

UNITED STATES PATENT OFFICE.

GEORGE A. JACOBS, OF CLEVELAND, OHIO, ASSIGNOR TO THE SHERWIN-WILLIAMS COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

INSULATING COMPOUND.

1,066,499.

Specification of Letters Patent.

Patented July 8, 1913.

No Drawing.

Application filed April 8, 1907. Serial No. 366,880.

To all whom it may concern:

Be it known that I, GEORGE A. JACOBS, a citizen of the United States, resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Insulating Compounds, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

The subject matter of this my present invention is a new composition of matter that is designed specifically for use as an insulating compound for impregnating electrical coils, such as are used in the various types of electrical machinery and particularly in transformers. The requirements which such a compound must meet; are, as is well known, quite severe. Primarily, of course, the compound must have high insulating qualities, otherwise it is useless on electrical apparatus. To this must be joined an ability to withstand continued heat without decomposing or otherwise changing, while the coil insulated thereby must be rendered proof against the effects of moisture, as also, in case the coils are designed for use in transformers or the like, against the class of oils ordinarily employed in cooling transformer apparatus. It is to provide a compound that will successfully meet these and related requirements that I have devised the composition of matter, the ingredients and method of preparation of which will now be described and particularly set forth in the claims.

The following description set forth in detail one approved mode of carrying out my invention, such disclosed mode, however, constituting but one of various ways in which the principle of the invention may be used.

The manner in which I prepare my new compound is in general to take a fossil or semi-fossil gum and replace the lighter natural oils found therein with a vegetable oil, preferably linseed oil. The insulating qualities of the gum, naturally good, are in this way improved and at the same time its melting temperature and brittleness are changed, when the ingredients are properly proportioned, that the resulting composition approximates quite closely the ideal insulating compound first described.

For the gum, which is thus seen to form in effect the base of the compound I prefer to employ that variety of copal known to the trade as Manila gum. A quantity of such gum is placed in a varnish-maker's kettle and fused to five hundred and fifty to five hundred and seventy-five degrees, Fahrenheit for from ten to fifteen minutes by which time the lighter natural oils will have been driven off. Thereupon the proper amount of linseed oil is added, and the resultant mixture is maintained at a temperature of approximately five hundred and forty degrees for from two and one-half to three hours, or until the linseed oil has become thoroughly incorporated in the gum. The lowering of the temperature just previous to this second stage of the operation is conveniently made incidental to the addition of the linseed oil. During such second or latter stage in the foregoing course of preparation of the varnish, I also prefer to add a small quantity of selected gilsonite or asphaltum gum. Also a small percentage of drying oil is desirably intermingled therewith at the conclusion of such operation, the use of which in the subsequent application of the compound will be obvious.

The preferred proportions in which I employ the foregoing ingredients are approximately as follows: Of the gum thirty parts; of the oil three parts; and of the asphaltum, when used, one part; while of the drier ordinarily a quantity equal to from two to three per cent. of the amount of compound which it is being added will be found sufficient. A precise formula that I have found to work out with eminent success is made up of from one hundred and fifty to one hundred and sixty pounds of the Manila or semi-fossil gum; seventeen and seven-tenths pounds of linseed oil; and four and one-half to five pounds of the selected gilsonite or asphaltum gum; five pounds of drying oil. It will, of course, be understood that the exact period for which the several steps involved in the preparation of the varnish should continue may require to be curtailed or extended depending upon various conditions such as slight differences in the quality of the gum employed and even changes in atmospheric conditions; in other words the skill and judgment of the operator enter largely into the final determination of such

periods in the manufacture of this as in other compounds.

As has been indicated the compound herein described is designed especially for use in the impregnating process of treating electrical coils, particularly in the so called vacuum drying and impregnating process. It is especially adapted for impregnating transformer and all other coils operating in a cooling bath of mineral oils. Not only is it possessed of the necessary insulating qualities, and proof against both oil and moisture but it is chemically inert and will not attack the copper or injure the cotton incasing the same in any way even when warmed, as under operative conditions.

The compound produced as above, aside from being chemically inactive, and itself unaffected, at such operative temperatures even where these reach a maximum of two hundred degrees Fahrenheit, it nevertheless becomes quite fluid at a temperature of two hundred and seventy five degrees or slightly thereabove. It will thus be seen to have a very good penetration, enabling it to be forced thoroughly through the coils, thereby cementing the latter into solid oil and moisture proof masses which are not only impervious to any injurious substances that might harm the insulation, but which are

so strong mechanically that they cannot be injured by vibration or sudden jars and are rendered practically indestructible except from extreme over-loads.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the process herein disclosed, provided the step or steps stated by any one of the following claims or the equivalents of such stated step or steps be employed.

I therefore particularly point out and distinctly claim as my invention:

1. An insulating compound, including Manila gum and linseed oil in the proportions by weight of approximately one hundred and sixty and seventeen to eighteen, respectively.

2. An insulating compound, including Manila gum, asphaltum gum and linseed oil in the proportions by weight of approximately one hundred and sixty, four and one-half to five, and seventeen to eighteen, respectively.

Signed by me this 5th day of April, 1907.

GEORGE A. JACOBS.

Attested by—

D. T. DAVIES,

JNO. T. OBERLIN.