

# UNITED STATES PATENT OFFICE.

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ELECTRICALLY INSULATING WIRE AND OTHER ELECTRICAL CONDUCTORS.

No. 855,081.

Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, ALLEN D. WHIPPLE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Process for Electrically Insulating Wire and other Electrical Conductors, of which the following is a description.

My improved process relates to the method of insulating wire or other metallic surfaces by coating the same with a liquid or semi-liquid of such nature that when dried or baked thereon it will leave adhering thereto a layer of sufficient thickness and of suitable character to electrically insulate the same. If a single coat or layer is applied, however, it must necessarily be limited as to thickness. To overcome this the same material is sometimes employed for two or more coats to increase the thickness and thus improve insulation in that respect, or to insure a perfect layer of the material at all points on the surface of the conductor. The material usually employed is more or less soluble, however, and the succeeding coats of the same liquid material is to a considerable extent a solvent of the first coat applied, so that in any process where wire, for example, is passed through a bath of the liquid, the preceding layer or layers are impaired to a considerable extent, increasing the expense and labor. The solvent effect of the superimposed layers or coats is also liable to be more active or marked at some points than at others, resulting in an insulating coat of irregular and varying thickness. The value of insulation, however, depends largely upon securing an insulating covering of uniform thickness since a thin spot must be the weakest from an insulation standpoint, and slight use or abrasion at that point may render the entire insulation useless.

My invention has for its object the elimination of the above objectionable features in a simple and efficient manner, and to this end it consists in the novel process of accomplishing such insulation by laying on a plurality of insulating coats, each of such a nature as to be a non-solvent of the next preceding coat.

It also consists in such other improvements as are herein mentioned, and are more particularly pointed out in the claims.

In practicing my process I prefer to employ such insulating material that the usual baking step may be dispensed with, thus

cheapening the operation to a considerable extent and enabling the use of materials that would otherwise not be available. This may be accomplished by using a material that will set within a reasonably short time in the atmosphere and conducting the process in a manner that will permit such exposure. In practice I have accomplished satisfactory results by using a viscous volatile liquid that will suitably adhere to the surface of the conductor and readily dry on exposure to the atmosphere. Thus I have employed for this purpose collodion dissolved in ether to secure the proper viscosity and consistency, for the first coat, and, after this has suitably set, applying a second coat of shellac dissolved in wood alcohol to secure the proper consistency for the purpose.

In practice I prefer to use an anilin or other suitable dye of any preferred shade in the first coat as the difference in color clearly indicates when the surface of the conductor is evenly and suitably covered. However, any or all the different layers may be colored if desired. Additional layers may be added as desired to secure the required thickness of insulation, the two materials being alternated that one coat may not be dissolved or affected by the next succeeding layer. By using the materials mentioned, or their equivalents for the purpose, wire may be passed through a bath of the insulating material and thence to a suitable reel or reels which is arranged at a sufficient distance from the bath and is rotated at a speed to permit the material to substantially set before reaching the support. With the materials mentioned also the insulation is both substantially waterproof and of sufficient flexibility for the general use of conducting wires. The first coat employed need not necessarily adhere directly to the conductor wire, but should in all cases be sufficiently tenacious to serve as a covering for the wire and as a body for the superimposed layer or layers. If desired also the conductor may be covered with silk, cotton or the like previous to laying on the first coat, the steps of the process being the same as though such covering were not used. If it is preferred the process may include a baking step. In practicing my process in this manner I have secured satisfactory results by using for the first coat a mixture substantially as follows. 1 kilogram of melted elaterite, to which is added 150 cubic centimeters of previously boiled linseed oil,



5 grains of beeswax and sufficient kerosene oil to thin the mixture when cold to the desired viscosity, and, after baking the same to set it, laying on a second coat of copal or dammar varnish and drying the same as desired by passing the conductor through a drying oven. The thickness of the insulation may be increased as desired depending upon the size and use of the conductor.

10 The important feature of my invention consists in employing a plurality of coats of viscous insulating material either alone or in combination with other covering, in which each layer is allowed to set before another is applied and in which each coat or layer is a non-solvent of the next preceding coat or layer.

By the term "viscous fluid" in the claims I wish to be understood as meaning a material or mixture of materials of sufficient fluidity to spread and set evenly upon the surface of the conductor, and of sufficient adhesive qualities to suitably adhere to the surface of the conductor or to a preceding layer of insulating material during the set-

ting stage. By the term "set" in the claim's also, I wish to be understood as meaning sufficiently dried whether by baking, exposure to the air or otherwise to evenly coat the conductor and to take the next succeeding layer without injuriously affecting the preceding layer.

Having thus described my invention what I claim as new, and desire to secure by Letters Patent is:—

The process of insulating electrical conducting wires or the like consisting in coating the same with a plurality of layers of highly volatile viscous fluid insulating material in which each layer is chemically different from and a non-solvent of the preceding layer, each layer being allowed to set before another layer is applied.

In testimony whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

ALLEN D. WHIPPLE.

Witnesses:

ROY W. HILL,

CHARLES I. COBB.