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INSULATED ELECTRICAL CONDUCTOR

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This invention relates to a new kind of electrical conduit, and more particularly to an electrical conducting wire insulated with a nitrocellulose composition.

It is an object of this invention to provide an electrical conducting circuit with a nitrocellulose insulation, and, preferably, to provide a non-inflammable nitrocellulose composition therefor. It is a further object to avoid the necessity of tinning the copper or other wire prior to putting the insulation thereon, as when rubber insulation is provided on copper wire. A still further object is to provide an insulated conduit or wire with a nitrocellulose insulating composition which will be able to conduct a current of very high voltage without suffering a breakdown in the insulation at any point in the system. A still further object is to provide an insulated wire which is ozone-proof and corona-proof. A still further object is to provide such an insulating composition which will be inexpensive as compared with a rubber insulation and will not deteriorate in the course of time but will maintain itself on the wire permanently in a tough, flexible, unoxidized, and unaltered condition. Further objects will appear hereinafter.

In the preferred embodiment of the invention, a composition is provided as follows:

Nitrocellulose	26% by weight
Tricresyl phosphate	39% by weight
Gypsum	14% by weight
Zinc oxide	14% by weight
Denatured alcohol	7% by weight

This composition is formed into a plastic mass and then applied to the wire in the following manner: A suitable form of apparatus is used which will extrude the composition through a die having a circular cross-section, and the wire is passed through the center of the section or orifice as the extrusion proceeds so that the wire will be uniformly coated with the plastic mass and leave the extrusion apparatus in the center of the coating so provided thereon. The plastic dries out very rapidly, say in one hour's time, and the wire thus insulated may be immediately wound upon a reel without further handling. There will thus be provided an insulated wire having a nitrocellulose composition thereon without any intermediate tinning of the wire, and this nitrocellulose composition will be non-inflammable and will resist high voltages, as high as 18,000 volts, without rupture of the insulation. The insulation is furthermore very resistant to any change due to the atmosphere or aging, and may also be used directly for underground conduits without any other coating.

Instead of coating the wire directly, there may first be formed a hollow tube of the insulating composition by expressing or extruding it through a die having a central core so that the composition thus extruded will assume the form of macaroni, and, in fact, similar apparatus may be used. The plastic mass thus formed will dry rapidly, as aforesaid, and will require no further treatment except to slip it over the copper wire when the final assembly is made. No tinning of the copper wire is necessary in this case.

In place of the aforesaid composition, other plastic compositions may be prepared on a nitrocellulose basis, and they will preferably be provided with fire retardant materials to make the composition non-inflammable so that it will not ignite from a match or electric spark, etc. Other solvents than alcohol may be used, and other inerts than zinc oxide, while the gypsum may be replaced with equivalent inorganic salts having fire extinguishing functions and the tricresyl phosphate may be replaced with organic esters or latent solvents known in the art. Thus dibutyl phthalate may be employed as an organic ester, and cork and ochre may be used as fillers and oils may also be introduced, if desired.

By avoiding the use of rubber, no subsequent vulcanization need be performed, and thus a great deal of time and expense is saved, while a superior insulation is produced. The rapid drying of the plastic makes it possible to reel the coil almost immediately after extrusion without any further treatment or precaution. The insulation thus produced is much better than rubber insulation and is not only cheaper but will last longer and

be able to maintain as high a voltage. Since it is quite inactive chemically, it may be placed in media that would soon deteriorate rubber insulation, unless the latter were protected by some covering means. From an electrical standpoint, the insulated wire is superior to the insulated wire heretofore used in that the insulation is unaffected by ozone and the wire is substantially corona-proof. High tension wires have been made which are somewhat resistant to the action of ozone but only to a limited extent. It is therefore apparent that the aforesaid objects have been achieved and a new form of insulated electrical conduit has been provided superior to any heretofore known.

As many apparently widely different embodiments of this invention may be made without departing from the spirit thereof, it is to be understood that I do not limit myself to the foregoing example or description except as indicated in the following patent claims.

I claim:

1. An electrical conductor having upon the surface thereof a plastic, ozone- and corona-proof, non-inflammable, insulating coating of substantial thickness comprising nitrocellulose, a softener, an inert material and a fire retardant compound.

2. A high voltage electrical conductor having upon the surface thereof a plastic, ozone- and corona-proof, non-inflammable, insulating coating of substantial thickness comprising nitrocellulose, tricresyl phosphate, gypsum and zinc oxide.

3. A high voltage electrical conductor having upon the surface thereof a plastic, ozone- and corona-proof, non-inflammable, insulating coating of substantial thickness comprising 26% nitrocellulose, 39% tricresyl phosphate, 14% gypsum and 14% zinc oxide.

In testimony whereof I affix my signature.

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