September 1924.

OATH.

Denmark } S.S.
Copenhagen }

I, Erik Christian Bayer, a subject of the King of Denmark, residing at Nordre Frihavnsgade, Copenhagen, Denmark, make oath and say that I verily believe that I am the Inventor of the new and useful improvements in processes of manufacturing porous building materials described and claimed in the specification relating thereto and for which I solicit a patent by my petition, dated September 4, 1924.

Exhibits.

A. (At Trial.) Record file, Bayer application for Canadian Letters Patent No. 265,601.

(3) Bayer's Oath, 4th September 1924 —*continued.*

That no application for a patent for said improvement has been filed by me or others with my knowledge or consent in any foreign country, except as follows :—

Germany. German patent application No. 111,020, filed on September 8, 1923.

And I further say that the several allegations contained in the said petition are respectively true and correct.

(Sgd.) ERIK CHRISTIAN BAYER (3)

Sworn before me, at Copenhagen this fourth day of September, 1927.

(Sgd.) JOH. B. DAVIS (4)

British Vice-Consul.

(Stamp)

(Stamp)

(Official character)

Stamp Stamp

---

(4) Letter, Marks & Clerk to Commissioner of Patents, 3rd December 1924.

MARKS & CLERK.

FOREIGN PATENT & TRADE MARK AGENTS

220 Broadway

New York

December 3, 1924.

Hon. Commissioner of Patents,
Ottawa, Canada.

(Patent Office)
Dec. 6, 1924.
CANADA.

Sir,—

Re : Erik Christian Bayer Canadian Pat. Appln.
(Our Case No. 26738)

We enclose herewith the necessary documents for filing an application for patent in Canada in the name of Erik Christian Bayer, a subject of the King of Denmark, residing at 21 Nordre Frihavnsgade 21, Copenhagen, Denmark, for an Improvement in Processes of manufacturing porous building materials, together with a check for Fifteen Dollars covering the Government filing fee, and we await the filing certificate in due course.

Yours respectfully,
MARKS & CLERK.

TVL
ENCL

P.S.—Please send acknowledgments and all letters hereon to our Ottawa Office, 128 Wellington Street, Ottawa.

Exhibits.

PATENT OFFICE CANADA.

PATENT & COPYRIGHT
Dec. 6, 1924
OFFICE

Received from E. C. Bayer .....
$15.00 No. 45775
Pat.....Fee

J. P. Beaudoin,
Accountant C.

A. (At Trial.) Record file, Bayer application for Canadian Letters Patent No. 265,601 (5) Receipt for Patent fee, 6th December 1924.

PATENT AND COPYRIGHT OFFICE.

Communications should be addressed
" The Commissioner of Patents "
" OTTAWA "
when writing on this subject refer to Serial Number of application.

CANADA PATENT OFFICE
OTTAWA, Dec. 20, 1924.

(6) Letter, Commissioner of Patents to Marks & Clerk, 20th December 1924.

APPLICANT: E. C. BAYER
TITLE OF INVENTION: PROCESSES OF MANUFACTURING POROUS BUILDING MATERIALS.
FILING DATE: Dec. 6th, 1924.
SERIAL NUMBER: 297,541.

Gentlemen :—

You are hereby advised of the filing of the above application for patent.

Your obedient servant,
GEO. F. O'HALLORAN,
Commissioner.

To : Messrs. Marks & Clerk,
128 Wellington Street,
Ottawa, Ont.

ACCEPTED UNDER AUTHORITY OF
JUDGE AUDETTE'S DECISION
COMMISSIONER TO BE ADVISED
BEFORE NOTICE OF ALLOWANCE.

Exhibits.

A. (At Trial.) Record file, Bayer application for Canadian Letters Patent No. 265,601.

(7) Letter, Marks & Clerk to Commissioner of Patents, 30th October 1925.

MARKS & CLERK.

Canadian and Foreign Patents and Trade Marks.

128 Wellington Street,
Ottawa, Canada.

October 30th, 1925.

The Commissioner of Patents,
Ottawa, Ont.

(Patent Office)
Oct. 30, 1925.
(CANADA)

Serial No. 297,541,
E. C. Bayer.

Sir :—

We do not appear to have received any action on this application since the application was filed on December 6th, 1924. Please let us know when action may be expected.

Yours very truly,
MARKS & CLERK.

RRJ.LVM.

---

(8) Letter, Commissioner of Patents to Marks & Clerk, 25th November 1925.

PATENT AND COPYRIGHT OFFICE.

Communications should be addressed
" The Commissioner of Patents "
" OTTAWA " CANADA PATENT OFFICE
when writing on this subject refer to serial number of application.

OTTAWA, Nov. 25, 1925.

Gentlemen,—

Application Serial No. 297,541
Applicant, E. C. Bayer.

I have the honour to acknowledge the receipt of your letter of the 30th ultimo, and in reply to inform you that action in this application is withheld by reason of possible conflict with a co-pending case in respect of which the filing of a divisional application is expected shortly. The Examiner hopes to report in your client's application at an early date.

Your obedient servant,
(Sgd.) GEO. F. O'HALLORAN,
Commissioner.

To : Marks & Clerk,
128 Wellington Street,
Ottawa, Ont.

No. 297,541. February 3, 1926. Exhibits.

Gentlemen,—

Application No. 297541 of Erik C. Bayer, for " Processes of Manufacturing Porous Building Materials " appears to the Commissioner to disclose and claim patent matter that may, unless amended, bring it into conflict with application No. 307,847 of John A. Rice for " Process for Producing a Foamy Body ", filed through Mr. Henry H. Byrne, Washington Loan and Trust Building, Washington, D.C., U.S.A. A copy of the apparently conflicting claims in the latter application is enclosed.

A. (At Trial.) Record file, Bayer application for Canadian Letters Patent No. 265,601. (9) Letter, Commissioner of Patents to Marks & Clerk, 3rd February 1926.

A delay of sixty days from the date hereof is allowed to enable the applicants to avoid the possibility of conflict by amendment.

Failing amendment to the above effect at the expiration of such time, a conflict will be declared and the applicants shall be required by the Commissioner within such time as may be stipulated by him to appoint their arbitrators to determine the conflict in accordance with the provisions of Section 22 of the Patent Act.

Encl.

Your obedient servant,

GEO. F. O'HALLORAN,
Commissioner of Patents.

Messrs. Marks & Clerk,
128 Wellington Street,
Ottawa, Ont.

PATENT OFFICE
Feb. 11, 1926.
CANADA.

(10) Letter, Marks & Clerk to Commissioner of Patents, 11th February 1926.

MARKS & CLERK.
Canadian and Foreign Patents and Trade Marks.
128 Wellington Street,
Ottawa, Canada.

February 11, 1926.

The Commissioner of Patents,
Ottawa, Ont.

Serial No. 297,541.
E. C. Bayer.

Sir,—

We duly received your letter of the 3rd instant and note that you consider there is a possibility of conflict between this application and application No. 307847. Our client and applicant reside in Denmark and it is unlikely that we shall be able to receive their instructions in the short period for responding to your letter, as the greater part of the period, allowed will be required for the letters to reach Denmark, and for our cleint's reply to reach Canada and, therefore, hardly any time will be left to enable the applicant to give proper consideration to the matter set forth in your letter.

We should therefore be obliged if you would grant an extension of the term of thirty days mentioned in your letter.

Yours very truly,

RRJ/LVM

MARKS & CLERK.

Exhibits.

A. (At Trial.) Record file, Bayer application for Canadian Letters Patent No. 265,601. (11) Letter, Acting Commissioner of Patents to Marks & Clerk, 20th February 1926.

C/D
No. 297,541.

February 20, 1926.

Gentlemen,—

I am in receipt of your letter of the 11th instant in the matter of the possible conflict between application Serial No. 297,541, E. C. Bayer, and an application filed under Serial No. 307,847, J. A. Rice.

In view of the fact that your client resides in Denmark, I am pleased to extend the period of sixty days given by the Commissioner on the 3rd instant for a further thirty days.

The applicants in the possibly conflicting applications are required to amend to avoid the possibility of conflict on or before the 3rd of May, 1926.

I am advising the attorney in application Serial No. 307,847 of the further delay.

Your obedient servant,

(Sgd.) THOS. L. RICHARD,
Acting Commissioner of Patents.

Messrs. Marks & Clerk,
128 Wellington Street,
Ottawa, Ont.

---

(12) Letter, Marks & Clerk to Commissioner of Patents, 28th April 1926.

PATENT OFFICE,
April 28, 1926.

MARKS & CLERK CANADA

Canadian and Foreign Patents and Trade Marks.

128 Wellington Street,
Ottawa, Canada.

April 28, 1926.

The Commissioner of Patents,
Ottawa, Ontario.

Serial No. 297,541,
Erik Christian Bayer.

Sir,—

It is thought that the conflict will be avoided by cancelling applicant's claims 7 and 8 and by substituting a new claim 7 reading as follows:

"The process as claimed in Claims 1 characterised in that glue, casein or other gelatinizing substances are added to the soap solution."

If you will return to us one copy of applicant's specification, these amendments will be made, and it is trusted that conflict can be avoided in this way.

We are, Sir,

Your obedient servants,

RRJ/IB MARKS & CLERK.

Exhibits.

A. (At Trial.) Record file, Bayer application for Canadian Letters Patent No. 265,601.

PATENT AND COPYRIGHT OFFICE.

Communications should be addressed
" The Commissioner of Patents "
" OTTAWA " CANADA PATENT OFFICE
OTTAWA, April 30, 1926.

when writing on this subject refer to Serial Number of application.

Gentlemen,—

Application Serial No. 297,541.
Applicant, E. C. Bayer.

I have the honour to acknowledge the recept of your letter of the 28th instant, and in reply to inform you that the same will meet with due attention.

(13) Letter, Commissioner of Patents to Marks & Clerk, 30th April 1926.

Your obedient servant,
GEO. F. O'HALLORAN,
Commissioner.

To: Marks & Clerk,
128 Wellington Street,
Ottawa, Ont.

No. 297,541. May 4, 1926.

(14) Letter, Acting Commissioner of Patents to Marks & Clerk, 4th May 1926.

Gentlemen, -

Re Possible conflict between application No. 297,541, E. C. Bayer, and application No. 307,847, J. A. Rice.

With further reference to your letter of the 28th ultimo in the matter of application Serial No. 297,541, E. C. Bayer, I beg to inform you that the Examiner advises that the proposed claim will not avoid the conflict inasmuch as the new claim is not properly based on claim 1 and the broad claims still remain.

Your obedient servant,
(Sgd.) THOS. L. RICHARD,
Acting Commissioner of Patents.

Messrs. Marks & Clerk,
128 Wellington Street,
Ottawa, Ont.

Exhibits.

A. (At Trial.) Record file, Bayer application for Canadian Letters Patent No. 265,601, (15) Letter, Marks & Clerk to Commissioner of Patents, 6th May 1926.

PATENT OFFICE,
May 6, 1926,
CANADA

MARKS & CLERK
Canadian and Foreign Patents and Trade Marks,
128 Wellington Street,
Ottawa, Canada.

May 6, 1926.

The Commissioner of Patents,
Ottawa, Ont.

Serial No. 297,541,
Erik Christian Bayer.

Sir,—

We have your letter of the 4th instant and note that the proposed amendment does not avoid conflict in the Examiner's opinion. Kindly state what claims are still regarded as being in conflict. We gather from correspondence with our client that applicant is desirous of avoiding interference and we trust that declaration of conflict may be postponed to give applicant an opportunity of filing a further amendment.

We are, Sir,

Your obedient servants,
MARKS & CLERK.

RRJ/IB

---

(16) Patent Office Memorandum, 11th May 1926.

DOMINION OF CANADA.

MEMORANDUM to Mr. Richard: PATENT OFFICE.

OTTAWA, May 11, 1926.

My memo. of Jan. 30 stated, "There is conflict between applications 297,541 and 307,847 involving all the claims of the former and claims 1, 2, 8 and 9 of the latter."

Your communication to Messrs. Marks & Clerk appears to have omitted informing them that the conflict involves all the claims of the application in their charge.

M. L. RUSH.
PATENT OFFICE,

Exhibits.

A. (At Trial.) Record file, Bayer application for Canadian Letters Patent No. 265,601. (17) Letter, Marks & Clerk to Commissioner of Patents, 20th May 1926.

May 20, 1926.

MARKS & CLERK. CANADA.

Canadian and Foreign Patents and Trade Marks.
128 Wellington Street,
Ottawa, Canada.

May 20, 1926.

The Commissioner of Patents,
Ottawa, Ont.

Serial No. 297,541,
Erik Christian Bayer.

"Process of manufacturing porous building materials."

Sir,—

With further reference to our letter of the 6th instant with reference to the probable conflict between this application and application No. 307,847, J. A. Rice, we wish to point out that there appears to be no conflict between the claims of these two applications. The Rice application claims a foaming agent and a process of producing a lather for use in cellular concrete, while the claims of this application define a process of manufacturing porous building materials.

It is noted that Canadian Patent No. 252,546, August 11, 1925, was granted to Rice and that it contains claims which appear to us to conflict with the present claims of this Bayer application. It would appear that the suggested conflict would more properly have been declared between the earlier Rice application and the present Bayer application.

In view of these circumstances it is respectfully requested that the suggested interference proceedings be abandoned and that this application be allowed under Section 19 of the Patent Act.

Respectfully submitted,

AEM/IB MARKS & CLERK.

Exhibits.

A. (At Trial.) Record file, Bayer application for Canadian Letters Patent No. 265,601.

(18) Letter, Commissioner of Patents to Marks & Clerk, 31st May 1926.

PATENT AND COPYRIGHT OFFICE.

Communications should be addressed
" The Commissioner of Patents,"
" OTTAWA " CANADA PATENT OFFICE.
OTTAWA, May 31, 1926.

When writing on this subject refer to serial number of application.

Gentlemen,—

Application Serial No. 297,541,
Applicant, E. C. Bayer.

I have the honour to acknowledge the receipt of your letter of the 20th instant and in reply to inform you that the same will meet with due attention.

Your obedient servant,
GEO. F. O'HALLORAN,
Commissioner.

Marks & Clerk,
128 Wellington Street,
Ottawa, Ont.

PATENT AND COPYRIGHT OFFICE

Communications should be addressed
" Commissioner of Patents "
" OTTAWA "

CANADA PATENT OFFICE

When writing on this subject refer to serial number of application

OTTAWA, June 15th, 1926.

(19) Letter, Commissioner of Patents to Marks & Clerk, 15th June 1926.

NOTICE OF ALLOWANCE

APPLICATION FOR PATENT — Serial No. 297,541; Inventor E. C. Bayer; Invention: Processes of Manufacturing Porous Building Materials.

I beg to inform you that the above application for patent has been examined and allowed.

The final fee, TWENTY DOLLARS, must be paid not later than six months from the date of this notice of allowance.

A. (At Trial.) Record file, Bayer application for Canadian Letters Patent No. 265,601.

The Serial Number of Application, full Name of Inventor, Title of Invention, and Date of Allowance MUST be given when paying the final fee.

The preparation of the patent for signing and sealing will require about six weeks, and such work will not be undertaken until after the payment of the final fee. The Office delivers the Patent upon the day of its date.

The Patent will be published in the Canadian Patent Office Record of the date of the issue of the Patent.

Your obedient servant,
GEO. F. O'HALLORAN,
Commissioner.

Messrs. Marks & Clerk,
128 Wellington Street,
Ottawa, Ont.

(19) Letter, Commissioner of Patents to Marks & Clerk, 15th June 1926—*continued.*

MARKS & CLERK
Patents, Trade Marks, Copyrights
220 Broadway,
New York.

PATENT OFFICE
Sept. 20, 1926.
CANADA.

(20) Letter, Marks & Clerk to Commissioner of Patents, 16th September 1926.

Hon. Commissioner of Patents,
Ottawa, Canada.

September 16, 1926

Sir,—

Re : E. C. Bayer Canadian Pat. Appln. No. 297,541
Allowed June 15, 1926 (Our Case No. 26738)

We enclose herewith certified check for Twenty Dollars covering payment of the final Government fee on the above application and we await the patent document in due course.

Yours respectfully,
MARKS & CLERK.

TL
ENCL.

PATENT OFFICE—CANADA

(21) Receipt for Patent fee, 20th September 1926.

PATENT AND COPYRIGHT OFFICE
September 20, 1926

Received from E. C. Bayer.....

$20.00 — No. 510638

Patent fee

J. P. Beaudoin
Accountant
B.B.

Exhibits.

A. (At Trial.) Record file, Bayer application for Canadian Letters Patent No. 265,601 —*continued.*

(22) Letter, Commissioner of Patents to Marks & Clerk, 23rd September 1926.

PATENT AND COPYRIGHT OFFICE.

Communications should be addressed "The Commissioner of Patents" "OTTAWA"

When writing on this subject refer to serial number of application

CANADA PATENT OFFICE.

OTTAWA, September 23, 1926.

Gentlemen,—

Application Serial No. 297,541

Applicant E. C. Bayer

I have the honour to acknowledge the receipt of the final fee in the above application and to advise that the patent will issue under date Nov. 9th, 1926.

Your obedient servant,
GEO. F. O'HALLORAN
Commissioner.

Marks & Clerk,
128 Wellington Street,
Ottawa, Ont.

Received .....
Petition .....
.....
.....
Representative .....
Power of Att'y. .....
.....
.....
Associate P/A .....
Oath .....
.....
.....
Specifications .....
.....
.....
Third Claims .....
Tracings .....
.....
.....
C. B. Drawings .....
.....
.....
Letters of Admin .....
.....
.....
Surrender .....
Original Patent .....
Assignment .....
.....
.....
Papers correct .....

Z 2

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

PATENT

No. 265,601

Date Nov. 9, 1926.

FEES RECEIVED.

Filing Fee $15.00 .....
Reinstatement Fee .....
Restoration Fee .....
Final Fee : $20.00 .....

Assignment fees.	Assignments Recorded
(1) $.....	.....
(2)	.....
(3)	.....
(4)	.....

CARDBOARD .....

DRAWINGS .....

Ready for Issue
June 15, 1926.
Notice of Allowance
June 15, 1926.
Patent Mailed
Nov. 9, 1926.

COST OF COPIES.

Patent	$4.00	Petition	$0.25
Specification	1.00	Oath	.25
Drawing		Corres, etc.	2.25
Claims		Record file	

PATENT OFFICE.

APPLICATION FOR PATENT.

No. 297,541. Filed December 3-6, 1924.

APPLICANT :	ATTORNEY :
E. C. BAYER,	MARKS & CLERK, 128 Wellington Street, Ottawa, Ont.

INVENTION :

"PROCESS OF MANUFACTURING POROUS BUILDING MATERIALS"

ACTION : Acknowledged by Circular 1, and receipt mailed December 20, 1924. Let. Oct. 30/30/15 Ack'd Nov. 28/25 Attys. Notified of possible conflict Feb. 3/26 and claims mailed (60 days to amend) (R) Let. Feb. 11/11/26 ans'd and time to amend extended to May 3/26, Feb. 20/26 (R) Let. Apr. 28/28/26 Ack'd Apr. 30/26 Attys. Written to May 4/26 Let. May 6/6/26. Let. May 20/20/26 Ack'd May 31/26. Let. and $20.00 from N.Y. Office Sept. 16/20/26. Rec. M'L'D Sept. 23, 1926.

Exhibits.
A. (At Trial.) Record file, Bayer application for Canadian Letters Patent No. 265,601 —*continued.*
(23) Patent Office Memoranda

Exhibits.

2. (At Trial); and 1. (Evidence on Commission.) Certified copy Bayer Canadian Letters Patent No. 265,601, 9th November 1926.

2. (At Trial); and 1. (Evidence on Commission.) Certified copy Bayer Canadian Letters Patent No. 265,601.

DOMINION OF CANADA

PATENT OFFICE

CERTIFIED TO BE true and correct copies of the original Petition, Oath, Specification and Claims remaining on record in this office, relating to Patent No. 265,601, bearing date the 9th day of November, 1926, and granted to ERIK CHRISTIAN BAYER, for " PROCESSES OF MANUFACTURING POROUS BUILDING MATERIAL."

AS WITNESS the seal of the Patent Office hereto affixed at the City of Ottawa in the Dominion of Canada, this 11th day of October, in the year of our Lord one thousand nine hundred and twenty-eight.

THOS. L. RICHARD,
Commissioner of Patents.

SEAL

APPLICATION FOR CANADIAN PATENT.

Petition with Power of Attorney.

To the Commissioner of Patents,
Ottawa.

The petition of Erik Christian Bayer, a subject of the King of Denmark, residing at 21 Nordre Frihavnsgade 21, Copenhagen, in the Kingdom of Denmark, showeth :—

That he hath invented new and useful Improvements in Processes of Manufacturing Porous Building Materials, not known or used by others before his invention thereof, and not patented or described in any printed publication in this or any foreign country more than two years prior to this application and not in public use or on sale in this country for more than two years prior to this application.

Your petitioner, therefore, prays that a Patent may be granted to him for the said invention, as set forth in the specification in duplicate relating thereto.

Said petitioner hereby appoints A. E. MacRae, Patent Attorney, Resident Manager of Marks & Clerk, 128 Wellington Street, in the city of Ottawa, Province of Ontario, to represent him and stand in his place and stead for all the purposes of the Patent Act including the service of any proceedings taken thereunder.

Your petitioner also hereby appoints Messrs. Marks & Clerk, of No. 128 Wellington Street, Ottawa, Canada, his attorneys, with full power of

substitution and revocation, to prosecute this application, to make alterations and amendments therein, to receive the Patent, and to transact all business in the Patent Office, connected therewith.

Signed at Copenhagen, this 4th day of Septbr. 1924.

(Sgd.) ERIK CHRISTIAN BAYER.

WITNESS:
G. COHEN.

OATH.

Denmark
(County)
Copenhagen
(State or Province) } S.S.
(County or District) }

I ERIK CHRISTIAN BAYER, a subject of the King of Denmark, residing at 21 Nordre Frihavnsgade, Copenhagen, Denmark, make oath and say that I verily believe that I am the inventor of the new and useful improvements in "PROCESSES OF MANUFACTURING POROUS BUILDING MATERIALS," described and claimed in the specification relating thereto and for which I solicit a Patent by my petition, dated September 4, 1924. That no application for a patent for said improvements has been filed by me or others with my knowledge or consent in any foreign country, except as follows: Germany, German Patent Application No. 111,020, filed on September 8, 1923.

And I further say that the several allegations contained in the said petition are respectively true and correct.

(Sgd.) ERIK CHRISTIAN BAYER.

Sworn before me, at Copenhagen, this fourth day of September 1924.

(Sgd.) JOHN B. DAVIE.
British Vice-Consul.

Stamp

Stamp.

Patent No. 265601
Dated Nov. 9, 1926
Filed Dec. 6, 1924
.....
1½.....
11–10–28
S.A. M. McC.

SPECIFICATION.

To all whom it may concern:

Be it known that I, Erik Christian Bayer, a subject of the King of Denmark, residing at 21 Nordre Frihavnsgade, Copenhagen, in the kingdom

Exhibits.

2. (At Trial); and 1. (Evidence on Commission.) Certified copy Bayer Canadian Letters Patent No. 265,601, 9th November 1926 —*continued.*

of Denmark, have invented new and useful improvements in processes of manufacturing porous building materials, of which the following is a specification.

This invention relates to the process of manufacturing porous building materials and the like from mineral substances, which are mixed with water or other fluids, for instance cement or plaster of paris.

The invention consists in the employment of a foam in connection with the mixing fluid in order to make the materials porous. The inventor has found that by a suitable choice of such substances a foam may be produced, which during the ensuing formation of the material is sufficiently durable, so that a number of air bubbles are left in the mass.

The manufacturing may be effected in such a manner that the foam developing substance is added to the mixing fluid or to a mixture of this fluid and the substances, which are to be mixed with the fluid, after which the foam is developed by a vigorous stirring of the mass or by the introduction of compressed air or carbonic acid. In most cases it will be best to add foam already developed from a frothy liquid to the mixing fluid or to the mixture of this fluid and the substance to be mixed herewith. By manufacture on a larger scale the foam may thus be developed from a frothy liquid in a special machine and then be transferred to a mixing machine of known construction, so that the foam is introduced in the mixture instead of, or simultaneously with, sand or other filling substances.

As foam developing substances there may be used different sorts of mucilage, for example a substance produced from sea-tangle or sea-weed called tangin. The durability of the foam developed from these substances may be augmented by adding gelatine. The quantities of these substances to be used are quite small so that the process is also very cheap.

In certain cases further durability of the foam has been obtained by adding a small portion of formaldehyde.

Besides the above-named substances experiments have shown that soluble soaps, especially resin, soda or resin-potash soap, are well adapted for this end. Such soaps possess the power of developing a very stiff and durable foam, which is highly adapted to be mixed with the materials without bursting the foam bubbles, so that the degree of porosity required may be obtained, especially if mucilage, caseines or other gelatinated substances be added to these resin-soaps.

I CLAIM

1. The process of manufacturing porous building materials of substances which are mixed with water or other fluids, consisting in the employment of foam in connection with the materials to obtain a porous substance.

2. The process of manufacturing porous building materials or substances which are mixed with water or other fluids, consisting in the addition of a foam developing substance to the mixing fluid.

3. The process of manufacturing porous building materials or substances which are mixed with water and other fluids and in which is employed a

Exhibits.

foam or foam developing substance, consisting in the employment of a mucilage as foam developing substance.

4. The process of manufacturing porous building materials or substances, consisting in the addition of gelatine to the foam developing substance.

5. The process of manufacturing porous building materials or substances, consisting in the employment of formaldehyde in foam.

6. The process of manufacturing porous building materials or substances, consisting in the employment of a soap solution as foam developing substance.

7. The process of manufacturing porous building materials or substances in which soap solution is employed as foam developing substance, consisting in the employment of resin-soap for the production of said soap solution.

8. The process of manufacturing porous building materials or substances in which a resin-soap solution is employed as foam developing substance, consisting in the addition to the resin-soap solution of mucilage, caseines or other gelatinated substances.

SIGNED AT Kjobenhavn this 4th day of September, 1924.

(Sgd.) ERIK CHRISTIAN BAYER.

2. (At Trial); and 1. (Evidence on Commission.) Certified copy Bayer Canadian Letters Patent No. 265,601, 9th November 1926 —*continued.*

---

3. (Evidence on Commission.) Assignment Bayer to Christiani and Nielsen of Canadian Patent No. 265,601.

ASSIGNMENT
No. 140,923.

Application No.
Patent No. 265,601.

E. C. Bayer,
to
Christiani and Nielsen,
for
Processes of manufacturing porous building material.

Territory

All interest

Recorded in the Patent and Copyright Office, at Ottawa, this 27th day of September, 1927, as witness the seal of the Patent Office.

(Sgd.) M. J. MORISON,
Assignment Clerk.

(SEAL)

3. (Evidence on Commission.) Assignment Bayer to Christiani and Nielsen of Canadian Patent No. 265,601, 7th September 1927.

Exhibits.

3. (Evidence on Commission.) Assignment Bayer to Christiani and Nielsen of Canadian Patent No. 265,601, 7th September 1927 —*continued.*

ASSIGNMENT.

In consideration of the sum of One Dollar ($1.00) to me paid by Christiani and Nielsen, Raadhusplads 77, Copenhagen K.

I do hereby, sell and assign to the said Christiani and Nielsen, all my right, title and interest in and to the Patent of Canada, No. 265,601, for "PROCESS OF MANUFACTURING POROUS BUILDING MATERIAL", granted to me November 9, 1926, the same to be held by and enjoyed by the said Christiani and Nielsen to the full end of the term for which said Patent is granted, as fully and entirely as the same could have been held and enjoyed by me if this assignment and sale had not been made.

Witness my hand and seal this 7th day of September, 1927, at Copenhagen.

(Sgd.) ERIK CHRISTIAN BAYER.

(BRITISH CONSULATE)

(STAMPS)

(SEAL)

This is exhibit 3 referred to in the evidence of Erik Christian Bayer, declared before me this 14th day of August, A.D. 1928.

(Sgd.) JOHN B. DANO,
British Vice-Consul,
Copenhagen.

---

1. (At Trial.) Certified copy Rice Canadian Letters Patent No. 252,546, 11th August 1925.

1. (At Trial.) Certified copy Rice Canadian Letters Patent No. 252,546.

DOMINION OF CANADA

PATENT OFFICE

STAMPS

CERTIFIED that the annexed is a true copy of a Patent registered in the Patent Office under number 252,546, granted to John A. Rice, and bearing date the 11th day of August, 1925, for "CELLULAR CEMENT PRODUCTS AND PROCESSES OF MAKING SAME" (Application for which was filed June 13, 1924) with true copy of the specification remaining on record in this office, duplicate copy of which was attached to the Patent above mentioned.

AS WITNESS the seal of the Patent Office hereto affixed at the City of Ottawa in the Dominion of Canada, this 30th day of September in the year of our Lord one thousand nine hundred and twenty-seven.

(sgd.) THOS. L. RICHARD
ACTING COMMISSIONER
OF PATENTS

Exhibits.

1. (At Trial.) Certified copy Rice Canadian Letters Patent No. 252,546, 11th August 1925—*continued.*

DOMINION OF CANADA

NUMBER 252546

TO ALL TO WHOM THESE PRESENTS SHALL COME

WHEREAS JOHN A. RICE

of Berkeley, California, U.S.A.

has petitioned the COMMISSIONER OF PATENTS praying for the grant of a Patent for an alleged new and useful Improvement in CELLULAR CEMENT PRODUCTS AND PROCESSES OF MAKING SAME,

a description of which invention is contained in the specification, of which a duplicate is hereunto attached, and made an essential part hereof and has complied with the requirements of The Patent Act.

NOW THEREFORE THE PRESENT PATENT grants to the said

JOHN A. RICE

his executors, administrators, legal representatives and assigns for the period of eighteen years from the date of these presents, the exclusive right, privilege and liberty of making constructing and using, and vending to others to be used, in the Dominion of Canada, the said invention, subject nevertheless to adjudication before any Court of competent jurisdiction.

PROVIDED that the grant hereby made is subject to the conditions contained in the Act aforesaid.

(L.S.)

IN TESTIMONY WHEREOF, I have hereunto set my hand and caused the Seal of the Patent Office to be hereunto affixed, at the City of Ottawa, in the Dominion of Canada, this Eleventh day of August in the year of Our Lord, one thousand nine hundred and twenty-five.

(Sgd.) THOS. L. RICHARD
Acting Commissioner of Patents

Exhibits.

SPECIFICATION 25546

1. (At Trial.) Certified copy Rice Canadian Letters Patent No. 252,546, 11th August 1925—*continued.*

TO ALL WHOM IT MAY CONCERN:

Be it known that I, JOHN A. RICE, Chemical Engineer,

Here state name and occupation of applicant

of Berkeley, County of Alameda, State of California, U.S.A., having invented certain new and useful improvements in

CELLULAR CEMENT PRODUCTS AND PROCESS OF MAKING SAME

do hereby declare that the following is a full, clear, and exact description of the same:

The present invention relates to improvements in plastic compositions and its particular object is to provide a cellular composition or product adapted to be used for walls, constructional purposes, fireproofing of the frame work of steel buildings and practically all purposes that concrete can be used for and that is not only considerably lighter in weight than the concrete mixtures now commonly used but it contains a large number of cellular voids adapted to improve the heat insulating and sound-insulating properties of the material. The invention embraces especially a method of impregnating cement while in a dry or soft state with gas bubbles preferably produced by whipping a gelatinous substance in the presence of water into a foam or lather, the said material being preferably rendered tenacious or hardened, as by formaldehyde. The bubbles thus formed mix readily with the cement and occupy space within the same and in this respect may be described as taking the place of gravel or rock now commonly used in the mixing of concrete in addition to sand. My mixture comprises suitable proportions of Portland or other cement, and foam and preferably sand. Of course gravel may be also added if desired. In referring to cements I wish to state that this expression is intended to include clay, magnesite cement, plaster of paris, keiselguhr and similar cementitious materials.

The preferred form in which the principle of my invention may be executed will be described in the following specification but it is to be understood that various changes or modifications may be made within the scope of the annexed claims without departing from the spirit of the invention.

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
98⅘%	water
1/5 of 1%	formalin solution (containing say about 40% of 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 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.

This foam is then mixed in suitable proportions with the cement mixture or with powdered cement material which process results in the gas bubbles of the foam being thoroughly and more or less homogeneously incorporated in the cement mixture. The bubbles remain as such (without bursting) until the cement has set and produce thereby a stable body with a large number of cellular voids therein.

In other cases I have found glue solutions of a much lower strength to be very suitable, thus a solution of about one part of 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 viscous, 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 very 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 solution, starch paste (boiled) Irish moss, agar 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 to acetone.

Exhibits.

1. (At Trial.) Certified copy Rice Canadian Letters Patent No. 252,546, 11th August 1925—*continued.*

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, ammonium aterate, 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:

(i) 500 parts by volume of 2% glue solution.
6000 „ „ „ „ cold water.
25 „ „ „ „ rosin solution in ammonia (about 0·5% solution)
½ „ „ „ „ "Cresol Compound U.S.P."

(k) 2000 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 H2 S04) to gelatine 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, aluminium, sulfate, aluminium chlorid, 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 A12 (S04) 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 a 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).

By the use of the limitation "tenacious and stable" when referring to the foam, I wish it to be understood that the limitation is intended to designate a tenacious foam or such a foam that the thin films forming the bubbles are sufficiently strong to be maintained when mixed with a mortar or cement.

My invention is applicable to the preparation of any material which hardens or sets on drying; that is to say, a preformed more or less permanent foam may be added to any wet or dry mortar no matter what the binder material therein may be, and no matter what filler materials may be present in the mortar, provided that said mortar hardens or sets on drying. As a matter of fact, the bubbles themselves may be used to replace the large aggregate sometimes used in making concretes of various types; that is to say, I may replace the large aggregate by voids.

I have indicated above a number of substances and methods for producing the foam or froth which is to be added to the mortar, but I wish it to be distinctly understood that my invention, in its broad aspects, is not limited thereto, inasmuch as any foam, no matter how made and no matter of what it may consist, falls within the scope of my invention.

I CLAIM:

1. A shaped product comprising a mixture of cement material and tenacious stable foam.

2. The process of producing a cellular product which consists in mixing a tenacious stable foam, with a cement material and allowing the mixture to harden.

3. The process of producing a cellular cement composition which consists in mixing a gelatinous substance of foamy consistency with a plastic cement material and allowing the mixture to harden.

4. The process of producing a cellular product which consists in mixing a foam containing a gelatinous substance with a plastic hydraulic cement material and allowing the mixture to dry and harden.

5. A process which comprises forming a stiff tenacious stable foam, mixing such foam into a mortar, and allowing the product to harden.

6. A process which comprises forming a stiff tenacious stable foam from a gelatinous colloidal liquid, mixing such foam into a mortar, and allowing the product to harden.

7. The process of producing a cellular cement product which comprises whipping a protein containing liquid capable of forming a foam, into a stiff foam to form gas bubbles and mixing the foam into a cement.

Exhibits.

1. (At Trial.) Certified copy Rice Canadian Letters Patent No. 252,546, 11th August 1925—*continued.*

8. The process of forming a cellular cement which comprises forming a tenacious foam and mixing the foam with a cement.

9. A process which comprises converting a viscous liquid into a tenacious stable foam, and mixing such foam with a cement mass, and causing the same to solidify without rupturing the major part of said bubbles.

10. A process which comprises the steps of distributing a preformed foam, throughout the mass of a mortar, and allowing the mortar to harden, while maintaining the foam in an unbroken condition.

11. The process of producing a cellular cement composition which consists in sufficiently agitating a colloidal substance to provide many separate globules containing entrapped gas, mixing said substance with cement, and allowing the mixture to harden.

12. The process of producing a cellular cement composition which consists in agitating a protein substance to form globules of entrapped gas, mixing said substance with cement, and allowing the mixture to harden and dry.

13. The process of producing a cellular cement which comprises whipping a mixture of 1 per cent. of glue, 98 4/5 per cent. of water and 1/5 of 1 per cent. formalin into a stiff foam, for creating bubbles and stirring the foam into a cement.

14. The process of producing a cellular cement which comprises whipping a mixture of glue, water and formalin into a stiff foam to form gas bubbles and stirring the foam into a cement.

15. The process of producing a cellular cement which comprises whipping a protein, water and formalin into a stiff foam to form gas bubbles and stirring the foam into a cement.

16. The process of producing a cellular cement which comprises whipping a protein and an indurating agent into a stiff foam to form gas bubbles and stirring the bubbles into a cement.

17. A composition of matter comprising a mixture of gas bubbles formed of whipped protein, water and formalin and a cement.

18. A composition of matter comprising a mixture of 1 per cent. of glue, 98 per cent. of water and 1/5 of 1 per cent. formalin whipped into a foamy consistency and cement.

19. The process of producing a cellular cement which comprises whipping a protein capable of forming a foam into a stiff foam to form gas bubbles and stirring the foam into a cement.

20. The process of forming a cellular cement which comprises forming a tenacious foam and mixing the foam with a cement.

SIGNED at Ottawa, Province of Ontario, Canada, this 13th day of June, 1924.

(Sgd.) JOHN A. RICE.

CHRISTIANI v. RICE.
DOMINION OF CANADA
PATENT OFFICE.

(No. 8716 Ex. No. 1 (PX 2) C.M. R.C.C.

CERTIFIED TO BE true and correct copies of the original Petition and Oath remaining on record in this office relating to Patent No. 252,546, bearing date the 11th day of August, 1925, and granted to John A. Rice for " CELLULAR CEMENT PRODUCT AND PROCESS OF MAKING SAME."

AS WITNESS the seal of the Patent Office hereto affixed at the City of Ottawa in the Dominion of Canada this 6th day of December, in the year of our Lord one thousand nine hundred and twenty-eight.

(Sgd.) THOS. L. RICHARD,
Commissioner of Patents.

PETITION WITH POWER OF ATTORNEY

FOR CANADIAN PATENT

PETITION.

To the Commissioner of Patents, Ottawa :

The Petition of JOHN A. RICE, Gentleman, a citizen of the United States, residing at Berkeley, County of Alameda, and State of California, U.S.A., showeth :

That he has invented new and useful Improvements in CELLULAR CEMENT PRODUCT AND PROCESS OF MAKING SAME not known or used by others before his invention thereof, not patented or described in any printed publication in this or any foreign country more than two years prior to this application and not in public use or on sale in this country for more than two years prior to this application.

Said petitioner, therefore, prays that a Patent may be granted to him for the said invention, as set forth in the specification in duplicate relating thereto.

JOHN A. RICE.

Ottawa, Ont., June 13, 1924.

Exhibits.

1. (At Trial.) Certified copy Rice Canadian Letters Patent No. 252,546, 11th August 1925—*continued.*

OATH.

CANADA
PROVINCE OF ONTARIO } S.S.
OTTAWA

I, JOHN A. RICE, Gentleman, of Berkeley, County of Alameda, State of California, U.S.A., make oath and say that I verily believe that I am the Inventor of the new and useful improvements in "CELLULAR CEMENT PRODUCT AND PROCESS OF MAKING SAME," described and claimed in the specification relating thereto, and for which I solicit a Patent by my petition, dated 13th June, 1924.

And I further say that no application for a patent for said improvements has been filed by me or others with my knowledge or consent, in any foreign country except as follows: United States of America, application filed Dec. 21, 1922, Ser. No. 608,349, and application filed May 29, 1924, Ser. No. 716,824.

And I further say that the several allegations contained in the said petition are respectively true and correct.

(Sgd.) JOHN A. RICE,

SWORN before me, at Ottawa, Province of Ontario, this 13th day of June, 1924.

(Sgd.) D. McCARTHY,
A Comms. in and for the
Supreme Court of Ontario.

---

4. (At Trial.) Stipulation—Admissions of Parties, 5th December 1928.

4. (At Trial.) Stipulation—Admissions of Parties.

IN THE EXCHEQUER COURT OF CANADA.

BETWEEN:

FRITS RICDOLF CHRISTIANI and AAZE NIELSEN, trading under the name, firm and style of Christiani & Nielsen, and the said CHRISTIANI & NIELSEN,

Plaintiffs;

AND

JOHN A. RICE,

Defendant.

STIPULATION.

For the purposes of the trial of this action the parties make the following admissions:

1. The Defendant admits the title of the Plaintiffs to Letters Patent Number 265,601, referred to in the Statement of Claim.

2. Any foreign Patent may be proved by the production of the usual printed copy of said foreign Patent, and the dates appearing on the said Patent as the date of issue and the date of filing of the application therefor shall be proved prima facie by the production of the said printed copy, and any application for patent in a foreign country may be proved by the production of a copy certified under the seal of the patent office in which it was filed.

DATED at Ottawa this 5th day of December, A.D. 1928.

HENDERSON & HERRIDGE,
Solicitors for the Plaintiffs.

10

SMART & BIGGAR,
Solicitors for the Defendant.

In the Privy Council.

No. 114 of 1930.

On Appeal from the Supreme Court of Canada.

BETWEEN

JOHN A. RICE - - (*Defendant*) *Appellant*

AND

FRITS RICDOLF CHRISTIANI and AAZE NIELSEN trading under the name firm and style of CHRISTIANI & NIELSEN and the said CHRISTIANI & NIELSEN

(*Plaintiffs*) *Respondents.*

RECORD OF PROCEEDINGS.

LAWRENCE JONES & Co.,
Lloyd's Building,
Leadenhall Street, London, E.C.3,
For the Appellant.

BLAKE & REDDEN,
17, Victoria Street, London, S.W.1,
For the Respondents.

EYRE AND SPOTTISWOODE, LTD., EAST HARDING STREET, E.C.4.