1935

Feb. 11 & 12.
May 29.

AKTIENGESELLSCHAFT FUER STICKSTOFFDUENGER ..... } PLAINTIFF;

AND

SHAWINIGAN CHEMICALS LIMITED...DEFENDANT.

Patents—Conflict—Abandonment at trial of application by one party—Disposition of matter.

Held: That the defendant in a conflict action having abandoned his application for a patent at trial, and consequently there then being no conflict in the claims of rival applicants to consider, the proper disposition of the matter is to declare that the plaintiff is entitled to a patent or refer the matter back to be disposed of by the Commissioner of Patents.

ACTION brought before this Court, under Section 22 of The Patent Act, for a declaration as to who, as between plaintiff and defendant, was the first inventor of the subject matter of their applications for patent, in respect of which the Commissioner of Patents had declared a conflict.

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

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

E. G. Gowling and *D. K. MacTavish* for defendant.

The facts are stated in the reasons for judgment.

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THE PRESIDENT, now (May 29, 1935) delivered the following judgment:

The plaintiff corporation, which may be abbreviated to "Aktien," has its chief office at Cologne, Germany, while that of the defendant is at Shawinigan Falls, in the Province of Quebec. The plaintiff is the assignee of Ernst Winter and Fridolin Hartman, hereinafter to be referred to as Winter only, who, on January 19, 1931, made application for a patent in Canada on a certain invention relating to improvements in "Pressed Calcium Oxide Powder and Calcium Hydroxide Powder." Prior to the issue of any patent on the said application, one Williams, the defendant's assignor, on June 27, 1933, filed an application for a patent of an invention designated as a "Process of Making Calcium Carbide."

The Commissioner of Patents, being of the opinion that each application would be allowed if each did not contain claims nearly identical, notified the respective applicants, pursuant to sec. 22 (1) of the Patent Act, of an apparent conflict of claims, and subsequently affidavits were filed pursuant to sec. 22 (2) of the Act by Winter and Williams. Winter, in his affidavit, alleged that the idea of the invention, the subject matter of his application, was conceived on March 31, 1926, and first experimentally practised in the same year; and Williams, in his affidavit, alleged that he conceived the idea of his invention, the subject matter of his application, prior to the month of July, 1926, and first experimentally practised the said invention in the said month, and again in the period between July, 1920, and November, 1921. On May 23, 1934, the Commissioner of Patents notified the plaintiff that, on the facts appearing in the said affidavits, the claims in conflict would be allowed to Williams, unless proceedings as required by sec. 22 (4) of the Patent Act were instituted within two months, and accordingly the plaintiff commenced this action.

Thereupon the Commissioner of Patents suspended further proceedings on both applications until it was determined either, (1) that there is no conflict between the claims in question, or (2) that neither of the applicants is entitled to the issue of a patent containing the claims in conflict as applied for by him, or (3) that a patent or patents, including substitute claims approved by the Court,

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may issue to one or other of the applicants, or (4) that one of the applicants is entitled as against the other to the issue of a patent including the claims in conflict as applied for by him. The defendant now concedes that it is not entitled to the issue of a patent, but it contends that neither is the plaintiff entitled to the issue of a patent, on grounds later to be mentioned, but if so, then with certain limitations as to claims.

Before proceeding further it might be useful to explain, as accurately as I can, just what was the alleged invention claimed by the respective parties at the date of the filing of their applications, and what was the problem for solution to which was directed the efforts of the respective applicants. In order to produce acetylene gas, a business in which both the plaintiff and the defendant were engaged at the times material here, it is necessary to add water to what is known as calcium carbide,—the latter being produced by fusing together lump lime, calcium oxide, with carbon in the form of coke, in a carbide furnace—and this causes a degree of heat which produces acetylene gas, there resulting therefrom a solid residue or waste product, calcium hydroxide, which is still calcium, and which is described as a wet mud-like sludge. If calcium hydroxide be heated there will be driven off the free water that made it sludge, but there will still remain calcium hydroxide, but when such of the water or moisture as is chemically combined with the calcium is driven off what remains is calcium oxide, and this, under certain conditions, may be used in a high temperature electrical furnace with carbon to produce again calcium carbide; what occurs is that the heat of the furnace drives off the oxygen and there remains calcium carbide from which there is produced acetylene gas with the resultant waste, calcium hydroxide, and this process may be repeated again and again.

But this process, prior to the times material here, apparently, was never successfully accomplished in practice. Attempts had been made to recover for re-use the lime from the waste product, calcium hydroxide, and such efforts took two different forms, first, to mix with the calcium hydroxide some form of binder, and then to briquette the same; the second method was to briquette the wet calcium hydroxide sludge. The latter method does not

seem to have been practically successful because the briquettes being porous would not stand up in the furnace and would crumble into dust, which, I understand, is an unfavourable form for successful use in the production of calcium carbide and acetylene gas. If a binder is used this makes the recovery of the lime from the waste product too expensive, and it is less costly and more satisfactory to purchase and use fresh lime in the process of producing calcium carbide and acetylene gas. The problem therefore was how best to reclaim the lime from the waste product, calcium hydroxide, for use in making calcium carbide for the manufacture of acetylene gas.

In these circumstances, it is alleged, Winter directed his attention to the employment of a waste material, calcium hydroxide, which came from a carbide furnace in a practically dry form, and, it is claimed, he experimented with the use of a practically dry calcium hydroxide obtained according to a process described in a patent owned by the plaintiff, and known as the dry generation process, and this waste material, calcium hydroxide, was found to be substantially free of water or moisture, and in the form of a white powder; this waste material would have a slight amount of free moisture, and this with the chemically combined moisture made it calcium hydroxide, but it was quite a dry material.

Now, Winter, being enabled to obtain, through the dry generation process, waste material in the form of a practically dry powder, proceeded to experiment with the same in order to ascertain how best it could be made into briquettes, or shaped bodies as it is called in Winter's specification, for use in the making of calcium carbide. He first experimented with the use of a lesser quantity of binder material than was ordinarily used for such purposes, but, it is said, it was found that the briquettes made in this way were too soft, or lacked sufficient resistance, for use in a high-temperature furnace, and also that they were found to be too expensive for commercial use. Unexpectedly, it is said, Winter discovered that he could obtain a more satisfactory briquette by merely compressing the practically dry waste material into a shaped body, without a binder. Here, says the plaintiff, was a waste material in the form of a wet sludge which if pressed into

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briquettes did not have sufficient resistance, or was too expensive, for successful use in a carbide furnace, but if that waste material was recovered in the form of a practically dry powder, but yet containing a small quantity of moisture, and to it was applied sufficient pressure the result was you got a briquette possessing sufficient resistance so that it could be handled and piled into a furnace; used in a carbide furnace with carbon, in order to make calcium carbide, the briquettes were found to have sufficient rigidity to stand up in the furnace. You could not use, it was said, calcium oxide in the form of dust or dry powder, and so Winter states he found the way to make a suitable briquette out of dry powder, either in the form of a dry calcium oxide powder, or a calcium hydroxide powder, practically without any moisture. The calcium hydroxide could be converted into calcium oxide by driving off the water or moisture with heat, and, as I understand it, it had to be got in the form of calcium oxide in order to get chemical action producing calcium carbide. By adding carbon to calcium oxide in a high temperature electrical furnace the oxygen would be driven off and the result would be calcium carbide. It is the product made by this method or process for which Winter has applied for a patent, and, it is said, that this constitutes invention, and that Winter was the first to conceive and complete the method or process of producing such a product.

Winter's alleged invention, as described in his application, and which may usefully be quoted in full, is as follows:

> The present invention relates to shaped bodies of calcium oxide powder and calcium hydroxide powder and a process of preparing them and a process of preparing calcium carbide from the shaped bodies.
>
> It is known to press moulded articles while applying pressure from calcium hydrate sludge which may previously be partially dehydrated and to calcinate the moulded articles so as to obtain solid calcium hydroxide. Lime sludge which has been well dried by causing it to deposit for a prolonged time or by centrifuging it is generally designated as "cut lime"; it still contains more than 50 per cent of free water which is retained in the colloidal lime. As in all the hardening processes hitherto known the separation of water of the gel masses is of decisive importance (see for instance "Zeitschrift fur angewandte Chemie" 42, page 1087, 1929) it has to be presumed in the case of more or less dehydrated lime sludge that the stability of the shape of the pressed bodies prepared therefrom is based upon a strengthening due to the separation of water of the gel mass, when stored and calcinated. A process based upon this knowledge could not introduce itself in the carbide works.
>
> We have now found that dry lime powder, i.e., practically anhydrous calcium hydrate and also quicklime powder, i.e., calcium oxide, and mix-

tures of these two dust-like powders, can be pressed without any addition so as to obtain moulded articles which are as hard as stone.

For pressing purposes, there may be used, for instance, the practically dry calcium hydroxide which is obtained during the gasification of calcium carbide according to the process described in Canadian Patent No. 298,173, and the calcium oxide produced from this calcium hydroxide.

Contrary to the above-named known process there is pressed, according to the present invention, a dust-dry practically anhydrous powder. It could not be foreseen that a starting material of this kind would show such an effect of sticking together and at the same time a very distinct after-hardening which would act for many weeks. The pressed moulded bodies can be calcinated if they are prepared from calcium hydrate without reducing their resistance.

The material may be pressed at ordinary or at a raised temperature. The upper limit of the temperature is not dependent on the material which is to be pressed, it is obvious from the mechanical resistance of the material from which the press is made.

The pressure depends upon the kind of the press used, the size of the pressed bodies and the nature of the material to be pressed. The lowest limit results from the desired resistance of the pressed bodies and may hardly be below 100 kilos per square centimeter. The resistance of the pressed bodies increases with the pressure. An upper limit of the pressure can, therefore, not be given.

In all known processes of briquetting for instance fine ores, dust from throat of furnace, purple ores, dust coal and the like there is worked with the addition of a binding agent, such as tar-like substances, bitumen, water and sometimes also with the addition of aqueous lime sludge. The capability of briquetting lignite is likewise based upon its content of bitumen and water, whereas it is new to use dry lime powder without any addition for preparing moulded bodies which are as hard as stone.

The progress of the invention is based upon the fact that for instance valuable products can be made from the waste products hitherto technically not utilizable of the manufacture of acetylene prepared on a large scale. The attempts which have hitherto been made with calcium hydrate sludge have not been successful, because the drying operation of the hydrous sludge was uneconomical. The dry lime powder itself is not utilizable instead of lump lime, for instance for the carbide furnace, but by treating it according to the present invention it is likewise rendered utilizable for these purposes. We have furthermore found that calcium carbide can be prepared in a particularly advantageous manner if there is used dry calcium oxide or calcium hydroxide which has been pressed into shaped bodies as above described instead of the lime calcinated from natural limestone. Calcium oxide powder obtained from calcium hydroxide powder is particularly capable of reacting. The powder itself cannot be used in the carbide furnace, but the shaped bodies obtained by pressing the powder are a very useful starting material for the manufacture of calcium carbide.

The natural lime always contains pieces of various granular size besides a certain amount of powder. Whereas the dust is blown away by the gases in the carbide furnace, variations in the optimum composition of the reaction mixture in the furnace are caused by the unregularities in the granular size of the material, a not uniform melting operation and disturbances in the working of the furnace thus taking place.

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Contrary thereto there is guaranteed by the shaped bodies artificially prepared from powder a considerably increased regularity in the feeding of the furnace and a better structure desired for the working of the furnace.

For the heat balance of the carbide furnace the thermal conductivity of the material is of importance. Whereas the thermal conductivity of the natural lime is given, that of the pressed powder can be regulated according to pressure and granular size so that the feeding acts in a heat isolating manner and thus reduces the noxious heat loss by radiation and conduction.

A further industrial progress obtained by the use of the artificially pressed lime for the preparation of carbide resides in the possibility to remove noxious impurities from the dust-like lime before the pressing operation by sieving or sifting it or by a magnetic separation and other known processes.

The following examples serve to illustrate the invention, but they are not intended to limit it thereto, the parts being by weight:—

(1) One ton of anhydrous lime powder is calcinated at a temperature of between 500° C-1,000° C and the 750 kilos of pulverized calcium hydroxide obtained are pressed, by means of an extrusion press or a hydraulic press under a pressure of between 700-1,000 kilos per square centimeter and at a temperature of between 20° C to 400° C. The material obtained possesses the resistance of calcinated lump lime.

(2) One ton of lime powder is pressed without a previous calcination while applying a pressure of 700-1,200 kilos per square centimeter. The briquettes obtained are calcinated in the shaft furnace; 750 kilos of quicklime are obtained.

When carrying out the process of the following claims 1 and 2, calcium oxide has to be regarded as equivalent of calcium hydroxide.

The following claims of Winter may be mentioned:

(1) The process which comprises pressing practically dry calcium hydroxide powder into a shaped body by applying a pressure of between 700-1,200 kilos per square centimeter.

(5) As a new article of manufacture a strongly coherent shaped body consisting of calcium oxide powder manufactured by pressing practically dry calcium hydroxide powder into a shaped body by applying a pressure of between 700-1,200 kilos per square centimeter, and by subsequently calcinating the shaped body.

It was urged on behalf of the plaintiff that the prior practice had been to use calcium hydroxide sludge with somewhere around 40 to 50 per cent of free water, and that the expression "practically dry" meant the use of a material which was substantially a dry material in comparison with the material previously used. And it was contended on behalf of the defendant, that the waste calcium hydroxide resulting from a dry generation process would normally contain between 3 and 5 per cent of moisture.

We may now conveniently refer to the affidavit filed by Winter and Hartman, as required by sec. 22 (2) of the Patent Act, and which is in part as follows:

We, Ernst Winter and Fridolin Hartman, being the applicants of the application Serial No. 373,424, filed January 19, 1931, which said application is threatened with conflict with an application Serial No. 400,558 Egbert R. Williams, pursuant to a letter from the Commissioner of Patents dated March 17, 1934, do hereby severally solemnly and conscientiously declare and say:—

1. That we first conceived the idea of pressing practically dry calcium hydroxide powder into a shaped body and thereupon subjecting the shaped bodies thus obtained to the action of carbon to form calcium carbide, on March 30, 1926.

2. That we first pressed in a laboratory scale practically dry calcium hydroxide powder into a shaped body and first made written notes thereof on the same date.

3. That we first made written notes of the idea of subjecting the said shaped bodies to the action of carbon to form calcium carbide on April 17, 1926, by recording the analysis showing that practically dry calcium hydroxide powder being the waste product of acetylene gas manufacture is free from impurities which would prevent it from being used, in the form of shaped bodies, in the carbide furnace.

4. That we first disclosed the idea of pressing practically dry calcium hydroxide powder into a shaped body to "Zeitzer Eisengiesserei und Maschinenbau Aktiengesellschaft, Zeitz" (Germany) in June, 1926.

5. The dates and nature of the subsequent steps taken by us to develop and perfect the said invention were as follows:—

(*a*) In June, 1926, we sent a barrel containing practically dry calcium hydroxide powder being the waste product of acetylene gas manufacture to "Zeitzer Eisengiesserei und Maschinenbau Aktiengesellschaft, Zeitz" asking them to press the said calcium hydroxide powder in a technical scale in June, 1926.

(*b*) From November, 1926, to March, 1927, we pressed about 350 tons (German tons) of practically dry calcium hydroxide powder into shaped bodies part of which has been used in the carbide furnace on March 10 to 16, 1927.

Patents for Winter's alleged invention were applied for and obtained in many European countries, that in Germany issued in May, 1931, and that in France having been granted on May 19, 1931. It will be seen therefor that patents were granted to Winter more than two years prior to the filing of the application of Williams, which would be a bar to a patent issuing to Williams in Canada.

At this stage reference perhaps would be made to the fact that an application for a patent for a "Method of Making Calcium Oxide in Lump Form," was made by one Kaufman, in October, 1932; Kaufman's application was made at the instance of the defendant, in whose employ, I think, he was at the time; and the application of Kaufman was, I think, assigned to the defendant but this is perhaps not clear. Certain claims in the application of Kaufman were declared to be in conflict with those of Winter. In an affidavit filed with the Commis-

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sioner of Patents, pursuant to sec. 22 (2) of the Patent Act, Kaufman placed the date of his invention to be in the early part of August, 1929. Kaufman essentially claimed the same thing as Winter; in the end the Commissioner of Patents awarded priority to Winter in respect of the claims which were in conflict, and Kaufman's application apparently was then abandoned.

Thereupon there followed, in June, 1933, the application of Williams, who was then also in the service of the defendant, and this application was made apparently at the instance and with the knowledge of the defendant. While Kaufman is no longer before us, yet the plaintiff's counsel comments upon the fact that the defendant having promoted the application of Kaufman, and that having been refused as against Winter, it then promoted the application of Williams which is substantially the same as Kaufman, except that the former claims a date of invention much earlier than that of Winter, in fact it goes back as far as 1916. It is quite apparent, I think, that the application of Williams was made because priority had been awarded to Winter as to date of invention as between Winter and Kaufman, and it was expected, through Williams, to establish a date of invention earlier than that of Winter. We may now turn to a consideration of the application of Williams which is here in conflict with Winter.

I do not think it is necessary to quote from the specification of Williams because in so far as the invention there described and claimed is in conflict with Winter, it may be regarded, for our purposes here, as being the same invention as that claimed by Winter. As already mentioned the application of Williams for a patent has been abandoned, and it is now contended on behalf of the defendant that the claims of Winter should be refused because, *inter alia,* Williams, at a date anterior to Winter, had conceived and put into use the method of producing the same product for which Winter claims invention and a monopoly; the defendant now also claims that in any event there is no invention in Winter, and that the same was anticipated by the prior art. It becomes necessary therefore to inquire what it was Williams conceived or practised in this particular art prior to Winter's alleged date of invention, and which at this stage in the application of Winter would

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justify the Commissioner of Patents in refusing the same; this, I think, may be done without particular reference to the specification of Williams.

We may first turn our attention to the affidavit of Williams, dated May 14, 1934, and deposited with the Commissioner of Patents pursuant to sec. 22 (2) of the Patent Act, and after certain of the claims of Winter and Williams were declared to be in conflict. That affidavit is as follows:

I, the undersigned, Egbert R. Williams, of the City of Shawinigan Falls, in the Province of Quebec, and Dominion of Canada, being sworn, depose and say:—

(1) That I am that Egbert R. Williams whose application for Letters Patent for Process of Making Calcium Carbide was filed in the Canadian Patent Office the 27th day of June, 1933, under Serial Number 400,558.

(2) That, at a date prior to July, 1916, I conceived the invention set forth in my said application, being essentially the briquetting of pulverulent calcium hydrate (obtained as a waste product from the manufacture of acetylene gas by slaking calcium carbide with water), calcining the briquettes and employing the calcined briquettes as a furnace charge in the manufacture of calcium carbide.

(3) That I made verbal disclosure of my said invention to others, including the late J. C. King, who was at that time an executive officer of Canada Carbide Company, Limited.

(4) That, on the instructions of the late Mr. J. C. King, a series of tests were conducted at McGill University, Montreal, to determine the feasibility of briquetting and calcining the calcium hydrate waste for re-use in a carbide furnace, a report of which tests was rendered by the university under date of July 16, 1916.

(5) That the earliest written descriptions of my said invention have been mislaid or destroyed.

(6) That, in the year 1920, mechanical equipment suitable for semi-plant scale tests was obtained and that, between July 22, 1920, and November, 1921, I conducted at the plant of Canada Carbide Company, Limited, Shawinigan Falls, a long series of experiments in the briquetting of calcium hydrate waste from acetylene gas manufacture and the calcining of the briquettes.

(7) That, in the months of December, 1920, and January, 1921, I designed the necessary equipment for carrying out my invention on a commercial scale.

(8) That, on the 24th November, 1921, one of the carbide furnaces of Canada Carbide Company, Limited, at Shawinigan Falls, was operated for a period of approximately twelve hours, during which approximately thirteen tons of briquettes according to my invention were used as part of the furnace charge. The calcium carbide produced was of satisfactory quality and a higher than usual yield of carbide per unit of energy consumed was obtained. The results of this experiment indicated the desirability of improvement.

(9) That memoranda of the foregoing tests are found in the records of Canada Carbide Company, Limited.

(10) That, from the 24th November, 1921, to the month of May, 1930, experimental work was carried on at the plant of Canada Carbide

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Company, Limited, directed chiefly to perfecting the briquetting and calcining practice, but including the fusing of a number of small lots of calcium oxide briquettes with carbon in an electric furnace, with production of good grades of calcium carbide.

(11) That, from the month of May, 1930, until the month of May, 1931, approximately two hundred tons of calcium oxide briquettes were produced according to my said invention and that these briquettes were accumulated and fused with carbon in a large electric furnace as a plant size operation, commencing on or about the 19th May, 1931, and finishing on or about the 22nd May, 1931, and produced a good grade of calcium carbide.

(12) That, as a result of the test of May, 1931, it was decided the invention had advanced to a practical conclusion and machinery was installed for the manufacture of calcium oxide briquettes according to my said invention on a commercial scale.

From this affidavit it will be observed that Williams claims to have conceived his invention prior to July, 1916, and that in 1920 and 1921 he, experimentally, briquetted calcium hydrate waste from acetylene gas manufacture and the calcining of the briquettes. The last three paragraphs of the affidavit would rather indicate that Williams' experimental work was not concluded till May, 1931.

I am inclined to think that anything alleged to have been done by Williams prior to 1920 must be regarded as inconclusive experimental work. We may direct our attention next to certain correspondence passing between the defendant and various manufacturers of machines designed for the briquetting of such material as the waste product derived from the manufacture of acetylene gas, in order to ascertain, if possible, the stage of development reached by Williams, in the years 1920 and 1921, in respect of the problem then engaging his attention, the problem which he claims to have solved at least earlier than Winter. I should perhaps observe that prior to 1917 Williams was in the employ of the Canada Carbide Company, Ltd., at Shawinigan Falls; in 1917 he went overseas with the military forces of Canada, and in 1920 he returned to the company, the predecessor of the defendant company.

In 1920, Williams began a series of letters directed to the manufacturers of briquetting machinery and hydraulic presses; these letters were written by Williams on behalf of his employer, then The Canada Carbide Co. Ltd. In July, 1920, he wrote The Chas. F. Elmes Engineering Works, of Chicago, as follows:

We have been working on the problem of agglomerating a partially dehydrated Lime Sludge.

Experimental work on briquetting, using an improvised press, has shown very promising results.

We would like to enlist your aid and experimental facilities to help us in this work.

A sample of the material is going forward to-day. Will you please examine this and bear in mind that about 75 tons are to be agglomerated per day?

Perhaps some of your machines are adapted to this work and if so could we have some preliminary work and later a commercial scale test carried out?

Your comments and descriptive literature would be appreciated.

A letter to the American Process Company, of New York, in August, 1920, is partly as follows:

We are sending you under separate cover a sample of dehydrated lime sludge just as it leaves our filter. In this condition the sludge contains about 30 to 40% Ca 0 and 60 to 70% free and combined water.

We wish to dehydrate this material as thoroughly as possible by mechanical means before any attempt is made to use a drier.

In a letter addressed to Smidth & Co. of New York, dated August 16, 1920, he writes: "You are right in presuming that a powdery lime would be a useless product for our purposes." This would rather indicate that Williams did not then have in mind that a dry powder lime was capable of being made into a briquette that could be used in a carbide furnace; in the same letter he suggests that "to enable you to form solid strong agglomerates we would suggest the addition of up to 5 per cent Fluor Spar or up to 3 per cent calcium chloride." Then, in another letter written by Williams to Smidth & Co., dated September 16, 1920, he states that two drums (about 150 pounds) of Lime Sludge had been shipped, and the second paragraph of that letter states:

Only two probable agents suggest themselves to us, which might strengthen the clinker. These are, Calcium Chloride of Fluor Spar. Silica and Magnesia are certainly unsuitable from the furnace standpoint.

It is apparent from these two letters that what Williams had in contemplation was a briquette with a binder of some kind.

In a letter of November 17, 1920, from the F. J. Stokes Machine Company, Philadelphia, to whom had been sent a quantity of sludge, that company in reply states:

The moisture content of this material is not carried very low as the dry material will not briquette.

This would indicate that this company was also of the opinion that a dry powdered lime could not be briquetted.

Then Williams made two written reports to his principal which should be considered. On November 24, 1921, in a

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report on the ultilization of lime sludge as a briquetted furnace charge, Williams states:

In order to test the idea of briquetting our gas plant sludge with fine coke or coal a large number of tests were made with a view to finding a suitable bonding agent and a working process for the recovery of the values now being disposed of into the flat below the Magnesium Plant.

With a small improvised hand press briquettes were made using pure sludge and sludge with additions of coke, pitch, gas coal and water.

None of these mixtures gave promise of holding together unless subjected to a careful baking after pressing and drying.

Various bonds were used to avoid the baking step if possible. Those tried included salt, calcium chloride, sugar, magnesium chloride, starch, dextrine, tar and pitch. Attention was only paid to additions of small quantities of bond as large proportions would have precluded the possibility of a commercial process.

In all cases it was found that the briquettes became soft or crumbled on preliminary heating. This meant that in the furnace operation they would disintegrate and seriously interfere with furnace operation.

Therefore the work of making a live hydrate brick was discontinued and attention paid to the more promising "coked" brick of sludge, coke and pitch.

Fresh gas plant sludge was dried to about 10% of free water. This powdered material was then mixed with fine coke and pitch, this material pressed into very strong briquettes which were coked by heating to about 600-700° C in an iron box covered with sand.

The mechanical qualities of these bricks after baking were satisfactory.

It is evident from this report that Williams then had in mind only the use of a binder with a wet sludge.

Some five years later, on February 16, 1926, while still engaged in the problem, Williams directed a report to the Vice-President and General Manager of the Canada Carbide Company Limited, in regard to the utilization of carbide sludge, and therein he states:

Of the various proposals made for the reclaiming of the lime value of our sludge, three, at least, have shown great promise.

In view of the increasing value and tonnage of sludge produced, it seems advisable to protect ourselves by patents in Canada and the U.S.A.

Briefly, the three lines of experimental work have had for their goal the agglomeration of the sludge into suitable solid masses, mechanically strong enough to stand charging into the carbide furnaces. This means that the lime recovered from the sludge would be returned to the furnaces in such condition that calcium carbide would be again formed and only the lime necessary to make up losses would be added to the process.

The first scheme is to classify, filter and partially dry the sludge to about 10% free water content. This almost dry powder is then mixed with from 15% to 30% of pitch, with or without coke or coal screenings, the mixture pulverized and briquetted in any standard type of press. These briquettes are allowed to air-dry and set hard, or may be calcined at such a temperature that the lime-hydrate is decomposed, leaving only lime and coke, or the air-hardened briquettes may be fed directly into the carbide furnaces.

During 1920 and 1921, we made about 40 tons of this type of briquette and calcined them at the plant of the Can. Electrode Co. The result of this trial proved the practicability of the scheme and only the large capital outlay necessary prevented our putting in a plant at that time.

Another line of experimental work was also followed. This was the mixing of partly-dried sludge with coke fines, Welsh anthracite Buckwheat and pitch and tar. The mixture was then coked in a reducing atmosphere to produce an agglomerate, which while considerably less strong and dense than the briquettes, yet gave a satisfactory product for furnacing.

The third method which promises to give us a fair recovery of our lime sludge is to mix with the sludge sufficient coking coal to give a mass dry enough to be charged into a standard coke retort of any type. The product obtained by low temperature coking is quite strong enough for our work here. However a very large proportion of coal (2 to 4 parts of coal to 1 of sludge) must be used, so that the coked product by itself is not suitable for the carbide manufacture. It is necessary to add considerable lime to the charge along with the sludge agglomerate.

Any one of these proposals if acted upon will enable us to recover about 90% of the sludge which is at present going to waste.

As long as we are "bleeding-out" of the system about 40% of our daily production, there is little danger of the lime impurities "building-up" to serious proportions.

It will be observed from this report that while Williams had in mind drying the sludge so that it would have only about 10 per cent free water content, he yet had in mind mixing with this dry powdered lime 15 to 30 per cent of pitch as a binder, with or without coke or coal screenings. It is therefore evident, I think, that on February 16, 1926, Williams did not know, or had not demonstrated, that powdered calcium hydroxide, or calcium oxide, could be briquetted, without a binder, with sufficient resistance or strength so as to be successfully utilized in a carbide furnace, which was what Winter discovered in 1926, and for which he now claims invention.

The foregoing correspondence and the written reports of Williams to his principal, fail to establish in my opinion that prior to March 30, 1926, Williams had conceived and demonstrated that practically dry powdered calcium hydroxide, or calcium oxide, or both, could be briquetted so as to be practically useful in a carbide furnace for the production of calcium carbide.

Now upon the facts disclosed, and considering the abandonment by the defendant of any claim to a patent, what is the proper disposition to be made of this matter? It is conceded that Williams is not entitled to a patent, and Mr. Gowling stated he had no objection, as between the plaintiff and defendant, to a patent issuing to the plaintiff providing the claims were limited to the product made by

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briquetting practically dry material only, and not from material containing a substantial percentage of moisture; it was suggested that the product now made by the defendant is not made of practically dry material, but of a material which contains a considerable percentage of moisture. Had the defendant earlier advised the Commissioner of Patents, that Williams' application was abandoned, I think it may be fairly assumed that he would have allowed the plaintiff's application, and he would not have declared the claims of the respective applicants to be in conflict; in fact there could not in that case have been any conflict. Therefore, Williams being no longer an applicant for a patent, and there now being no conflict in the claims of rival applicants to consider, and the Commissioner of Patents being of the opinion that he would have allowed Winter's application had there been no conflict, it would seem that the proper disposition of the matter now is to declare that the plaintiff is entitled to a patent, or, that the matter should be referred back to the Commissioner of Patents to dispose of as he saw fit, there being no longer any claims in conflict. Possibly I should have directed this proceeding to be remitted to the Commissioner immediately it was conceded that the defendant was not entitled to a patent.

When one comes to analyse carefully sec. 22 of the Patent Act it does not seem to be quite clear just what one is called upon to decide. As between the plaintiff and the defendant it is my opinion that the plaintiff is entitled to a patent and I would so decide even if the defendant had not disclaimed any right to a patent; beyond that I do not think I am required to go for the present, and I am not of course deciding whether or not the defendant is infringing the alleged invention described by Winter. The true construction of Winter's specification may possibly involve some difficulties, but that will have to be disposed of when and if the question arises. I should perhaps observe that none of the prior art cited seem to me to be relevant here. The exact formulation of the claims in Winter's application may be left to the Patent Office, but of course, they must be limited precisely to what is described in the specification. The plaintiff is entitled to its costs of this proceeding.

Judgment accordingly.