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METHOD OF CONTINUOUSLY APPLYING INSULATING MATERIAL TO A STRAND

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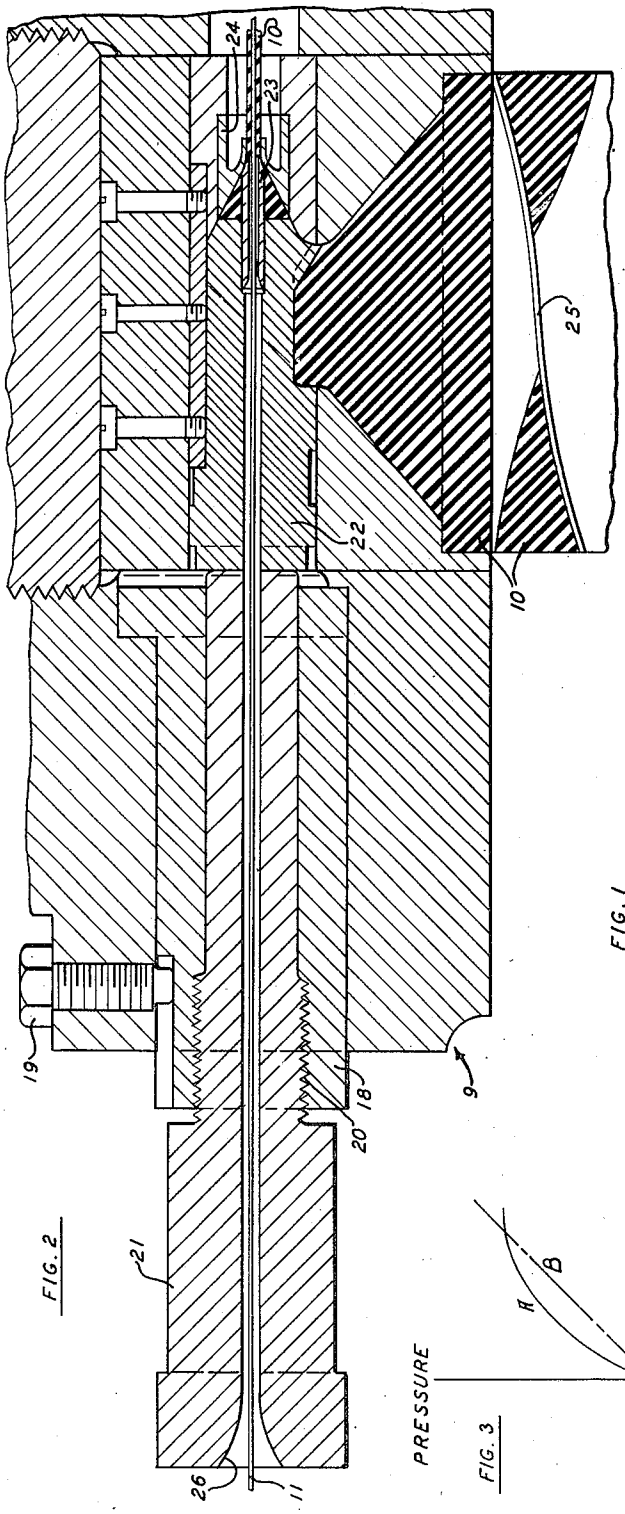

FIG. 2

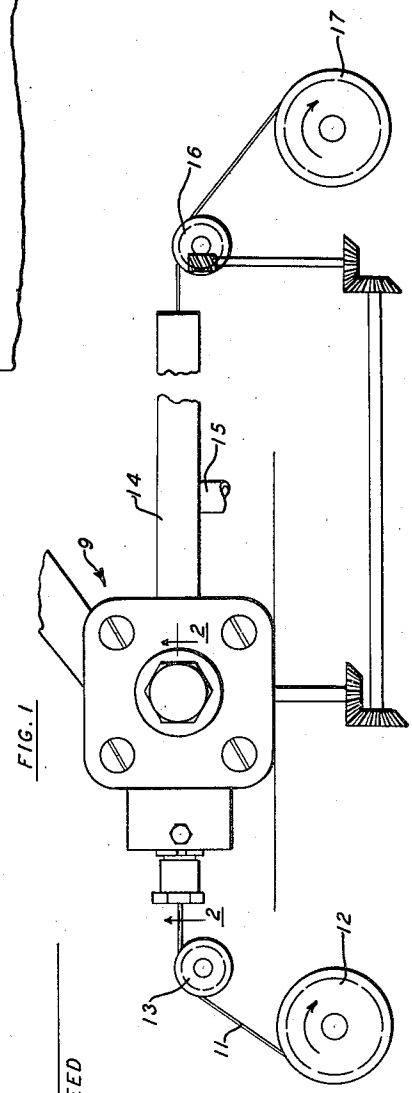

FIG. 1

FIG. 3

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METHOD OF CONTINUOUSLY APPLYING INSULATING MATERIAL TO A STRAND

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2 Claims. (Cl. 18—55)

This invention relates to a method of continuously applying insulating material to a strand, and more particularly to a method of varying the compound pressure in the insulating head of a rubber covered wire machine during the starting and stopping operations.

In insulating conductors, and particularly conductors of low tensile strength, there is in some cases a high breakage during the starting and stopping of the insulating apparatus due to the high pressure of the insulating compound, as produced by a feed screw, being extruded upon the conductor being covered. The pressure of the compound created by such a feed mechanism varies in a different ratio during starting or stopping than the speed of the wire being covered, frequently resulting in a breakage of the wire.

An object of the present invention is to provide an effective and efficient method of applying insulating compound to a strand in an extrusion apparatus.

In accordance with one embodiment of the invention, an adjustable core tube is provided whereby upon starting the extrusion or insulating operation the core tube may be moved forward to reduce the extrusion orifice in the die head so that the pressure of the compound is reduced upon the conductor. As the apparatus is reaching its operating speed, the core tube is moved back and the insulating operation is carried on as is usual. The invention will be more fully understood from the following description taken in connection with the accompanying drawing, in which—

Fig. 1 is a side elevation illustrating a form of apparatus whereby the invention may be practised;

Fig. 2 is an enlarged sectional view taken on line 2—2 of Fig. 1; and

Fig. 3 is a graph illustrating by comparative curves the relationship between the speeds of the wire to be covered and the pressures of the insulating compound.

In the drawing an insulating head 9 of an extrusion apparatus is shown adapted to apply a coating of rubber compound or other material 10 to a wire 11.

The wire is led from a supply reel 12 over a sheave 13 into the extrusion apparatus. From the extrusion apparatus the newly coated wire is led to a chamber 14 to which steam or other heating medium is admitted through an inlet 15 to vulcanize the insulating compound, the heating medium being maintained under pressure in this chamber. From the chamber the coated and vulcanized wire is led over a driven capstan 16 to a take-up reel 17.

Referring to Fig. 2, the insulating head 9 is provided with a stationary bushing 18, which is held in position by set screw 19. One end of the stationary bushing 18 is threaded as at 20 to receive an adjustable plug 21. This plug abuts against one end of a core tube holder 22, the opposite end of the core tube holder receiving and gripping the core tube 23. This core tube cooperates with a fixed die 24. The rubber compound or other insulating material 10 is forced into and around the core tube and die by means of an Archimedean feed screw 25.

In the operation of the mechanism so far described, the wire 11 is led from the supply reel 12 over a capstan 13 and is introduced into a longitudinal aperture 26 formed through the adjustable plug 21. Passing through the plug, the wire 11 enters and passes through the core tube holder, the core tube, the die and into the heating chamber 14.

It is expedient in this type of apparatus that the capstan for drawing the wire through the apparatus and the Archimedean screw for supplying the insulating material to the wire be mechanically coupled. It has been found, however, that when this is done the pressure of the insulating material due to the rotation of the feed screw rises more rapidly than the rate of speed of the wire. Referring, for instance, to Fig. 3, in which the abscissae indicate the speed of the apparatus and the ordinates indicate compound pressure, the curve A illustrates the relationship between the speed of the apparatus and the compound pressure when no adjustment is made in the core tube. The curve B indicates an ideal relationship in which the speed of the apparatus and pressure of the compound increase as a straight line function. The normal operating speed of the apparatus is at the point where the curves A and B intersect. It will be seen that with speeds lower than the normal operating speed of the apparatus, the compound pressure is too high, which in some cases results in a breakage of a wire, particularly when fine gage wire is being insulated.

It has been found possible to remedy this condition by means of the adjustable plug abutting against one end of the core tube holder to obtain a pressure speed relationship as shown in curve B. It is possible, by means of the adjustable plug, to move the core tube holder and core tube forward within certain required limits dur-

ing the starting operation, thereby reducing the orifice in the die to reduce the compound pressure while the apparatus is coming up to speed, during which time the pressure would normally be too high. As the operating speed is being reached the adjustable plug is turned counterclockwise, and the pressure of the compound will force the core tube and core tube holder backward as the plug is withdrawn.

A similar procedure is followed in bringing the apparatus to a stop.

While the invention has been described with particular reference to a process and apparatus for applying a rubber covering to wire, it will be readily understood that the apparatus, with suitable modifications, may be applied in various other relations. The scope of the invention is therefore limited only to the terms of the following claims.

What is claimed is:

1. A method of applying a rubber compound to a wire in an extrusion apparatus having a die, a core tube cooperating with said die to form a restricted extrusion orifice, a driven take-up means for drawing a wire through said core tube and die, and an Archimedean screw for delivering said compound to said extrusion orifice, which method comprises maintaining the speed ratio between said take-up means and screw constant and varying the size of the extrusion orifice to compensate for variations in the compound pressure when the speed of the screw and take-up means changes as during starting or stopping.

2. A method of applying a rubber-like compound to a wire in an extrusion apparatus having a die, a core tube cooperating with said die to form a restricted extrusion orifice, a driven take-up means for drawing a wire through said core tube and die, and a driven feeding means for said compound which produces a compound pressure disproportional to its speed, which method comprises maintaining the speed ratio of said take-up and feeding means constant, and varying the size of the extrusion orifice to compensate for the disproportionality of the compound pressure when the speed of the feeding means and take-up means changes.

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