BETWEEN:

CANADIAN INDUSTRIES LTD. AND CANADIAN GENERAL ELECTRIC COMPANY .... PLAINTIFFS,

AND

THE SHERWIN-WILLIAMS CO. OF CANADA, LIMITED .... DEFENDANT.

1942
Sept. 22 to 25; 28 to 30
Oct. 1 to 3; 5 to 9; 26 to 30
Nov. 2 to 6; 9; 11 to 13; 16 to 20
1945
Oct. 5

Patents—Invention—Subject matter—Anticipation—Lack of invention—First inventor—Lack of obviousness is not sufficient to establish invention—Evidence of invention—Patent Act 25-26 Geo. V. c. 32, s. 61.

The action is for infringement of Canadian patent No. 292,354 for improvements in resinous condensation products granted Canadian General Electric Company, assignee of Roy H. Kienle, the inventor, on August 20, 1929. The Court found Plaintiffs' patent invalid for lack of invention and also on the ground of anticipation.

Held: That mere lack of obviousness is not sufficient to establish invention, there must be inventive ingenuity.

2. That mere conception is not invention, the conception must be followed by reduction to practice.

3. That first inventor within the meaning of the Patent Act means not the first discoverer of the thing or the first to conceive it but means the first to publish it.

ACTION by the Plaintiffs to have it declared that, as between the parties, patent for invention No. 292,354 is valid and has been infringed by the defendant.

The action was tried before the Honourable Mr. Justice Angers, at Ottawa.

W. F. Chipman, K.C., H. Gérin-Lajoie, K.C. and *H. Hansard, K.C.* for plaintiffs.

R. S. Smart, K.C., Erskine Buchanan, K.C. and *Christopher Robinson* for defendant.

The facts and questions of law raised are stated in the reasons for judgment.

ANGERS J. now (October 5, 1945) delivered the following judgment:

This is an action for infringement of a patent, No. 292,354, granted to Canadian General Electric Company, assignee of Roy H. Kienle, the inventor, on August 20, 1929, pursuant to an application filed on April 4, 1927.

A copy of the specification was produced as exhibit 1.

The invention relates to alleged new and useful improvements in resinous condensation products.

The statement of claim, after stating that Canadian Industries Limited, Canadian General Electric Company and The Sherwin-Williams Company of Canada, Limited are all three bodies politic and corporate, the first and third ones having their principal places of business in the city of Montreal, province of Quebec, and the second one having its principal place of business in the city of Toronto, province of Ontario, alleges in substance:

> The plaintiff, Canadian General Electric Company, is the owner of the letters patent above mentioned issued to Roy H. Kienle as the inventor, whereby he was granted the exclusive right and privilege, for a term of eighteen years from the date of the letters patent, of making, constructing and using, and vending to others to be used, the said invention;
>
> The plaintiff, Canadian Industries Limited, is a licensee, and in certain fields an exclusive licensee, under the above letters patent and the claims thereunder;
>
> The defendant has infringed the rights of plaintiffs under said letters patent as set out in the particulars of breaches and threatens to continue said infringements.

In their particulars of breaches, plaintiffs aver:

> The defendant has infringed the rights of plaintiffs under patent No. 292,354 by the manufacture and use and the sale and offering for sale, in the city of Montreal and elsewhere in Canada, of alkyd resins and paints and varnishes containing them which infringe the said patent over a period commencing some time before January 1, 1937, up to the present date (June 26, 1939);
>
> The precise number and dates of defendant's infringements are at present unknown to plaintiffs;
>
> The plaintiffs will rely on claims 3 and 4 of the patent.

Further particulars of breaches were given in compliance with an order of the Court as follows:

> The alkyd resins and paints and varnishes containing them, referred to in the particulars of breaches filed and served with the statement of claim herein, are those which are designated and known as Fleet-X Kem Finishes, Air-Drying Kem Enamels and Exterior Kem Enamels.

In its statement of defence, the defendant admits the allegations of the statement of claim concerning the status of the plaintiff and defendant companies, admits that Canadian General Electric Company is the owner of the patent referred to in the statement of claim, but denies that Roy H. Kienle is the inventor or that any invention is described in the letters patent, says that it has no knowledge that Canadian Industries Limited is a licensee, denies having infringed the letters patent, avers that the letters patent are and always have been invalid for the reason set forth in the particulars of objection delivered on behalf of defendant and submits that the action should be dismissed with costs.

The particulars of objection amended pursuant to the orders of December 12, 1939, and December 4, 1941, allege:

> There was no invention having regard to the common knowledge of the art and to the patents and publications set forth in Schedules I and II;
>
> The alleged invention was not new; it was known and used by others before the date thereof as appears from the common knowledge in the art at the date the said invention is alleged to have been made and from the patents set forth in Schedule II and the applications therefor;
>
> The claims of the letters patent claim more than the applicant invented, if he invented anything, inasmuch as they refer to any polyhydric alcohol and to any polybasic acid and to any mixed fatty acids derived from a drying oil, whereas only particular alcohols, acids, polybasic acids and fatty acids are disclosed in the specification as useful in the process there described;
>
> The alleged invention described in the letters patent was abandoned by the inventor or his assignee many years before the date of application for the letters patent in Canada; under this paragraph the defendant will rely upon: (*a*) the fact that neither the alleged inventor Kienle nor his assignee, General Electric Company, took any steps towards patenting the alleged invention but allowed it to lie dormant and abandoned for a number of years; (*b*) the further fact that General Electric Company and the plaintiff Canadian General Electric Company elected to obtain Canadian patent No. 292,353, and United States patent No. 1,803,174 as an alleged invention of a chemist named Dawson, which was intended to cover any useful work done in relation to alkyd resins, and the said General Electric Company and Canadian General Electric Company, by filing and prosecuting the applications for the aforesaid patents as an invention of the said Dawson, abandoned any claim that could be made for any related invention made by Kienle;
>
> The specification of the said letters patent describes an inoperative process; it would not be possible by following the processes of the examples set forth in the specification to obtain the products described;
>
> The invention described in the letters patent is not useful; it would not be possible by following the directions contained therein to obtain any useful product; the directions of the specification indicate the use of

any cyclic polybasic acid in association with any unsaturated, oxidizable acid, whereas many aromatic cyclic polybasic acids and many unsaturated oxidizable acids when used in the process do not produce a useful result;

The specification forming part of the letters patent is ambiguous and insufficient inasmuch as it states that any polybasic acid may be used in the reaction, whereas many polybasic acids cannot be used in the way described and would be useless for the purposes set forth in the specification;

Claim 3 of the letters patent is wider than the invention and the composition defined thereby is old in the art set forth in Schedule I; this claim refers generally to an oxidizable, unsaturated fatty acid and would include acids not dervied from a drying oil;

Claim 4 of the letters patent is wider than the alleged invention described in the specification in so far as it refers to any polyhydric alcohol and to any polybasic acid, whereas many polyhydric alcohols and polybasic acids are not useful for the purposes of the alleged invention;

The alleged invention defined by the claims of the patent was previously patented by the plaintiff, Canadian General Electric Company, by the issue of Canadian patent No. 262,979 on July 27, 1926, filed August 1, 1925, and the Commissioner is therefore without authority to grant the letters patent referred to in the statement of claim;

The invention defined in the claims of the patent upon a proper construction is anticipated by the prior patents, applications and publications referred to in Schedules I and II.

Schedules I and II mentioned in the particulars of objection are made up as follows:

SCHEDULE I

UNITED STATES PATENTS

Number	*Patentee*	*Date*
335,485	Schaal	Feb. 2, 1886
1,098,728	Howell	June 2, 1914
1,098,776	Arsem	June 2, 1914
1,098,777	Arsem	June 2, 1914
1,119,592	Friedburg	Dec. 1, 1914
1,141,944	Dawson, Jr.	June 8, 1915
1,214,611	Terrisse	Feb. 6, 1917
1,422,861	Hocker	July 18, 1922
Re 16,240	Hocker	Jan. 5, 1926

CANADIAN PATENT

223,007	Hocker	Aug. 22, 1922

BRITISH PATENT

25,727	Lake	1898

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PUBLICATIONS

"The Manufacture of Varnishes and Kindred Industries" by Libache & McIntosh, London, Scott Greenwood & Son, p. 28.

"The Manufacture of Varnishes and Kindred Industries" by John Geddes McIntosh, London, Scott Greenwood & Son, 1911, pp. 376 to 379 inclusive.

"Varnishes and Their Components" by Robert Selby Morrell, London, Henry Frowde and Hodder & Stoughton, 1923, pp. 30 and 31.

"Synthetic Resins and Their Plastics" by Carleton Ellis, 1923, published by The Chemical Catalog Company, Inc., New York, pp. 147, 148, 149 and 293.

Journal of the Society of Chemical Industries, Article by Watson Smith entitled "A New Glycerole Phthalate", pp. 1075 and 1076.

SCHEDULE II

UNITED STATES PATENTS

Number	*Patentee*	*Issue Date*	*Filing Date*
1,690,515	Weber	Nov. 6, 1928	Oct. 13, 1925
1,773,974	Ellis	Aug. 26, 1930	Sept. 23, 1926
1,803,174	Dawson	April 28, 1931	May 23, 1925
1,843,869	Ellis	Feb. 2, 1932	April 26, 1924
1,893,874	Adams	Jan. 10, 1933	June 25, 1926
1,927,086	Ellis	Sept. 19, 1933	Mar. 13, 1926
1,958,614	Ellis	May 15, 1934	Oct. 10, 1925
1,974,742	Hopkins & McDermott	Sept. 25, 1934	Aug. 14, 1926

CANADIAN PATENTS

223,007	Hocker	Aug. 22, 1922	May 23, 1921
262,979	Adams	July 27, 1926	Aug. 1, 1925
292,353	Dawson, Jr.	Aug. 20, 1929	April 4, 1927
311,488	Hopkins & McDermott	May 19, 1931	Oct. 29, 1929
311,690	Weber	May 26, 1931	Oct. 15, 1928
329,631	Ellis	Jan. 24, 1933	June 8, 1931
351,517	Hopkins & McDermott	July 9, 1935	July 25, 1931

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The patentee, in his specification, says that his invention relates to artificial resins of the condensed ester type and comprises an improved resinous composition which contains in a combined state oxidizable, unsaturated fatty acid, for example, such acids as may be derived from drying oils.

The object of the invention is described as follows:

> It is the object of my invention to produce resins of the polyhydric alcohol-polybasic acid class, which can be fully hardened or set at ordinary room temperatures, that is, without baking, which shall have greater hardness and elasticity and in general have more advantageous physical properties for industrial purposes than resins of this class which have been produced heretofore.

The patentee refers to the United States patent No. 1,098,776 relating to resins and says:

> Arsem U.S. patent 1.098,776 of June 2, 1914, describes the preparation of resins from a polyhydric alcohol, such as glycerine, and a cyclic polybasic acid such as phthalic acid together with an aliphatic acid. Included among the aliphatic acids are fatty acids, such as stearic or oleic acids. These fatty acids are of the non-drying type, that is, they are not hardened by oxidation.

The patentee then proceeds to describe in general terms his discovery and states:

> I have discovered that when an aromatic or cyclic polybasic acid, such as phthalic acid, is associated with an unsaturated, oxidizable acid, namely an acid derived from a drying oil, such, for example, as eleostearic, linolic, or linolenic acid, that then a new form of resinous material is produced which differs in many important respects from the resin containing a non-drying fatty acid. For example, such a resin is soluble at ordiary temperatures in a drying oil. The resin containing such acid is convertible by contact with the air at ordinary temperatures to a hard, tough state. When applied in solution on metal or other foundation material a tough, flexible and tenaciously adherent film is formed upon evaporation of the solvent and air drying. All these properties render this resin valuable as an ingredient in varnishes or other protective coatings.

The specification then gives two specific examples to ilustrate the manner of carrying out the invention and the character of the products derived therefrom. They are worded thus:

> First example: About 92 parts by weight of glycerine and 296 parts by weight of phthalic anhydride are heated with the temperature gradually rising. At about 160° C. a clear, straw-coloured solution is produced. The temperature is gradually increased to about 200° C. to cause a reaction to proceed, water vapor and some anhydride being given off. At this point an additional quantity of phthalic anhydride may be added—say about 74 parts by weight, and also about 140 parts of one or more fatty acids derived from a drying oil, such as chinawood, linseed, or perilla oil. Heating is continued at a temperature within the range of 190° C. to 210° C. until frothing and the giving off

of vapors ceases and a clear liquid is formed. Instead of the mixed acids derived from a drying oil, which include also as minor constituents non-oxidizable fatty acids, I may use one or more oxidizable, unsaturated acids, such as eleostearic, linolic or linolenic acids unassociated with other fatty acids.

Second example: The cyclic or aromatic acid may be mixed with the aliphatic acid and reaction then may be carried out in one stage by the addition of glycerine. By weight, about 370 parts of phthalic anhydride and about 140 parts of the fatty acids derived from one of the drying oils are melted by heating to about 160° C. About 92 parts of glycerine then are added and the temperature is raised to about 200° C. until resinfication occurs. I prefer to heat the mixture until a resin is formed which strings out at about 180° C. when allowed to fall in drops.

Then follows the concluding statement which reads as follows:

A resin prepared by either method is more flexible and tougher than a resin derived from glycerine and phthalic anhydride alone, unassociated with the acid derived from a drying oil.

The specification then continues thus:

The resins made in accordance with my invention are soluble in acetone, alcohol-benzol, coal tar oil, acetone oil, butyl acetate, butyl alcohol, ethyl lactate, glycol diacetate, glycol, glycol derivatives such as the non-ethyl ether, benzyl acetate, phthalate esters such as diethyl phthalate, triacetin.

When such resin dissolved in a suitable solvent of the types mentioned above is applied as a varnish film, a tough tenaciously adherent film is produced upon evaporation of the solvent and air drying of the resin. Such a film is particularly advantageous for coating metals because of its adherence.

The patentee then declares that the resin may be utilized in massive or bulk form, for example, by casting the fused resin into suitable moulds to produce slabs, sheets or ingots, and that it may also be used in conjunction with various filler for the preparation of moulded products, or as a cement or a binder for laminated materials, or as an impregnant for porous materials.

The patentee concludes thus:

The resins made in accordance with my invention are miscible directly by simple heating with drying oils, such as linseed oil, chinawood oil, perilla oil, or blown fish oil. Such solutions are useful as a varnish for coating metals, wood or other articles.

The plaintiffs rely upon claims 3 and 4, which I deem apposite to quote here:

3. A resinous composition constituted by the condensation product of glycerine, phthalic anhydride and an oxidizable, unsaturated fatty acid.

4. A resin constituted by the reaction product of polyhydric alcohol, a polybasic acid and the mixed fatty acids derived from a drying oil.

The first question to determine is that of the validity or invalidity of the patent. The particulars of objections raise lack of invention and anticipation.

The alleged lack of invention is based on the patents and publications set forth in Schedules I and II hereinabove reproduced and the common knowledge of the art.

The preparation of paints and varnishes always depended on the selection and mixture of a variety of ingredients, such as resins, natural or synthetic, oils and acids, not to say anything of colours which are immaterial in the present case.

Various proportions are used and diverse ingredients are substituted for one another from time to time. As may be expected, as different materials vary in their availability or their price, they are replaced. An example of this is the case of the chinawood oil or tung oil, which appeared shortly after 1900 and made a notable improvement in the varnishes and coating compositions. Yet I do not think that it could be seriously contended that one could get a patent for using this oil, notwithstanding that there may have been considerable advantages in its use.

The properties of all the oils referred to have been long known in this art. Linseed oil, with which we are almost principally concerned, has been used in coating purposes from almost time immemorial, due to the fact that it will dry. By itself it does not dry very quickly; it may run up to a month before it dries. When mixed with a pigment such as zinc oxide for instance, it dries in a much shorter time.

Drying properties in themselves are not new in the paint and varnish art. Paint and varnish of course would be of no utility unless it dried.

Synthetic resins are comparatively new in the protective coating composition art. No one had anything to do with them before 1900 and no one used them before 1910. Natural resins on the other hand have been used for a very long time, in fact ever since man began to think of that problem.

I may note incidentally that natural resins are the exudations from plants or insects. The most widely known are the shellac, which is lac melted and run into thin plates, and the viscid secretion from the pine tree. Natural resins alone lack a number of characteristics for coating compositions but, when associated with oils, constitute a very passable protective composition. The natural resins possessed such characteristics as hardness and adherence. The oil supplied the film forming feature. The result of the combination was a varnish.

The natural resins divide themselves into soft on the one hand and hard on the other. The division is sometimes expressed thus: those that are completely soluble in an organic liquid, whether spirit or oil, and those partially or completely insoluble. The latter are usually rendered soluble by what is called cracking, i.e., heating. A few words about the principal natural resins may be convenient.

The spirit varnish, without oil, is merely a natural resin dissolved in a volatile solvent. When that material is spread on a surface the solvent evaporates and, if there is no oil added in it, nothing is left but the original resin. As already stated one of the chief spirit varnishes is shellac. Shellac is not an ideal coating as it does not stand weathering but whitens easily, particularly under effect of water.

Rosin is the exudation from the oleo-resin of pines and trees of that class after the separation from the turpentine. Rosin, if there is a large quantity of it in an oil varnish, gives a brilliant finish, but it is subject to the same criticism as shellac, as it easily whitens. Moreover the film is brittle and friable and subject to destructive oxidation. Mr. Chipman intimated that while rosin may be added to other resins and increase their solubility in oils it is usual to say that the rosin content is a measure of cheapness and indicative of a lack of desirable characteristics for a good varnish.

Counsel alluded briefly to ester gum, saying that it contains a quantity of abietic acid and that to offset this high acidity the resin can be treated with glycerol and that the result of this treatment is called an ester gum, which, like the original resin, is soluble in oils and can make a varnish. The result is not known in the art as a synthetic resin because the components are already resinous.

In addition to the natural resins and the ester gum previously referred to, there are the oil varnish natural resins, including copals known as congo and kauri. The copals are unsuitable for resin use due to their insolubility in varnish oils. They can be made suitable however by heating, called in the art cracking or running. This cracking or running, in order to make the copals soluble, is not considered as making it a synthetic resin.

To sum up, I may note that the natural resins may be divided into spirit varnish resins, oil varnish resins and natural resins which have been treated in such a way as to be useful in the art and say that where they have been esterfied, as in the case of rosin, or cracked or run, as in the case of copal, they are still natural resins and not synthetic resins.

Generally speaking, varnishes are prepared by heating together, in suitable proportions, one or more soluble resins and one or more oils. The product must be thinned in order to be useful. When it is sufficiently thinned to facilitate its application to a surface, it may be used as a coating varnish. This may dry after standing in the air a certain time and drying will harden it. The hardening involves more than the mere evaporation of the volatile solvent and the consequent setting; there must be some chemical action between the oil and the air so as to change in some way the characteristics of the film. There is no perfect theory of hardening unanimously accepted, but it is admitted in hardening there is absorption of oxygen. So the action of hardening is commonly called oxidation.

Apart from hardening in the air there is hardening by the application of heat; generally speaking, the higher the temperature, the shorter the time for the hardening. The term usually employed in the art for heating in the case of a varnish is baking. Baking a varnish is submitting it to excessive temperatures of 250° F. or over. It is a form of accelerated drying.

It was known for years that one could vary the quality and property of the varnish oils, not only with regard to the ingredients that went into them, i.e., the particular fatty oil and particular resin used, but also as to the proportions between the two; hence arose the terms a long oil or a short oil varnish. The long oil varnish, in which there was a larger proportion of oil, would not dry as quickly, but there would be more of the qualities of the oil than of the resin in the composition; it would be durable, tough, not brittle. The short oil varnish, in which the proportion of oil is low, would dry more quickly; it would not have the same wearing qualities as the long oil varnish but it would have the fast drying property. That was one of the problems with the natural varnishes.

Dealing now with the synthetic resins, I may say that the first of these resins are the class of phenolic resins, composed of phenol formaldehyde. I may perhaps point out that the ingredients of this synthetic resin are distinct from the ingredients of the resin covered by the patent in suit, which has to do with a synthesis of an acid and an alcohol.

In 1910 a synthetic resin composed of phenol formaldehyde heated with copal, the two together forming a material soluble in oils and therefore usable as a varnish resin, appeared on the market. These resins were called albertols; they had to be combined with oils before they could be useful as a varnish. They were not complete resins in themselves and only became usable as a varnish to cover a surface after being combined with oils. Dissolving the albertols in a volatile solvent, spreading the solution on the surface and letting the solvent evaporate will not give a practical film. In order to give it forming quality one has to add linseed oil or some similar ingredient.

In 1914 some phenolic resins were made completely soluble in varnish oils. They had however to be made with a suitable oil into a whole for a commercial resin. From that point of view the fact that this synthetic resin must be used with an oil creates some analogy between the phenols and the natural resins.

A word may be said about the oleo-resinous varnishes. Usually that phrase is restricted to oil varnishes in which a natural resin is and must be mingled with an oil in order to make a finish.

The next class of synthetic resins is that of the cumarone resin. This resin is formed by the union of cumarone and indene occurring in coal-car distillation products. It is, properly speaking, a synthetic resin because neither of the constituents is resinous. I may note that it is distinguishable from the synthetic resin in suit, seeing it is not a resin of the acid alcohol type at all.

Another branch of the varnish art, to wit the nitrocellulose coatings, must also be mentioned. Nitrocellulose coatings are known as lacquers because they are comparable with shellac in this sense that after they have been spread they dry by evaporation. The nitrocellulose supplies the film-forming characteristic of the varnish. It is not adhesive and is brittle. The resins are added in order to procure adhesion; the plasticisers are added to give the film flexibility. Nitrocellulose solutions were long known as coverings for metals.

Even a small percentage of nitrocellulose in a solid gives such viscosity as to prevent application or at least reduce its possibility. In order to get the possibility of making coats of varnish including nitrocellulose, the percentage of the latter in each spreading had to be so small that one had to have a large number of coats before getting sufficient thickness. The drawback in this connection is known as high viscosity and until the problem of high viscosity of nitrocellulose was solved nitrocellulose could not come into common use as a protective coating.

In or about 1921 an employee of the Dupont Company discovered a method of producing nitrocellulose of low viscosity, yet having good film-forming properties. The product after spreading can be said to have air dried in the sense that the cells formed a hard film irrespective of the contents of the cells. Nitrocellulose began a career of its own in the varnish art in 1923-1924. The industry was captivated by this new coating; all methods of coating were reorganized so that, whereas in 1923 about 1 per cent. of all the automobiles manufactured in the United States were finished with nitrocellulose lacquers, by 1927 over 95 per cent. were so finished.

Around 1901 a chemist named Watson Smith tried reacting glycerol and phthalic anhydride. His work is recorded in an article entitled "A new glycerol phthalate" which appeared in the Journal of the Society of Chemical Industries, of November, 1901. The article in question is mentioned in Schedule I of the amended particulars of objection. It describes Watson Smith's product as follows:

> As characterized chiefly by its extraordinary insolubility in almost all solvents. It is practically insoluble in alcohol ether and benzene, also petroleum and petroleum spirit. Its best solvent appears to be cold acetone but in this it is sparingly soluble. On pouring some of the solution on a watch glass and letting it evaporate spontaneously, the clear transparent resin deposited in minute drops, solidifying to hard transparent masses of the tasteless resinous body.

Watson Smith had evidently discovered a new synthetic resin which however was wholly insoluble and unusable. Yet it suggested all sorts of possibilities as an entirely new synthetic product and, as time went on, the industry began to consider what might be done with this new synthesis. Around 1912 the Watson Smith resin was investigated by chemists in the employ of General Electric Company in the United States, their names being, among others, Callahan, Arsem, Dawson, Howell and Friedburg. These chemists were trying to make out of this hard glassy substance of Watson Smith, a sample whereof was filed as exhibit 24, something soluble in available solvents and thus industrially useful, something they could spread on a surface as a coating.

The patents issued to Arsem, Dawson, Howell and Friedburg, along with others, are listed in Schedule I of the particulars of objection.

I thought convenient to make a short history of the paint and varnish industry before broaching the subject of the validity of the patent in suit.

Reverting to the Watson Smith resin which came out in 1900 and about which so much has been said during the trial, because it specifically used as the acid to combine with the glycerine phthalic acid, which is the acid mentioned in the patent in suit, I may state that this resin, as shown by the sample filed as exhibit 24, was hard and brittle. It could be made into a cast article but it was too hard and brittle to find any industrial use. Long before 1921, Kienle's alleged date of invention, ways of modifying that resin had been found, those ways being similar to the ways of modifying natural resins by mixing oils with them. It has been suggested not only to mix various oils with the Watson Smith resin but to use the acid oil instead of the oil itself. Fatty oils are glycerides or the combination of glycerine with a fatty acid. If the proposed use of the oil is the combination with glycerine and phthalic acid, the operator, by putting in the fatty acid instead of the fatty oil, will save himself the trouble of carrying the glycerine into the reaction where it already exists.

Different kinds of modifications of the Watson Smith resin were made with castor oil, oleic acid, butyric acid, etc., as evidenced by the patents aforesaid of which I propose to make a brief review in a moment.

It was submitted on behalf of defendant that there was not any inventive ingenuity in selecting fatty acids of linseed oil or linseed oil itself, since both have been put on an equivalent basis. The selection of linseed oil as the ingredient to modify the synthetic resin of Watson Smith was an accepted thing that a skilled worker in the art would do. It was urged on behalf of plaintiffs that the selection of linseed oil or the acid thereof was not an obvious thing and that consequently its adoption constituted an inventive step. The mere lack of obviousness is not sufficient to establish invention. There must be inventive ingenuity: see *Crossley Radio Corporation and Canadian General Electric Company Limited* (1), where the Honourable Mr. Justice Rinfret said (p. 555):

> Notwithstanding the very ingenious and exhaustive argument of counsel for the appellant, we would hardly think, however, he would ask this Court to give a sacro-sanct meaning to the use of the word "obvious" for the purpose of discriminating between the category of improvements which ought to be regarded as being properly inventions in the legal sense and the category of those not so regarded. We would suggest that, in England, the appearance, in later years, of the word "obvious", in judgments dealing with patent matters, probably results from the fact that, under sec. 25 (subsec. *f*) of the English Patents and Designs Act, a patent may be revoked upon the ground "that the invention is *obvious* and does not involve any inventive step having regard to what was known or used prior to the date of the patent." But although, perhaps, judgments under Canadian patent law may not have denied patentability to certain improvements upon the express ground that the advance over the prior art should be taken to have been obvious to the persons skilled in the art, the jurisprudence, both in the Canadian courts and in the Judicial Committee of the Privy Council, is not wanting in pronouncements conveying the same idea. It has long been laid down in our courts that, in order validly to support a patent, it was, of course, necessary that the art, or the improvement thereon, should be new, that it must be useful and that it must not have

(1) (1936) S.C.R. 551.

been anticipated by prior knowledge or prior user by others within the meaning of sec. 7 of the Patent Act, in force at the time of the issuance of the patent in suit; but that something additional was also required. It was essential that there should be invention and that one did not hold a valid subject-matter of a patent unless he showed the exercise of the inventive faculties (See: Halsbury's Laws of England, *vbis.* Patents and Inventions, no. 288); and that is to say, in the words of Lord Watson (*Thomson* v. *American Braided Wire Company* (1889), 6 R.P.C. 518 H.L.), "a degree of ingenuity . . . which must have been the result of thought and experiment".

See also *Shaw* v. *Burnett & Company* (1), *Bowen* v. *E. J. Pearson & Sons Ltd.* (2), *John Wright & Eagle Range Ltd.* v. *General Gas Appliances Ltd.* (3), *Sharp & Dohme Inc.* v. *Boots Pure Drug Company Ltd.* (4), *In the Matter of I. G. Farbenindustrie A. G.'s Patents* (5), *Gadd and Mason v. The Mayor, etc., of Manchester* (6).

The terms in which Kienle made his notation of this first suggestion about the use of linseed oil show that he regarded the addition of linseed oil to the Watson Smith resin as an obvious thing to do. A reference to Kienle's note book (Ex. 57) is advisable as, in my view, it confirms this statement. At page 287, under date of February 10, 1921, we find, among others, the following note:

> Talking with Dawson suggested making a resin using mixed fatty acids of linseed oil instead of deic acid as in G.P.O. Believe that this will give flexible, may be self drying resin.

Then at page 309, under date of March 15, 1921, there is the following note:

> Dawson made resin similar to G.P.O. to-day using fatty acids linseed oil as per suggestion.

I may note that G.P.O. was described by Kienle as follows (dep. p. 789):

> G.P.O. is a sort of shorthand we use for the resin made from glycerine phthalic anhydride and oleic acid.

And further on (p. 790, *in fine*):

> A. It was a name that we used in the General Electric Company's laboratories for this resin.
>
> Q. Did that get out of the laboratory into the market?—A. On the open market, I do not believe it did.
>
> Q. Was G.P.O. covered by any patent or patents, do you happen to know?—A. Yes, it it was covered by a patent taken out by an employee of the General Electric.
>
> Q. Who is that?—A. Mr. Arsem.

(1) (1924) 41 R.P.C. 432 at 440.
(2) (1925) 42 R.P.C. 101 at 108.
(3) (1929) 46 R.P.C. 169 at 177.
(4) (1927) 44 R.P.C. 367; (1928) 45 R.P.C. 153 at 191.
(5) (1930) 47 R.P.C. 289 at 322.
(6) (1892) 9 R.P.C. 516 at 524.

I think it will be advantageous to look into Kienle's note book a little more thoroughly.

On page 311, under date of March 16, 1921, we find this note:

> Dawson finished up resin from fatty acids. Tried benzol-alcohol solution. It acts in tube as G.P.O. No. 3 with vacuum. With air forms gummy mass on *bottom* of tube. Thought that air would spread varnish out. It did but resin gets sticky.

Then there is an entry of March 18, 1921, on page 313, thus worded:

> Moehle tried fatty acid resin again. It gums up the tube too much. Rejected on account of flow.

On March 21, 1921, at page 315, we read:

> Made 100:75 mixture S.O. iron treated and resin from fatty acids. Blended by heating to 200° C. Cut in coal tar oil-alcohol. Trouble was result came streaky hence got breaks in wire. Except for this fine enamel. Streaks seem to be in tube.

On March 22, 1921, at page 316, Kienle noted:

> Moehle tried Resin E.A.—Linseed Oil without T. Couldn't seem to get uniform covering. Also got beading.

The entry of March 25 is to the effect that Kienle tried a different solution with a dip process, that he did not get a very even flow, that the coating was tacky and came very beady.

On March 26 the beading was again found to be pronounced.

On March 28, at page 320, there is the following entry:

> To-day tried enameling with the 75/100 F.A.R.-L.O. mixture. Used new glass T. Ran boronized copper, cleaned only by solution. Got fair speed with I=18.0 but got uneven covering.

The entry of March 29, at page 320, shows that Kienle made 8 dips and that the coating was still porous.

On March 30, at page 321, we have the following entry:

> Tried blending G.P.O. resin with tansil (?) oil. Got negative result. Also negative result with paraffin oil. Did get blending with glycerine.

On April 5, Kienle wrote the following entry (p. 326):

> Made several quick electrolysis at 125 V. Found out washing with water or alcohol works to give more even effect. Got distinct resin in each case. Coatings very firm.

On April 8, at page 329, we find the following note:

> Tried high speeds. As speed goes up of course wire gets stickier. Also seems to get point where beading occurs again. All this phenomena is indefinite so will have to follow up further.

The last relevant entry in Kienle's note book, under date of April 21, 1921, contains, among others, the following statements:

> Tried 3.0 mill with F.A. Resin in coal tar oil/allyl alcohol. Too thin a solution again when beading stops via dip process.
>
> Allyl alcohol with coal tar oil cuts resins.

It seems evident from these entries that Kienle's only problem in 1921 was that of providing an insulation coating for fine wires and it is quite manifest that his endeavours did not meet with success.

Mr. Smart pointed out that nothing in these notes is said about air-drying, to which Mr. Chipman retorted that self-drying is the same. I must say that off-hand I felt inclined to agree with him. But looking over the testimony of Kienle on the subject I am satisfied that the two expressions are not synonymous. I believe it apposite to refer to Kienle's deposition in this connection and quote a few brief extracts.

At page 781 Kienle, asked what particular work he was doing in the research laboratory (of General Electric Company) in 1921, says: "At that time I was engaged in the study connected with the enamelling of fine copper wires, in fact, fine wires in general."

The witness then describes the operation thus (p. 783):

> A. You pass the wire over a pulley to guide it down through a varnish bath and then by a baking tower over another pulley, and in the plant you pass it down again into the bath by a tower again—in the plant, the same tower— and do that a number of times until you build up the requisite thickness.
>
> Q. That is a series of baths in an enamel and a series of bakings?—A. The same bath.
>
> Q. I mean, the thing is being subjected to bathing several times?—A. We call that a series of dips.
>
> Q. A series of dips and a series of bakes, is that right?—A. That is correct.

And further on (*ibid.*):

> A. The wire, as you can well imagine, is very weak mechanically, and it is particularly weak when it gets into the baking oven, because the temperatures in there are fairly respectable temperatures: they run to the order of magnitude of 400 to 900 degrees Fahrenheit.

Dealing with the objects he had to keep in mind in the operation, Kienle declared (p. 786):

> A. . . . In the application the wire had to, as I said, pass through the bath of the varnish and then up the baking oven. If the baking in that baking oven was not sufficiently dry or hard or baked as we call it, then when it hit the pulley at the top, which we call a sheave, it would be apt to stick on that and flake off and you would destroy the entire effect you were trying to produce. Furthermore when you return the wire to the bath you pass through the enamel and of course that had solvent in it and you wanted to be sure that it would not re-dissolve when it was in the solvent bath.

To the question as to whether the baking operation offers conundrums that have to be solved in the enamelling process, Kienle replied in the affirmative and added (p. 787):

> A. . . . You have to, as I pointed out, be sure that when you get it out of the oven it is dry, and you have to be sure that all the reactions that occur in the oven in the baking process have been carried to the proper point rapidly enough to meet the speed with which you are passing the wire through the oven.

Asked why the baking oven was employed, Kienle answered (p. 787, *in fine*):

> A. In order to give a thoroughly dry film with the proper maximum type of polmerization—I guess we can call it that.

Speaking of the use of the G.P.O. varnish in his enamelling operations, Kienle said that he was attracted by its adhesive qualities but found that it lacked the characteristic of building up insulation thickness on the wire in a reasonable number of dips and he added (p. 790):

> I had found that it also did not bake too well when it went through the baking oven I reasoned that if I could possibly get in some product the adhesive characteristics of the G.P.O. and overcome the other characteristics, especially the baking, so as to get quicker baking, baking of the order of magnitude of the temperatures I referred to in this use, we might have something that would be of value in the wire enamelling on it (art?).

Kienle specifically stated that he did not discuss drying but quicker baking. Perhaps I had better quote another passage from his testimony (p. 792):

> Q. Then did you discuss with Dawson anything more than that note presents? Did you discuss any question of drying with him?—A. No, other than the fact that I requested him to make the resin and I also stated to him that I would provide him with the fatty acids for making up the resin.
>
> Q. But did you discuss with him any question of drying of the resin? —A. No.
>
> Q. Nothing of the kind?—A. No.

Q. . . . Well, now, the note, as you read it out, had "believe that this will give flexible, may be self-drying resin." Did you discuss with Dawson the possibility that if you used these acids instead of oleic that you might get a resin with different results or speedier results in drying?—A. As I recall it, I discussed with him the possibility of getting quicker baking. That was the first thought I had with respect to this possibly new resin.

Q. Baking is a form of drying, is it not?—A. In the very broad sense only.

Q. But the note, "may be self-drying" you tell me you did discuss that with Dawson?—A. No, after I had had the conference with Dawson, that is after I had talked with him and between that time and the time I entered this note, I thought that possibly, if we had such highly unsaturated drying oil acids in the resin molecule we might be able to get something new; that is, we might be able to get the property in the resinous composition of self-drying.

Q. Will you tell me what self-drying means in reference to baking.—is it distinguished from baking?—A. Oh, yes, self-drying means the type of hardening in the physical sense. By that I mean a change of state from liquid to a solid would occur by exposure to the atmosphere or to ordinary temperatures. That is, it dries by itself.

These various extracts from the deposition of Kienle read in the whole satisfy me that the only idea which was discussed between Dawson and Kienle was not that of air-drying but that of quicker baking.

The use of linseed oil must have been considered as the obvious thing to do by the skilled persons, familiar with commercial practice, who were working with Kienle at the General Electric Company. Neither the company nor any of its employees made any attempt to obtain a patent on the new product or the process for making it. They did not produce it as an invention. They did nothing until it appeared that someone with the Dupont de Nemours Company had filed an application for a patent. In 1927 they made experiments and prepared the application for the patent in suit. This course of conduct does not indicate that these people in 1921 considered their deed as an invention.

When the time came, by the drop in the price of phthalic acid, the introduction of phenolics, the discovery of nitrocellulose and the development of the automobile industry, where an air-drying natural resin was desired, at least four chemists thought of the thing, namely Hopkins and McDermott, Weber, Carleton Ellis and Adams. They had no idea that it was an invention. The use of an oil with the resin naturally occurred to them. The whole circumstances tend to prove that it was not the kind of mental act which constitutes invention.

Regarding the inventive act it must be considered as of the date when it is alleged to have been made, to wit in 1921. According to the evidence there does not seem to have been any unsatisfied demand for the kind of air-drying resin with which we are concerned. There were many air-drying natural varnish oils available and the synthetic resins liable to dry by baking. Although the idea of the air-drying resin was allegedly noted in 1921 nothing was done in that respect and it only came on the market in 1929. This long delay entirely disposes of the question of long felt want. It does not seem reasonable to believe that there was a long felt want in 1921 which Kienle's invention is supposed to have filled when General Electric Company, a large and wealthy corporation, having the answer to that want in its possession, did nothing to satisfy it until 1929.

It seems to me expedient to make some brief comments upon the following patents: United States patent No. 1,098,728, to Kenneth B. Howell; United States patent No. 1,119,592, to Louis Henry Friedburg; United States patents Nos. 1,098,776 and 1,098,777, to William C. Arsem; United States patent No. 1,141,944, to Edward S. Dawson, Jr.

U.S. patent No. 1,098,728 granted to Kenneth B. Howell, assignor to General Electric Company, for resinous condensation product and process of making the same, on June 2, 1914, on an application filed July 25, 1913, a copy whereof was filed as exhibit I, deals with a new resinous material suitable for electrical insulation, varnishes, moulded materials, particularly characterized by possessing flexibility and elasticity.

The patentee declares that glycerol and other polyhydric alcohols combine with polybasic organic acids, e.g., phthalic acid, at an elevated temperature to form resins. He states that these resins are esters of complex molecular structures and that most of them, while stronger and tougher than the phenol resins, are still quite brittle when cold.

He says that the object of his invention is to provide resinous materials of this general nature which are pliable and elastic at ordinary temperatures.

He points out that, in accordance with the invention, an unsaturated ester containing uncombined hydroxyl groups is first made and is then acted upon at an elevated temperature by means of castor oil until combination takes place. He illustrates his invention by describing the process in detail regarding the formation of a resin into which glycerol and phthalic anhydride enter, but says that he wishes it to be understood that the process is equally applicable to the formation of resins containing other polybasic acids such as camphoric, cinnamic and citric acids. He adds that gylcol, mannitol and other alcohols may likewise be substituted in some cases for glycerine.

He describes at length the various elements which are to form part of his resin, mentioning the percentage of each of them and explaining the manner in which the product is to be heated.

He declares that the resinous material in the fusible stage may be used for insulating or coating purposes, but that preferably it is thinned by adding a solvent, such as benzol and alcohol. He states that the solution may be used as a varnish or an impregnant for fibrous or porous materials. He adds that the solvent may be evaporated either by exposing the material to the open air by heating it in a closed or evacuated container. He says that by heating for a length of time depending upon the finishing temperature of the material in the first stage of the reaction, the resin may be made insoluble and infusible without becoming porous.

He points out that it is evident that chemical combination of the resin and the oil has taken place as the oily layer commingles with the resin and cannot be extracted after hardening by means of organic solvents. He says that the oil cannot be brought into combination with the same effect with a neutral ester containing no free hydroxyl. In his opinion, these facts point to a chemical combination of the ricinoleic and isoricinoleic acids and the uncombined hydroxyl groups. He observes that undoubtedly some dissociation of the castor oil takes place and, as fast as the ricinoleic acid combines with the resin, the dissociation continues.

He concludes in saying that the final product when hardened is a reddish brown elastic material which is transparent in relatively thin layers.

He says that the hardened resin is entirely unattacked by methyl alcohol or acetone and that the ordinary glycerine phthalate swells into a gelatinous sticky mass in contact with the solvents.

Three of his five claims concern the process; the other two deal with the product. I may quote claim 4 which is typical:

> 4. A resinous material formed from castor oil and an unsaturated ester of a polyhydric alcohol and a polybasic acid, said resin being soluble in a mixture of benzol and alcohol, fusible without decomposition, and convertible to an insoluble, infusible, pliable, elastic material.

U.S. patent No. 1,119,592 granted to Louis Henry Friedburg, assignor to General Electric Company, for plastic condensation product, on December 1, 1914, following an application filed September 12, 1912, a copy whereof was filed as exhibit R.

Friedburg, in his specification, declares that the "invention comprises a new plastic composition and the process of making the same" and that "its object is to provide a synthetic resin, suitable for electrical insulation, moulded articles and the like, which possesses flexibility and may be rendered insoluble and infusible without loss of flexibility."

It was an old practice to add oily materials in spirit varnishes made of natural resins to make them more flexible.

The patentee declares that glycerol and other polyhydric alcohols and polybasic acids or anhydrides, such as phthalic anhydride, combine at an elevated temperature to form fusible and soluble resins. He says that upon further heating these resins become infusible and insoluble and that they, both in their intermediate and final state, although strong and hard, are usually quite brittle.

Friedburg wanted flexibility in his resin and he developed a method whereby he could incorporate butyric acid in the resin. His method consists of heating two parts by weight of phthalic anhydride and one part of glycerol in a suitable container to a temperature of about 100° C., the temperature being slowly increased to about 185° C. He says: "The mixture is maintained at this temperature until distillation of water, acrolein and other vapours ceases." He adds that the temperatures may be allowed finally to rise as high as 210° C. He declares that, when a sample taken from the mass upon cooling is hard and brittle without being sticky, the first part of the reaction is completed. According to him "the product is a colourless or yellowish resin, fusible, and soluble in acetone".

He states that about 22 parts of the resulting resinous product are dissolved, with about 10 parts of butyric acid, in glycerol and heated, using a reflux condenser, for a period varying with the quantities and other conditions from eight to twenty-four hours. He says that the product is then heated under conditions permitting the removal of vapours, in an open vessel, at a temperature of about 300° C. until distillation ceases and samples taken from the mass show proper consistency. He declares that "the product is a very soft, rubber-like brownish mass, also soluble in acetone". He states that "for impregnating fibrous or cellular matter, such as electrical coils wound with fabric, or wood, cloth, paper and the like, the acetone solution may be used and the solvent subsequently evaporated".

He adds that the fusible, soluble resin may be rendered infusible, and apparently insoluble, without destroying its flexibility by heating for about two to three hours to about 100-120° C.

He points out that the resin is saponifiable with alkali to yield the polyhydric alcohol used, for example, glycerine and a compound of the alkali with the respective acids used.

He states that either normal butyric acid or isobutyric acid may be used in carying out the process.

The patentee then mentions the proportions of phthalic anhydride, glycerol and isobutyric acid, which I do not believe necessary to relate in detail.

The patent contains seven claims, two of which deal with the process; the others refer to the product. In claims 5 and 6 the patentee mentions monobasic aliphatic acid.

This term includes all of the fatty acids in oils whether they be of the oxidizable type, the saturated or partially saturated type.

Claim 6, which is typical, reads thus:

> 6. As a composition of matter, a flexible resinous condensation product saponifiable with alkali to form a polyhydric alcohol and a phthalate and a compound of a monobasic, aliphatic acid.

U.S. patent No. 1,098,776, granted to William C. Arsem, assignor to General Electric Company, for resinous condensation products and process of making the same, on June 2, 1914, on an application filed September 12, 1912, a copy whereof was filed as exhibit 68. The specification states that the invention comprises a new plastic composition and the process of making the same and that its object is to provide synthetic resinous compositions which may be rendered insoluble and infusible and which are suitable for the production of moulded articles, electrical insulation, varnishes, etc.

The patentee declares that glycerol and other polyhydric alcohols combine with organic acids, particularly polybasic acids, at an elevated temperature to form resins, which are esters of molecular structure. He points out that two or more molecules of organic base or alcohol may combine with two or more molecules of acid, the molecular structure probably varying with the proportions and conditions.

He says that in accordance with his invention an ester is formed from a polyhydric alcohol and a polybasic acid in such proportions that unesterified hydroxyl groups remain. He says that such an ester is then combined with another organic acid or acid anhydride to complete the esterification, thus producing mixed esters of fairly definite composition.

The patentee then illustrates his invention with reference to the formation of a glycerol mixed ester of phthalic acid and succinic acid. I do not think that this illustration, which is rather extensive, need be reproduced.

He states that his product when cold is slightly elastic and "will recover when stretched similar to rubber". He states that "the compound when heated for a short time loses its flexibility and becomes a strong, tough, clear solid mass, free from bubbles" and that "it is infusible and is insoluble in the usual solvents". He says that all these resins are esters having a molecular structure comprising two like radicals of acid and an unlike radical. He declares that in some cases mixtures may be prepared and gives examples, which I do not deem necessary to relate. He points out particularly that glycerol esters of organic acids, as "tartaric, glutaric, camphoric, malic acids in which not all the hydroxyl groups of the alcohol radical have been esterfied may be treated with an additional portion of acid to complete the esterification". He states that in fact the ester of an acid such as phthalic, containing unesterified hydroxyl groups, may be treated with an additional amount of phthalic anhydride to form a neutral cyclic ester and that the procedure also applies to resins of polyhydric alcohols other than glycerol, for instance, glycol and mannitol.

Dealing with the replaceability of the acids by each other he says:

> Other dibasic acids may be used to esterify the remaining hydroxyl groups, and also equivalent amounts of various monobasic acids, and substituted dibasic or monobasic acids, may be employed.

He specifies that he may use propionic, stearic, palmitic, oleic, benzoic acids or such substituted acids as lactic, salicylic, glycollic, chloracetic, chlorbenzoic and chlorpropionic.

He concludes in saying that, in fact, mixtures of these acids may be used in some cases and that various substances not strictly acids but having acid properties may be employed. He then cites examples which I do not deem useful to reproduce.

The patent contains seven claims, the first four of which concern the process. Claim 5, concerning the product, is thus worded:

> 5. A composition of matter, comprising a neutral mixed cyclic ester of a polyhydric alcohol, phthalic acid and succinic acid, said material being hard, tough, fusible and soluble in common organic solvents and convertible to an insoluble, infusible state by heating.

U.S. patent No. 1,098,777, granted to William C. Arsem, assignor to General Electric Company, for resinous condensation products and process of making the same, on June 2, 1914, pursuant to an application filed July 25, 1913, a copy whereof was filed as exhibit A. The specification declares that the invention relates to "synthetic resinous compositions which may be rendered insoluble and infusible, and which are suitable for the production of molded articles, electrical insulation, varnishes, etc."

The patentee states:

> Glycerol, and other polyhydric alcohols, combine with various polybasic acids at an elevated temperature to form resins. These resins apparently are esters of complex molecular structure. Two or more molecules of organic base or alcohol may combine with two or more molecules of acid, the molecular structure probably varying with the proportions and the conditions.

Further he says:

> In accordance with my present invention esters are formed from a polyhydric alcohol and a polybasic acid in such proportions that free or unesterified hydroxyl groups remain, and such esters are then combined with oleic acid to complete the esterification, thus producing mixed esters of fairly definite composition having properties which render them especially valuable for electrical insulations

The patentee then states that an ester of a polyhydric alcohol, as glycerol, and a polybasic acid, as phthalic acid or its anhydride, is first prepared, the two ingredients being used in such proportions that unesterified hydroxyl groups remain.

Further on Arsem states that he takes one and one-half gram-molecules of phthalic anhydride and combines that with one gram-molecule of glycerine. He says that in the preparation of the preferred form of resin one-fourth gram-molecule of phthalic anhydride is replaced by oleic acid. He points out that oleic acid being a monobasic acid one-half gram-molecule of the same is required to replace one-quarter gram-molecule of the dibasic phthalic anhydride.

He declares that "instead of combining with the glycerine all of the phthalic anhydride to be added" he prefers to "combine 1 gram-molecule of glycerine with 1 gram-molecule of phthalic anhydrid and then to add the rest of the phthalic anhydrid with the oleic acid".

After discussing the effect of the oleic acid and its proportion in the resin according to the proposed use of the latter, Arsem states that the resinous condensation product thus obtained is "a thick reddish liquid which congeals at room temperature and is soluble in various organic solvents such as benzol, naphtha, turpentine, coal tar oil, and the like". He adds that "the material may be made insoluble and infusible by continued heating about twenty to thirty hours at a temperature of about 160° C., but remains flexible". He points out that the flexibility may be varied by varying the proportions of the phthalic and oleic acids and that decreasing the amount of oleic acid decreases the flexibility of the resin.

He declares that the liquefied resin or its solution may be used as an impregnating material for fabrics, paper, wood or the like in the electrical arts or may be used as a varnish applicable directly on metal surfaces for insulating or other industrial purposes. He says that the resinous material may also be used in the production of moulded compounds and for this purpose may be mixed in the liquid or dissolved state or as a dry powder with a filler such as asbestos, clay, ground slate, silicia and the like and moulded under pressure.

He admits that the change in physical properties due to the hardening treatment is not entirely understood but is probably due to a polymerization in molecular structure.

The patent contains four claims, one of which deals with the process. Claim 3 concerning the product is perhaps the most typical:

> 3. A flexible, fusible, soluble resinous product of a polyhydric alcohol, phthalic anhydrid, and oleic acid, said material being convertible by heating to an insoluble, infusible state, while retaining flexibility.

U.S. patent No. 1,141,944, granted to Edward S. Dawson, Jr., assignor to General Electric Company, for resinous composition and process of making the same, on June 8, 1915, pursuant to an application filed April 9, 1914, a copy whereof was filed as exhibit M.

The specification states that "the present invention relates to the class of resinous organic condensation products made by the chemical interaction of polyhydric alcohols and polybasic acids, and particularly to the class of mixed esters such as described in an application filed September 12, 1912, by W. C. Arsem, Serial No. 719,994."

The patentee declares that it is the object of the invention "to prepare a resin having a high dielectric strength, and a tenacity and flexibility which enables it to be used for a wide variety of purposes in the electrical art, and which may be converted by a short heat treatment from a fusible to an infusible state."

He says that when two molecular proportions of a polyhydric alcohol, e.g., glycerol, are acted upon by three molecular proportions of phthalic acid or its anhydride a saturated soluble, fusible, resinous ester is produced convertible to a tough, hard, infusible, insoluble resin by heat. He adds that other acids, namely cinnamic, citric and succinic, may be similarly combined with polybasic alcohols. He points out that a mixed ester may be prepared by substituting for part of the polybasic acid a monobasic acid, such as oleic acid, thereby producing a flexible resin which adheres tenaciously to metallic surfaces.

He says that in accordance with his invention

> A neutral oily ester such as castor oil as well as a monobasic acid is associated with an unsaturated ester, preferably the glyceryl phthalate, to form a resin convertible to the insoluble, infusible state in less time than the resins described and having superior insulating and mechanical properties.

He states that the castor oil preferably replaces some of the monobasic acid and is added to the unsaturated resin together with the monobasic acid.

The patentee then gives a specific example purporting to illustrate his invention, which I do not think necessary to reproduce.

He says that the condensation products containing the castor oil may be dissolved in a suitable menstruum, such as benzol, naphtha, turpentine, coal tar oil and the like, to form a varnish having adhesive properties superior to a solution of resin containing no castor oil.

The patentee declares that the varnish may be used for impregnation of fabric, paper or the like, for the insulation of electrical apparatus or may be applied directly on the surface of electrical conductors as it adheres tenaciously to bright metallic surfaces. He states that in the latter state the resin is preferably mixed with various mineral fillers as clay, flint, chromium oxid, red oxid of iron, which act as a spacer and a ready conductor of heat. He says that the coating thus applied may be rendered infusible by heating without losing its flexibility.

There are nine claims in the patent, six of which relate to the product. Claim 3, which seems to me typical, is thus worded:

> 3. A resinous composition comprising a mixed glycerine ester of phthalic and oleic acids, having indistinguishably incorporated therewith castor oil, said composition being convertible by heat to an infusible, insoluble, flexible resin from which the castor oil is non-separable by solvents.

This closes the analysis of the material patents which preceded Kienle's application.

An article entitled "Alkyd resins as film-forming materials" by R. H. Kienle, the inventor, and C. S. Ferguson, of General Electric Company, was published in the issue of April, 1929, of the review "Industrial and Engineering Chemistry". The pages of said issue containing the article in question were produced as exhibit L. The article supplies pertinent and material information relative to the knowledge of the art, particularly of the use of alkyd resins, in and prior to the year 1921, the alleged date of invention of Kienle. I think it is proper to quote a few brief excerpts of this article.

In a short but substantial statement of the situation of the use of alkyd resins as film-forming materials, the authors submit *inter alia* the following facts (p. 349):

> During 1911-1915 Callahan (Callahan, U.S. Patent 1,108,329 (1914), et al.) at the Pittsfield works laboratory, together with Arsem, (Arsem, U.S. Patent (1914)), Dawson (Dawson, U.S. Patent 1,141,944 (1915)) and Howell (Howell, U.S. Patent 1,098,728 (1914)) at the Schenectady research laboratory of the General Electric Company, carried out an extensive investigation into the glycerol-phthalic anhydride reaction, and as a result new and useful resins were made. They became particularly interested in the resins because of their heat irreversibility.

In the following paragraph Kienle and Ferguson set forth these facts:

> Arsem and his co-workers studied the alkyd reaction as a whole and the preparation of numerous other resins based on this reaction—i.e., they replaced the phthalic anhydride in whole or in part with other polybasic acids and in part with some monobasic acids. In addition they studied flexibilization, working chiefly with castor oil as the flexibilizing agent. They ascertained many characteristics of the resins and pointed out the possibility of using them as film-forming materials. They found the resins to be extraordinarily good stickers and, working with solutions of the resins, they obtained very adherent, tough, varnish-like films on metals if these films were properly baked. They only worked with a few simple solvents, such as acetone, alcohol-benzene, and coal-tar oil-alcohol. With these solvents films of poor bodying characteristics and

with decided tendencies to pull up, owing to high surface-tension effects, were the best they obtained. In only one case did they obtain a satisfactory result. Dawson, working with alcohol-benzene solutions of a glycerol-phthalic anhydride-oleic acid resin, was able to obtain smooth, tough, adherent films on metals, but the film-building properties of this varnish were poor.

Then on page 350, under the heading "Recent Developments", are the following observations:

> During the war the introduction of the Gibbs process for the manufacture of phthalic anhydride by catalytic oxidation of the vapors of naphthalene resulted in cheap phthalic anhydride. Following this, nitrocellulose lacquers were developed, which led to the commercial availability of many types of new solvents. These two developments awakened a new interest in the alkyd resins as film-forming materials.

On page 351 we find these comments:

> *Film Characteristics.* The films prepared from baking solutions are invariably very adherent, hard, and tough. Properly baked, a very good gloss results. The films can be made exceedingly flexible for their hardness.

Finally on page 352, under the title conclusion, there are, among others, the following remarks:

> In general, we can divide these solutions into (1) baking, and (2) air-drying. The former require heat to develop their maximum properties, outstanding of which are toughness, adhesiveness, flexibility, oil resistance. The latter require primarily reaction with oxygen, although heat can also be used, in which case its function is essentially to speed up the oxygen reaction. These air-drying films possess the same outstanding properties as the films from the baking solutions, together with an additional pronounced film-building characteristic.

This article shows that at the time under consideration therein it was the baked films that were sought for the purpose to which Callahan, Dawson, Arsem and Howell were directing their investigations and that, in case films were desired for other purposes where baking was not available, then linseed oil or a somewhat similar ingredient would be used.

After a careful perusal of the evidence and of the able and exhaustive argument of counsel I have reached the conclusion that there is lack of subject-matter in the patent in suit and that accordingly the said patent must be declared invalid, null and void and that it must be struck from the record.

There remains the question of anticipation which I could abstain from examining in view of the conclusion to which I have arrived concerning the lack of invention, but as very likely my opinion will not be unanimously accepted, I deem it apposite to deal briefly with the question.

Anticipation may be considered as of two dates, 1921 and 1927. The two dates are important, as intervening between them are the patents and applications mentioned in Schedule II of the particulars of objection.

I do not believe that Kienle is entitled to the date of 1921. The evidence has not convinced me that his invention was then sufficiently developed to constitute an invention. All that Kienle had at that time was an idea or a vision, such as could not be considered as an invention reduced to practical shape.

The remarks of Viscount Cave L.C. in *The Permutit Company* v. *Borrowman* (1) seem to me pertinent:

> 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

Mere conception is not invention and a party who pretends to be the first inventor of an object but who has not published his invention is not entitled to priority over a later inventor who has made it public: *Gerrard Wire Tying Machines Company Limited* v. *Cary Manufacturing Company* (2). I deem it convenient to quote an extract from the judgment of the late president, Maclean J., which has some relevance (p. 179):

> Upon another ground Cary cannot, I think, even assuming he did all he claims to have done early in 1919, be held to be the first inventor. Mr. Anglin very ably and ingenuously put forward the contention that a person who conceives an invention, and who is in a position if and when he chooses to produce a physical embodiment of his mental conception, is in law an inventor in this country. Mr. Anglin of course conceded that such a person might have great difficulty in establishing his invention by satisfactory evidence, but in this case he thought that difficulty had been overcome by Cary on the facts already related . . . 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 embodiment" of the conception, which was never disclosed would void the patent of a subsequent inventor who had first and effectively diclosed 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 communicated 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

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(1) (1926) 43 R.P.C. 356 at 359. (2) (1926) Ex. C.R. 170.

> 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.

And further on (p. 180):

> It seems to me that the first inventor must and should mean in patent law, not the first discoverer or the first to conceive, but the first publisher, and publication is always a question of fact. That person must, however, be a true inventor, that is he must not have borrowed it from anyone else. This principle was laid down in Great Britain by the courts there as early as 1776, and is there still accepted as expressing the law. In the case where a person who was first granted a patent was not in popular language the first inventor because somebody had invented it before him, but had not taken out a patent for it, it has been decided that the former was entitled to a grant provided the invention of the first inventor had been kept secret, or without being actually kept a secret had not been made known in such a way as to become part of the common knowledge or of the public stock of information. Therefore, the person who was in law held to be the first and true inventor was not so in popular language because one or more people had invented before him, but had not sufficiently disclosed it. *Plympton* v. *Malcolmson* (1876), 3 Ch. Div. 531, Jessel M.R., at pp. 555, 556; *Dollonds Patent* (1766)), I W.P.C. 43; *Cornish* v. *Keen* (1835), 1 W.P.C. 501; *Smith* v. *Davidson* (1857), 19 Court of Sessions 691, at p. 698—2nd Series; *Robertson* v. *Purdy* (1906), 24 R.P.C. 273, at p. 290; *Ex parte Henry* (1872), 8 Chan. App. 167.

Dealing now with the question of anticipation, I think it advisable to review certain patents relied upon by defendant.

The first is the United States patent No. 1,422,861, for liquid-coating composition, granted to Western Electric Company, Incorporated, assignee of Carl D. Hocker, on July 18, 1922, following an application filed on December 11, 1919. A copy of the specification was filed as exhibit D.

The specification says that the "invention relates to the production of suitable resinous compositions which may be employed as the base in the manufacture of varnishes, impregnating compounds, lacquers, enamels, japans, and the like" and that "more particularly it has to do with the use of such coating when heat is applied thereto to facilitate the drying thereof".

The patentee declares that an object of his invention is to produce a liquid-coating composition which, after application with the aid of heat, converts it into a semi-solid through chemical action and with continued heating forms a hard, firm, continuous and durable coating.

He states that it has been found that "such compositions may be formed by combining under the proper conditions a resin, such as Congo copal, shellac, Manila copal, etc., one or more free fatty acids and a polyacid alcohol such as glycerine". Hocker says that in carrying out the preparation of this compound, the resin and free fatty acids are mixed in suitable proportions until, with the aid of heat, a uniform homogeneous mass is obtained. He adds that this condition having been achieved the polyacid alcohol is added and the temperature increased until the mass again becomes homogeneous. He then sets forth an example, which I do not think necessary to reproduce.

He declares that the compound thus produced possesses the property of gelatinizing upon further application of heat without the addition of other substances.

He states that while the above method is sufficient to produce the desired result it is expensive because of the large amount of free fatty acid and polyacid alcohol required and that by substituting a vegetable oil, e.g., castor oil, for part of the glycerine and part of the acid, the cost of the material will be decreased and the product will be identical for practical purposes.

The patentee then describes the method of producing the liquid-coating composition under this alternate process and concludes that the composition will then be in such a state that further heating will cause gelatinization.

He states that before the gelatinization is carried out the composition is applied to the surface which is to be coated and that it is desirable, in some cases, to add organic solvents, such as kerosene, in order to render the composition more liquid. He says that, when a smooth, uniform covering has been secured, heat is applied in such a manner that a gradual thickening of the fluid coating takes place and that the temperature is increased until solidification occurs.

He states that it is to be understood that, although Congo copal and shellac have been mentioned, it is intended to include any resin which has the property of forming a gelatinous product with a polyacid alcohol and that in referring to vegetable oils or fatty oils all oils which will, upon saponification, yield one or more fatty acids are included. He adds that some of the oils which have been used are Chinese wood oil, corn oil, castor oil, linseed oil, soya bean oil, rapeseed oil, sesame oil, cotton-seed oil and peanut oil.

The patentee then gives a list of the acids intended to be included as belonging to the fatty acid class.

Claim 3 referring to the product, which seems to me typical, reads thus:

> 3. A liquid-coating composition resulting from a combination comprising glycerine, Congo copal, free fatty acid and castor oil.

The Canadian patent No. 223,007, for liquid-coating compositions, granted to International Western Electric Company Inc., assignee of Carl D. Hocker, on August 22, 1922, following an application filed on May 23, 1921, is similar to the United States patent previously mentioned. A copy of the specification attached to the Canadian patent was filed as exhibit C.

The terms of the United States patent No. 1,422,861 to Hocker (exhibit D) are such that the patent constituted a disclosure to a person skilled in the art as of the date of the patent, the application for which was filed on December 11, 1919, of the modification of a resin, synthetic or natural, by fatty acids of the drying oils. These fatty acids are clearly indicated in the patent as the modifying agent. The last paragraph of the specification outlines the different series of the acids to be used, including those with a single bond, a double bond, two double bonds and three double bonds. The list includes the linoleic, linolenic and oleic series. The acids of linseed oil are mentioned in the evidence; on line 15 of page 2 of the patent, the oils from which the acids are to be derived include linseed oil.

It was submitted on behalf of plaintiffs that Hocker does not, in his specification, refer to a synthetic resin. Indeed what he says at lines 43 and following on the first page of the patent is "combining under the proper conditions a resin, such as Congo copal, shellac, Manila copal, etc."

I am satisfied that the term "a resin" addressed to a person skilled in the art on December 11, 1919, would mean a synthetic resin as well as a natural resin. As a matter of fact, that date is long after Arsem and Friedburg had produced the Watson Smith resin modified with different agents. The Watson Smith resin had been before the public for years, so that the art was aware of synthetic as well as natural resins. In addition there is the statement of McWhorter that to him or to a chemist the term "resin" as used in the Hocker patent would mean synthetic as well as natural resins.

In the circumstances I believe that the Hocker patent (exhibit D) constitutes an anticipation because it is the use with the synthetic resin of Watson Smith, including glycerine and phthalic acid, of the acids of linseed oil.

The next patent to which I deem fit to refer is the United States patent No. 1,803,174, for a resinous condensation product and method of preparation, granted to General Electric Company, assignee of Edward S. Dawson, Jr., on April 28, 1931, pursuant to an application filed on May 23, 1925, and renewed on November 28, 1928. A copy of the specification was filed as exhibit N.

The specification states that "the present invention comprises an improved resinous composition made by chemical combination and condensation of an aliphatic polyhydric alcohol, such as glycerine, one or more polybasic acids and a small portion of sulphuric acid".

The patentee declares that he introduces "to advantage into the resin a fatty acid component, preferably an acid derived from drying oil, such as linseed oil or China-wood oil".

He says that as a consequence of his invention he has provided resins capable of being transformed from a fusible, soluble state to an infusible, insoluble state in a shorter time than similar resins heretofore produced and which have superior physical properties, in particular are capable of polymerization or setting with a hard surface while retaining elasticity or flexibility.

He states that the utilization of sulphuric acid in accordance with his invention which involves the heating together of the resin-forming constituents with a relatively small proportion of sulphuric acid, may be distinguished from the use of such acid as an ordinary catalyzer by the fact that the chemical reaction which would occur in the absence of the sulphuric acid is modified by the latter as evidenced by the colour of intermediate products, the odour of gaseous by-products and the distinct physical properties of the ultimate resinous product.

The patentee then gives two methods of making his resinous composition and states:

> When this resin, produced by either one of the above methods, is heated for a sufficient length of time, it becomes infusible and insoluble and has a hard glass-like surface, while possessing considerable flexibility. It is tough and strong and therefore well suited for use as a binder in moulding compounds, as a wire enamel, and as a protective coating for metals. The resin is resistant to moisture, oil and acid. It is also highly adhesive to metal surfaces. It may be applied either by spraying the parts to be coated or by dipping them into the fluid resin.

The patentee declares that a film consisting of this new resin on a surface of a metal can be hardened in about thirty minutes at 210° C., whereas similar resins made without sulphuric acid will require several hours for hardening. He adds that in some cases the resin can advantageously be dissolved in a high boiling point solvent and a solution applied as a varnish to parts to be coated.

He says that the flexibility of the resin may be increased by incorporating material such as China-wood oil or castor oil with the resin in the high boiling point solvent.

Claim 1 may be cited as typical:

> 1. A resin comprising the reaction product of an aliphatic polyhydric alcohol and a polybasic acid, a fatty acid derived from a drying oil and a small proportion of sulphuric acid.

The Canadian patent No. 292,353 granted to Canadian General Electric Company, Limited, assignee of Edward S. Dawson, Jr., on August 20, 1929, pursuant to an application filed on April 4, 1927, for resinous condensation products and methods of preparation, a copy whereof was filed as exhibit O, is substantially similar to the United States patent No. 1,803,174 previously mentioned. It has omitted the word "aliphatic" before the words "polyhydric alcohol" wherever they are found in the body or the claims of the latter. In addition some of the claims are differently drafted and the last claim (No. 8) of the United States patent has been left out. A certified copy of an oath dated March 29, 1927, signed by Edward S. Dawson, Jr., filed as exhibit P, states that the affiant verily believes that he is the inventor of certain new and useful improvements in resinous condensation products and methods of preparation described in the specification relating thereto, and for which he solicits a patent, by his petition dated March 29, 1927, and that no application for a patent for said improvements has been filed by him or others with his consent in any country foreign to Canada, except as follows:

United States serial No. 32,447 filed May 23, 1925;

England, filed May 21, 1926;

France, filed May 21, 1926, Pat. 616,463;

Germany, filed May 22, 1926.

The Dawson patents exhibits C and D only differ from the patent in suit by the use of a small quantity of sulphuric acid to accelerate the reaction of the product.

It seems to me expedient to analyse five other decisions in cases dealing with resins, mentioned in Schedule II with defendant's particulars of objection.

United States patent No. 1,773,974, for film, granted to Carleton Ellis on August 26, 1930, following an application filed on September 23, 1926. A copy of the patent was filed as exhibit T.

The specification states that

> This invention relates to a duplex or composite film containing a cellulose ester such as cellulose acetate or nitrate or other soluble cellulose compound and relates especially to a duplex film comprising a pigmented layer and a non-pigmented or substantially transparent film comprising nitro-cellulose and a synthetic resin compatible therewith.

The patentee declares that when the film is applied to a supporting surface the protecting and exposed stratum consists of nitrocellulose and a synthetic resin compatible therewith. He says that this stratum is preferably free from pigment, whereby a fine lustrous effect is obtained. He further says:

> As a synthetic resin I prefer those made from glycerol (or glycol, pentaerythritol, and the like, or mixtures of these various polyhydric aliphatic alcohols) and a crystalline acid or anhydride such as phthalic acid or anhydride, together with the free fatty acid or a glyceride oil, particularly the various vegetable oils such as the fatty acids of linseed oil, cotton seed oil, soya bean oil, rape-seed oil, and the like. Resins of this general character greatly increase the life of the nitrocellulose films as compared with films made from the same nitrocellulose with a like proportion of rosin, damar, and other natural resins.

The patentee then points out that these oil-acid-glyceride resins give to nitrocellulose a greater durability than that obtained with modified natural resins such as rosin ester or ester gum.

The patentee declares that nitrocellulose is impaired in durability by the addition of most of the natural resins. He states that films are desired containing a large amount of resin in order to obtain a considerable degree of thickness with the application of only one or two coats of a solution containing such resin and nitrocellulose. He adds that on the other hand all synthetic resins compatible with nitrocellulose improve the life of nitrocellulose films and cooperate, for instance, with nitrocellulose of low viscosity to produce durable films. He says that among the synthetic resins appropriate for the aforesaid purpose and compatible with nitrocellulose of low viscosity are those made from an oily fatty acid, a polyhydric alcohol such as glycerol and an organic acid of what may be termed the crystalline type, including tartaric, citric, malic, benzoic, phthalic and similar acids or less definitely crystallizable acids of the type óf lactic.

The patentee then gives an illustration of his invention which I do not consider useful to cite.

He concludes in saying the the composition set forth for making the lustrous finish is one which shows remarkable endurance to weather, even though low viscosity nitrocellulose be employed. He states that

> the high degree of compatibility of low viscosity nitrocellulose, . . . with the vegetable oil fatty acid phthalic glyceride resins secures a cooperative effect whereby the tendency of the low viscosity nitrocellulose films to disintegrate on exposure is overcome by the presence of the resin and a durable product results.

Claim 6, which is typical, reads thus:

> 6. A film serving as a coating on a supporting article comprising a pigmented substratum adjacent a supporting surface of said article and a superposed and exposed substantially transparent protecting stratum comprising nitrocellulose, a synthetic resin of the oily fatty acid phthalic polyhydric-aliphatic-alcohol type.

United States patent No. 1,690,515, for composition of matter containing a cellulose derivative, granted to Ellis-Foster Company, assignee of Harry M. Weber, on November 6, 1928, following an application filed on October 13, 1925. A copy of the specification was filed as exhibit S.

The specification states that the

> Invention relates to a composition of matter comprising artificial resins, and relates especially to resins of complex constitution prepared from drying and semi-drying oils and their fatty acids, an organic acid other than the fatty acids from oils, and a polyhydric alcohol, such complex resins having incorporated with them a toughening agent, such as an ester or ester of cellulose, particularly nitrocellulose . . .

The patentee says that

> In the present invention resins prepared from drying or semi-drying oils, such as castor oil, linseed oil, or their fatty acids, an organic acid, such as phthalic anhydride, and glycerol, glycol, or other appropriate alcohol, toughened by means of a cellulose ester or ether, are superior in that compositions so prepared are less susceptible to outside influences, such as moisture, light, etc., particularly where such composition is to be used for the preparation of lacquers or lacquer enamels, which would be subject to exposure to the weather.

The patentee points out that the resins prepared from the fatty acids of drying or semi-drying vegetable oils are superior to those made with the drying oils themselves in that they can be prepared with less danger of polymerization and that a homogeneous resin is produced containing no free oil liable to interfere with the production of suitable articles for all purposes when blended with a cellulose ester or ether.

The patentee then cites various examples which I do not think necessary to reproduce.

He states that in the examples given phthalic anhydride has been cited as the organic acid used but that it is to be understood that other organic acids, such as benzoic, maleic, tartaric, succinic or mixtures of these, may also be used and be within the scope of the invention.

He points out that vegetable oils and fatty acids obtained from vegetable oils other than those mentioned in the example can also be used, such as soya bean oil, linseed oil, cocoanut oil, China-wood oil or products obtained by blowing these oils or mixtures of them.

Claim 4, which is typical, reads thus:

> 4. A composition of matter comprising a cellulose ester and the reaction product of a vegetable oil, free fatty acids obtained from vegetable oil, a polybasic organic acid and a polyhydric alcohol.

United States patent No. 1,893,874, for resinous compositions and method of making, granted to General Electric Company, assignee of Lester V. Adams, on January 10, 1933, following an application filed on June 25, 1926, a copy whereof was filed as exhibit F.

The specification says that this application is a continuation in part of an application filed on June 13, 1924.

The patentee declares in his specification that the

> present invention comprises new resinous compositions which are useful for coating and other purposes and which are made by the combination of resinous condensation product and oil, preferably drying oil.

He states that natural resins, such as copal, can be readily combined with an oil, e.g., linseed oil, by heating the resin and the oil in contact with each other. He points out that some synthetic resins, such as the phenolic and the glyceride resins, cannot be caused to combine with oils in this manner. He adds that in some cases complex bodies have been prepared from a resinous material containing free hydroxyl groups by heating the resin and an acid derived from an oil until chemical combination took place.

He declares that, in accordance with this invention, resinous condensation products of the heat-hardening class are combined with non-resinous esters of the aliphatic series by the dispersion of one of said substances in the other to form new materials having properties differing from either of the constituents. He gives an example and goes on to say that his invention is particularly applicable to resins resulting from the chemical reaction of polyhydric alcohols and resinifying carboxylic organic acids such as polybasic acids or anhydrides thereof, these resins being termed generically polyhydric alcohol-polybasic acid resins.

He says that the term "dispersion" is used "in a general sense which includes chemical combination, solution and colloidal suspension as special cases".

He states that varnish bases constituted of a heat-hardening resin and a drying oil, that is an oil containing an unsaturated, oxidizable fatty acid, constitute an example of his invention.

He says that the combination of the resinous material and the oil is preferably carried out by heating these materials in the presence of a high boiling point liquid, which may or may not form part of the product.

Specific examples are given to illustrate the invention; I do not think expedient to deal with them.

The patentee declares that "the resin-oil complex constituting my invention may be applied as a varnish or as a solution in any suitable solvent"; also that "material prepared by any of the above processes and freed from solvent, or largely so, may also be used as a molding composition, and for this purpose may be mixed with various fillers"; and finally that the "material may be applied upon wires and other metal surfaces as an insulating enamel and may be used as a cement for such products as laminated mica compositions".

The patentee adds that while his invention is applicable particularly to blending oils with synthetic resins it can be applied to blending oils with resins with which oils blend with difficulty by ordinary methods.

Claim 1 may be quoted as typical:

> 1. A composition comprising a resinous polyhydric alcohol-polybasic acid condensation product which is capable of being rendered infusible by heating, and a fatty acid glyceride, said ingredients being indistinguishably united, and said composition being soluble in one or more liquids in which said condensation product is insoluble.

On August 1, 1925, Lester V. Adams, the patentee aforesaid, applied for a patent in Canada. A patent bearing No. 262,979, for resinous compositions and method of making, was granted to Canadian General Electric Company, Limited, assignee of the applicant, on July 27, 1926. A certified copy of the specification was filed as exhibit B.

The specification, which differs somewhat from that of the United States patent, may perhaps be summarized briefly. It states that

> the present invention relates to the preparation of resinous compositions of the general nature of a varnish or a japan base and comprises an indistinguishable mixture or blend or a resin and an oil, in particular a blend of a resin made by the esterification of polyhydric alcohol and polybasic acids or derivatives thereof, as for example, the resin made from glycerine and phthalic anhydride, and a glyceryl ester of a fatty acid, preferably a drying oil, such as china-wood oil or linseed oil.

The patentee says that in accordance with the preferred method of carrying out his invention the two classes of materials, that is resinous and oily esters, are incorporated with one another by causing these compounds to be dispersed in a solvent of relatively high boiling point by heating the materials to be incorporated in contact with the solvent at an elevated temperature. He points out that unless the presence of a high boiling or non-volatile solvent is required it is removed after the dispersion in the solvent is complete and the resulting viscous mixture constituting the desired base is dissolved in an ordinary volatile solvent or otherwise utilized.

The patentee submits an example which I do not think necessary to reproduce. He then says that the term "dispersion" is used in a general sense which includes solution and colloidal suspension as special cases. He adds that, when the solvent is removed, a sticky and viscous mass remains which constitutes a complex or blend of a glyptal and the oil.

He states that the resin-oil complex may be dissolved in suitable volatile solvents, as for example the aromatic compound known as "solvent naphtha", and, when the solvent is evaporated after application of the varnish, a tough flexible film is produced. He says that the material constituting the film is infusible and insoluble, is highly resistant to oil, will withstand temperatures and is more flexible and adhesive than other similar enamels.

He declares that the "glyptal which is preferably introduced in its initial stage of combination, i.e., the state in which it is fusible and soluble, is partly cured or rendered less fusible and less soluble by the heating step in contact with the high boiling point solvent". He explains that "during the process of incorporating the glyptal resin in its loosely combined fusible state, the esterification reaction between the glycerine and the phthalic anhydride is completed with the elimination of water to produce the resin in its more stable form, from which it can be easily converted by additional heating to the final infusible, insoluble state".

Claim 2, which is typical, is thus worded:

> 2. A new composition of matter comprising glyptal and a drying oil incorporated as an indistinguishable mixture, said composition being viscous and sticky, soluble in organic solvents and convertible by heat to a hard, tough, infusible, insoluble condition.

The last patent which I believe apposite to mention is the United States patent No. 1,974,742, for synthetic resin and process of making same, granted to Horace H. Hopkins and Frank A. McDermott, assignors to E. I. du Pont de Nemours & Company, on September 25, 1934, pursuant to an application filed on August 14, 1926, a copy whereof was filed as exhibit W.

The invention relates to synthetic resinous condensation products of polyhydric alcohols with polybasic acids and drying oils or drying oil acids, with or without other acidic constituents, and the process of making the said products.

The patentees declare in their specification that certain resinous compositions are valuable in the plastic art, particularly for use in the manufacture of varnishes or lacquers. They say that to be desirable for this purpose a resin should have the following properties:

(*a*) Solubility in the solvents used in the varnish and lacquer industry.

(*b*) Formation with cellulose esters or ethers or drying oils, or a combination of cellulose esters or ethers and compatible modified drying oils, of a hard, durable, non-brittle film.

(*c*) Compatibility with cellulose esters or ethers or drying oils, or a combination of cellulose esters or ethers and modified drying oils compatible with the cellulose esters or ethers.

The patentees declare that natural resins are sometimes used with cellulose esters or ethers to make lacquers, but give very brittle films. They add that many synthetic resins are known but have been found to be unsatisfactory since they do not have all of the necessary properties.

They state that it is known that resinous bodies can be formed by heating a polybasic acid with one of the various polyhydric alcohols, such as glycerol, glycol, glucose, mannitol, cellulose or dextrin, although glycerol is the alcohol generally used.

They say that a brittle resin is obtained when glycerol is esterified with phthalic anhydride and that a tough elastic condensation product results when succinic, tartaric, pyrotartaric or citric acid is heated with glycerol, while the glyceride of maleic acid is a flexible, gummy, sticky material.

They state that it is also known that "less brittle and more soluble, resinous materials can be prepared by replacing part of the dibasic acid by certain monobasic acids, such as oleic, palmitic, stearic, butyric, and the acids of rosin". They point out that the mixed glyceride of phthalic and oleic acids is soluble in naphtha, turpentine and coal tar oil, while the glyceride of phthalic and butyric acids and the glyceride of phthalic and rosin acids are soluble, respectively, in acetone or mixtures of benzene and alcohol.

The patentees declare that an "object of this invention is to produce a synthetic resin having the property of hardening by absorption of oxygen at atmospheric temperature, and suited, by reason of this property, for various uses in the arts." They add that another object is "to produce a resin which is initially soluble in various organic reagents, and which, on evaporation of the solvent and hardening, becomes chemically inert and substantially insoluble". They say that a more specific object is "to provide synthetic resin compositions which are of value as protective films either alone or in combination with other film-forming ingredients".

The specification contains the following statement:

> We have discovered that if drying oil acids or drying oils are heated with a polyhydric alcohol, such as glycerol, and a polybasic acid, for example, phthalic anhydride, with or without resin acids, highly valuable synthetic resins are obtained which attain the objects set forth.

The patentees then give five examples which I do not think useful to summarize.

They declare that their new resins are well adapted for use in oil varnishes and enamels, since they are soluble in drying oils and in solvents, such as turpentine and petroleum distillates, used in thinning such compositions. They add that the durability and elasticity conferred by these resins make varnishes and enamels containing any of them of great value.

Claim 21, which seems to me typical, may be quoted:

> 21. An alkyd resin formed by the combination and condensation of a polyhydric alcohol and an organic polybasic acid and an oxidized fatty acid.

Section 61 of the Patent Act was discussed with reference to the applications filed in the period between 1921 and 1927, that is those of Weber, Ellis and Hopkins & McDermott. Section 61 was included in the statute intituled "An Act to amend and consolidate the Acts relating to Patents of Invention" and bearing the short title "The Patent Act, 1935", which came into force on August 1, 1935, by proclamation of the Governor in Council.

The provisions of subsec. 1 of sec. 61 were first partly enacted in subsec. 1 of sec. 37a, added to the Patent Act, 1923, by sec. 4 of ch. 21 of the statute 22-23 Geo. V, which later became ch. 150 of the Revised Statutes of Canada, 1927. Section 37a came into force on September 1, 1932.

Subsection 1 of sec. 37a reads as follows:

> 37a. (1) No patent or claim in a patent shall be declared invalid or void on the ground that, before the invention therein defined was made by the inventor by whom the patent was applied for, it had already been known or used by some other inventor, unless it is established either that, before the date of the application for the patent such other inventor had disclosed or used the invention in such manner that it had become available to the public, or that, before the issue of the patent, such other inventor had made an application for a patent by virtue of which he is entitled to priority or upon which conflict proceedings should have been directed.

Prior to the statute 22-23 Geo. V, ch. 21, there was no such enactment in the Patent Act. This statute followed the decision of the Privy Council in the case of *Rice* v. *Christiani and Neilsen* (1), where it was held that inventor might carry the date of his invention back and upset a Canadian patent, even though he had kept his invention secret for years. Section 37a was passed, placing a restriction on prior inventors carrying the date back unless he had disclosed or used his invention in such a manner that it had become available to the public or had, before the issue of the patent, filed an application for patent in Canada.

It was urged on behalf of defendant that the statute 22-23 Geo. V, ch. 21, does not apply as regards Weber, Ellis and Hopkins & McDermott and that the law applicable to them is the law as laid in the case of *Rice* v. *Christiani and Neilsen.* After giving the matter due consideration, I am satisfied that this contention is well founded.

Weber, Ellis and Hopkins & McDermott being prior inventors to Kienle, the latter's patent so anticipated is invalid.

It was argued for the defendant that the statute 22-23 Geo. V, ch. 21, enacted in 1932, some five years after Kienle's patent was granted, had the retroactive effect of making the said patent valid. Counsel admitted that there is no decision on that point. *Craies* on *Statute Law,* 4th edition, at pages 330 and following, expounds the doctrine that retrospective effect of a statute cannot be presumed. The doctrine and most of the earlier decisions on the subject are carefully reviewed by Mr. Justice Duff, as he then was, in the case of *Upper Canada College* v. *Smith* (2).

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(1) (1931) 48 R.P.C. 511.

(2) (1921) 61 S.C.R. 413.

At page 419 we read the following observation:

> Examples might be multiplied in which judges of very high authority have said that the intention to affect prejudicially existing rights must appear from the express words of the enactment.

Further on the learned judge supplemented his remarks by this statement:

> And even more numerous instances might be adduced of dicta enunciating the doctrine that the intention must appear from the words of the statute itself.

In the statute with which we are concerned there is no indication whatever that it is intended to apply retrospectively to patents granted before its enactment.

The three patents aforesaid use either the acids of drying oils or the oils themselves and these are all heated with glycerol and phthalic acid. These patents disclose, in my opinion, the alleged invention of Kienle.

The problem of combining the Watson Smith resin with various oils or their derivatives, particularly linseed oil, butyric acid and oleic acid, and the production of an adherent film had been solved by, among others, Arsem and Friedburg. The teachings of these men gave a chemist versed in the art the knowledge that any monobasic fatty acid could be utilized. In Arsem's specification the phrase used is "various monobasic acids" and in Friedburg's "monobasic aliphatic acid". Their patents taught further that the characteristics of the acids would be carried into the oils. I do not believe that Kienle's alleged invention has added anything essential to the inventions of Arsem and Friedburg. In the case of *Sharp & Dohme Inc.* v. *Boots Pure Drug Company Ld.* (1), there are observations of Sargant L.J., in appeal, which are, as I think, much in point (p. 182):

> It would seem, on principle, that, in the case of a patent for a substance, just as much as in that of any other patent, there must be an element, a "scintilla", of invention in connection with the process and the material, at any rate, in combination; and this would appear to be in accordance with the implications of sec. 38a of the Act of 1907, as introduced by the later Act of 1919, and with the decision of Sir Ernest Pollock as Solicitor-General in *M.'s Application* (1922) 39 R.P.C. 261. But here, for the reasons already given, there appears to have been nothing more than the verification of a process and the production of a substance both of which had already been clearly pointed out. I may add that sec. 38a is not of great importance here, for its direct operation would seem to be confined to cases where there is sufficient

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(1) (1928) 45 R.P.C. 153.

invention to justify a patent for a new substance, and, even in that case, would seem merely to limit the protection of the patent to that substance only when produced by the process claimed.

I wish also to refer to a passage of the judgment of Manton, Circuit Judge, of the Circuit Court of Appeals, second circuit, rendered on February 10, 1936, in the case of *General Electric Company* v. *Paramet Chemical Corporation* (1), containing observations which seem to me applicable in the present case (p. 498):

> While the fact, standing alone, that a number of chemists struck on the substitution independently of each other and independently of Kienle, is not sufficient to disprove invention, under these circumstances, it is sufficient to negative invention: *Ruben Condenser Co.* v. *Aerovox Corp.* 77 F. (2d) 266, 268 (C.C.A. 2); *Baker* v. *Hughes-Evans,* 270 F. 97, 99 (C.C.A. 2); *Elliott & Co.* v. *Youngstown Car Mfg. Co.,* 181 F. 345, 349 (C.C.A. 3).
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> Changed conditions in the varnish and paint trade did awaken a new interest in the alkyd resins as film-forming materials. It is shown by these contemporaneous responses to a need that any skilled chemist, familiar with the natural-resin drying-oil blends of varnish, would have no difficulty when commercial operations called therefor, in ascertaining that synthetic resin could be combined with the ordinary drying oils to form the equivalent of the old combinations. It was not this patentee who turned the art to the use of an air drying glycerol phthalate resin.
>
> There was no inventive thought in this substitution, and the patent is invalid.

The Arsem patents (exhibits A and 68) and the Howell patent (exhibit I) were issued on June 2, 1914, and would have expired on June 2, 1931. The Friedburg patent (exhibit R) was issued on December 1, 1914, and would have expired on December 1, 1931. If Kienle had applied for his Canadian patent on the alleged date of invention, to wit in 1921, and if the patent had been granted after a delay of two years and four months, which is the delay incurred for the issue of the patent on his application filed on April 4, 1927, the patent would only have had about two years and a half to run from the date of the commencement of the proceedings herein. It was getting close to the expiry of the Arsem and Friedburg United States patents when Kienle's application was filed. It may have been a clever move on the part of Canadian General Electric Company Limited not to file Kienle's application in 1921, but to wait until April 4, 1927, to

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(1) (1936) 28 U.S.P.Q. 496.

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do it. The company obviously was anxious to prolong its monopoly. Be that as it may, this does not affect the question of validity of the patent in suit.

I have reached the conclusion that the patent in suit is also invalid and void by reason of anticipation.

In view of the decision to which I have arrived concerning the invalidity of the patent due to want of invention and anticipation, I do not think necessary to deal with the validity of claims 3 and 4 relied upon by plaintiffs.

The action will accordingly be dismissed with costs against plaintiffs.

Judgment accordingly.