Dec. 6, 1932. A. P. HINSKY 1,890,292

METHOD OF APPLYING COATINGS TO INSULATED WIRES AND THE LIKE

Filed May 3, 1932

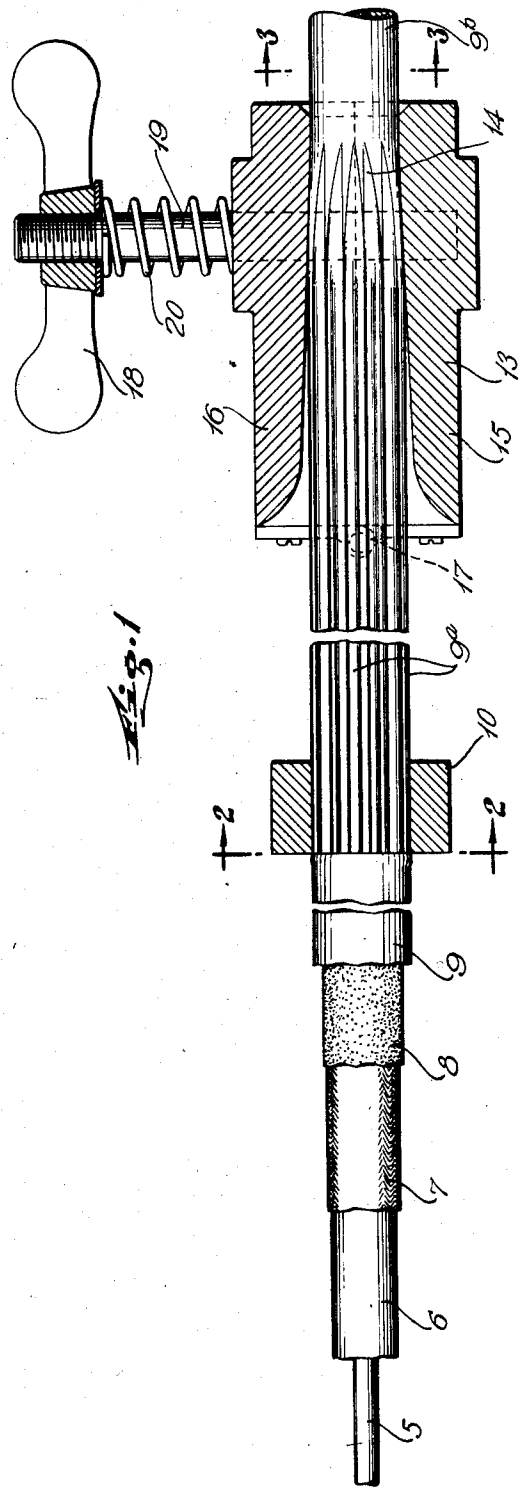


Fig. 1

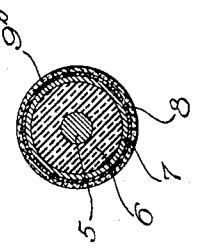


Fig. 3

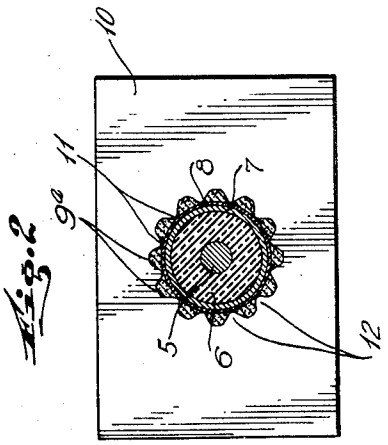


Fig. 2

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UNITED STATES PATENT OFFICE

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METHOD OF APPLYING COATINGS TO INSULATED WIRES AND THE LIKE

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This invention relates to a method of applying different kinds of coatings to strands of various kinds and classes, and particularly to insulated conductors; and the object of the invention is to provide means for centralizing the strand within a die employed for distributing a coating over the surface of the strand so as to provide on the strand a series of ribs or other protruding bodies of substantially equal thickness and with recesses disposed between said protruding bodies, said recesses opening into the strand or the surface of the strand to which the coating is applied; a further object being to provide a method of applying a coating which includes means for ironing out the protruding portions of the coating to fill up the recesses or crevices between the same to form on the finished strand a smooth coating of substantially the same thickness throughout the circumference of the strand; a further object being to provide a method of coating electric conductors in which the coating referred to is applied to a fibrous jacket treated with a saturant or other compound prior to the application of the coating thereto; and with these and other objects in view, the invention consists in a method of coating conductors and other strands which is more fully hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawing forms a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which:

Fig. 1 is a diagrammatic view illustrating the method of applying the coating to an insulated conductor;

Fig. 2 is a partial section on the line 2—2 of Fig. 1; and

Fig. 3 is a section on the line 3—3 of Fig. 1.

Heretofore, it has been customary in applying coatings of various kinds and classes to insulated conductors and other strand-like members to pass the conductor through a vat containing a compound or other coating material which would adhere to the strand, and then to pass the strand with the coating thereon through a die, wiping rolls or the like to remove the surplus, in which operation the coating would be unevenly applied to the strand. In most instances, the strand would be bare or uncoated through the length thereof along a longitudinal line or at longitudinally spaced intervals. In dealing with insulated conductors and in using flame repelling and waterproofing coatings, the coating becomes inefficient to perform the desired function by virtue of its improper application to the conductor. Still further, in applying coatings of this class of predetermined color to give color value to the conductor, the bared spots, lines or sections would also destroy the appearance of the finished product.

It is the primary object of my invention to overcome the above objectionable features in methods now employed in applying coatings of various kinds and classes regardless of the method of placing the coating on the conductor prior to the removal of the surplus thereof, which method has been by process of submerging, spraying or brushing.

For the purpose of illustrating one means of carrying my improved method into effect, I have illustrated in the accompanying drawing, the application of a coating to an insulated electric conductor. In the drawing 5 represents the wire; 6 the rubber coating; 7 the fibrous jacket; and 8 a saturant or other compound with which the jacket 7 is treated or coated, the compound 8 being preferably of a fire repellant or waterproofing character. While the compound 8 is shown as enveloping the jacket 7, it will be understood that this compound may penetrate the fibres of the jacket so that the fibres will in fact be exposed as is oftentimes the common practice. At this time, it will also be undestood that the jacket 7 may be treated with one or more compounds prior to the application of the outer coating in accordance with my improved method.

The conductor produced as above defined has applied thereto a coating 9 of any desired material, such for example as a paint, lacquer, a colored compound having a wax base or simply a wax compound or a fire repellant and/or waterproofing compound of any kind

or class, depending entirely upon the finish desired on the wire or other strand. After applying the coating 9 to the conductor, the same is passed through a die 10, which removes the surplus coating and also forms, in the construction shown, a plurality of circumferentially spaced and longitudinally arranged recesses 11 preferably exposed to the treated jacket 7 or the compound 8 thereon. Between said grooves or recesses, the coating 9 is disposed on the conductor in the form of longitudinally arranged and circumferentially spaced ribs 9*a*. In this connection, it will be understood that the circumferentially spaced and inwardly projecting teeth or ribs 12 of the die 10 rest upon the outer surface of the conductor so as to centralize the conductor in its passage through the die and to equally distribute the coating 9 on the conductor in the form of the ribs 9*a*.

After passing through the die 10, the conductor with the rib-like deposits 9*a* of the coating 9 thereon will be passed into and through an ironing or smoothing die 13, so disposed with respect to the die 10 as to allow the coating 9 to become partially set, dried or otherwise hardened so that the ribbed conductor in passing through the die 13 will have the high spots of the ribs 9*a* ironed out so that the material of the coating will flow into the recesses 11 in the manner indicated at 14 in Fig. 1, so as to produce a smooth and finished outer surface of the coating as is indicated at 9*b* in Figs. 1 and 3 of the drawing. The die 13 is preferably made of two parts 15 and 16 hinged together at the flared end of said parts as indicated at 17, the other ends of the parts being clamped together by a winged nut 18 mounted on a bolt 19 and controlling the tension of a spring 20, which bears upon the die part 16 and tensionally moves the same in the direction of the die part 15. It will be understood at this time that other forms of dies may be employed for producing the ironing out of the ribbed coated conductor so as to produce a smooth, outer coating 9*b* completely enveloping the strand and forming an even thickness of the coating on the circumference thereof. In this way, it will be understood that the coating 9 will produce on the conductor or other strand a substantially one hundred per centum efficiency in the particular character of the coating. For example, if the coating is to be of a flame repellant character, assurance of the proper treatment of the conductor is to be depended upon. This is also true in distributing the color value of a colored coating throughout the entire circumference of a length of a conductor.

After passing through the die 13, the coating 9*b* may be polished or may be treated with other coatings if desired. If a colored coating is employed in the finish 9*b* the outer coating will preferably be of a transparent nature.

It will also be understood that my invention is not necessarily limited to the application of a coating or compound to a conductor or other strand in a final or sub-final coating as the same process may be employed in applying undercoatings, for example, a coating such as 8 may be applied in the manner described after which one or more coatings may be applied thereto, and one of such additional coatings may be applied in the manner of applying the coating 9 above referred to.

It will also be understood that my invention is not necessarily limited to the ironing out of the ribbed coating 9*a* to produce the finish 9*b*, as this ribbed or otherwise characterized coating may remain as a final or subfinal coating to give predetermined design, character or trade identification to the finished product. Primarily, this feature of my invention forms the subject matter of a companion application filed of equal date herewith.

In the present case, however, it will be understood that the ribbed coating 9*b* may have another coating applied thereto, the latter filling the recesses or channels 11 between the ribs, and may be applied after the ribbed coating has become set and hardened and while the latter is in a plastic state, depending entirely upon the nature of the coating applied to the ribbed coating.

It will be understood that while I have shown, to illustrate one use of my invention, the method of applying the coating 9 to the strand or conductor in the form of a longitudinal rib that this coating may be applied in any desired form, that is to say, to give any desired form or contour to the coating on the strand, the only essential feature being that the die employed will centralize the conductor within the applied coating so as to facilitate the even distribution of the coating thereon or the even application of another coating thereto. It will also be apparent that while I have described my improved method as applied to electric conductors, that the same may be employed in the treatment of stranded bodies of any kind or class in the treatment thereof for any purpose, and various changes in and modifications of the method herein disclosed may be made within the scope of the appended claims without departing from the spirit of my invention or sacrificing its advantages.

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

1. The herein described method of applying a coating to a predetermined strand, which consists in first applying a compound coating to the strand, then passing the coated strand through a die forming substantially even deposits of the coating circumferentially of the strand and with recesses between said deposits, and then passing the strand

with the coating deposits thereon through an ironing or smoothing die for flushing the deposits into the recesses and to form a smooth outer coating of substantially the same thickness throughout the circumference of the strand.

2. The herein described method of applying a coating to a predetermined strand, which consists in first applying a compound coating to the strand, then passing the coated strand through a die forming substantially even deposits of the coating circumferentially of the strand and with recesses between said deposits, then passing the strand with the coating deposits thereon through an ironing or smoothing die for flushing the deposits into the recesses and to form a smooth outer coating of substantially the same thickness throughout the circumference of the strand, and passing the strand through the second named die while the coating material is in a semi-hard or plastic state.

3. The herein described method of applying a coating to a strand body which consists in first applying the coating to said body, then passing the coating strand into and through a member in which the strand is centralized so as to form substantially even deposits of the coating circumferentially of the strand and to form recesses on the strand intermediate said coating deposits.

4. The herein described method of applying a coating to a strand body which consists in first applying the coating to said body, then passing the coated strand into and through a die in which the strand is centralized so as to form substantially even deposits of the coating circumferentially of the strand and to form recesses on the strand intermediate said coating deposits, and then passing the strand coated as above into and through an ironing die for compressing and flushing the deposits into the recesses to form in the finished product a circumferentially continuous smooth outer coating on said strand of substantially the same thickness throughout the circumference thereof.

5. The herein described method of applying a coating to a strand body, which consists in first applying the coating to said body, then passing the coated strand into and through a die in which the strand is centralized so as to form substantially even deposits of the coating circumferentially of the strand and to form recesses on the strand intermediate said coating deposits, then passing the strand coated as above into and through an ironing die for compressing and flushing the deposits into the recesses to form in the finished product a circumferentially continuous smooth outer coating on said strand of substantially the same thickness throughout the circumference thereof, allowing the coating deposits on the strand to partially set after leaving the first die and prior to passing into and through the ironing die.

6. The herein described method of applying a colored compound coating to a strand body which consists in first applying a coating of the compound to the strand, then passing the coated strand into and through a die in which the strand is centralized and forming thereby even deposits of the colored compound on said strand with channels or recesses between said deposits, and then passing the strand with the compound deposits thereon into and through a means for ironing out or flaring the deposits into the adjoining recesses to form a smooth outer coating of substantially the same thickness through the circumference of the strand.

7. The herein described method of applying a colored compound coating to a strand body which consists in first applying a coating of the compound to the strand, then passing the coated strand into and through a die in which the strand is centralized and forming thereby even deposits of the colored compound on said strand with channels or recesses between said deposits, then passing the strand with the compound deposits thereon into and through a means for ironing out or flaring the deposits into the adjoining recesses to form a smooth outer coating of substantially the same thickness through the circumference of the strand, and then polishing or otherwise treating the coated strand to produce a glossy or polished surface.

8. The herein described method of applying a coating to insulated conductors consisting of a rubber coated wire upon which is arranged a treated fibrous jacket, which consists in applying a coating material to said jacket, then passing the conductor into and through a member removing the surplus of said coating and forming of the coating a plurality of coating deposits circumferentially spaced on the conductor with correspondingly spaced recesses therebetween.

9. The herein described method of applying a coating to insulated conductors consisting of a rubber coated wire upon which is arranged a treated fibrous jacket, which consists in applying a coating material to said jacket, then passing the conductor into and through a die removing the surplus of said coating and forming of the coating a plurality of coating deposits circumferentially spaced on the conductor with correspondingly spaced recesses therebetween, and then passing the conductor with the coating deposits thereon through a means for ironing out or flushing said deposits into the recesses to form a circumferentially continuous deposit of the coating on the conductor of substantially the same thickness throughout the circumference thereof.

10. The herein described method of applying a coating to insulated conductors con-

sisting of a rubber coated wire upon which is arranged a fibrous jacket, which consists in applying a coating material to said jacket, then passing the conductor into and through a member in which the conductor is centralized, said member forming substantially even deposits of the coating circumferentially thereof with recesses between said deposits of such depth as to expose the jacket of the conductor therethrough.

11. The herein described method of applying a coating to insulated conductors consisting of a rubber coated wire upon which is arranged a fibrous jacket, which consists in applying a coating material to said jacket, then passing the conductor into and through a die in which the conductor is centralized, the die forming substantially even deposits of the coating circumferentially thereof with recesses between said deposits of such depth as to expose the jacket of the conductor therethrough, and then treating the conductor thus formed so as to produce a smooth outer coating of substantially the same thickness throughout the circumference thereof.

12. The herein described method of applying a coating to insulate conductors so as to form a circumferentially even deposit of the coating to the conductor which consists in first applying the coating to the insulated conductor, then passing the conductor through means for centralizing the same and equalizing the deposit of the coating circumferentially of the conductor, removing the surplus coating in this operation and forming between the coating deposits recesses producing in the resulting product a predetermined design.

13. The method of coating a preformed strand which consists in applying a plurality of deposits, of even thickness, of a compound coating to the strand at circumferentially spaced intervals and leaving recesses between said deposits.

14. The method of coating a preformed strand which consists in applying a plurality of deposits of a compound coating to the strand at circumferentially spaced intervals with the deposits of even thickness, leaving recesses between said deposits and then slushing and smoothing the deposits to fill said recesses and form a smooth even thickness coating of the compound throughout the strand.

15. The herein described method of applying multiple deposits of a colored compound to a strand body which consists in providing a member through which the strand body passes, said member applying circumferentially spaced even deposits of the colored compound on said strand body with a plurality of channels or recesses between said deposits to produce in the finished product a coating of predetermined design and contour.

In testimony that I claim the foregoing as my invention I have signed my name this 28th day of April, 1932.

ANTHONY P. HINSKY.