Aug. 27, 1929. C. MARTELL ET AL 1,726,359

APPARATUS FOR APPLYING MATERIAL TO CORES

Filed June 8, 1927

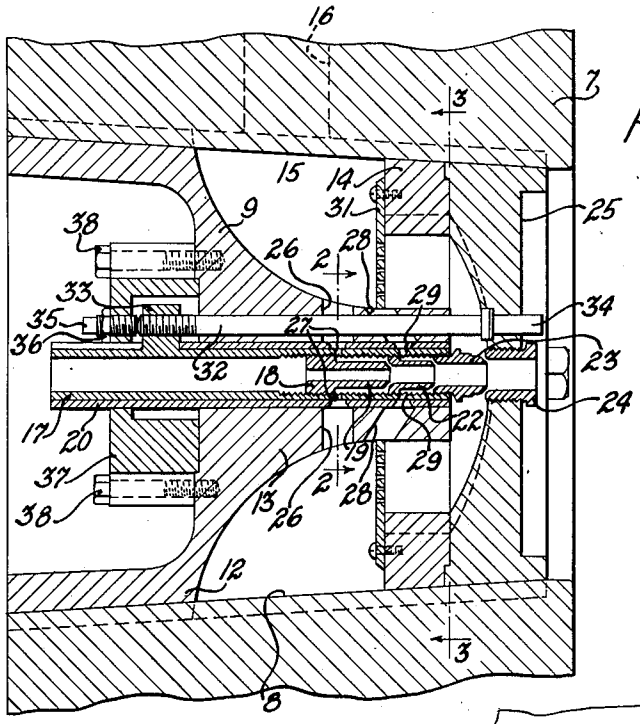


Fig. 1.

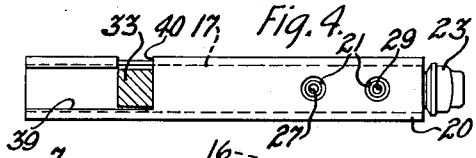


Fig. 4.

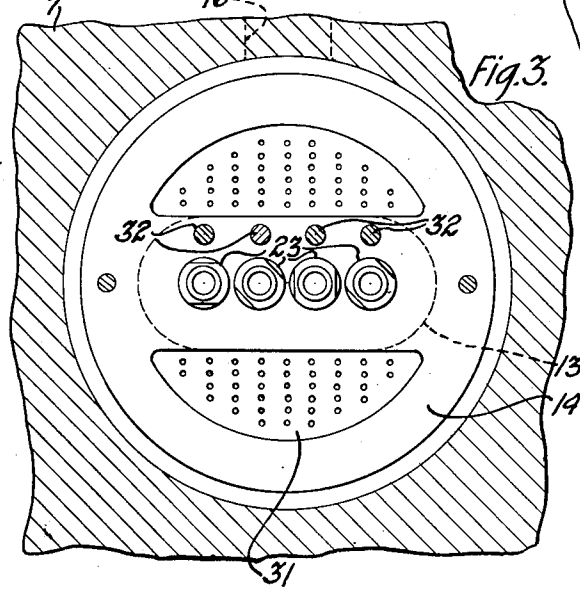


Fig. 3.

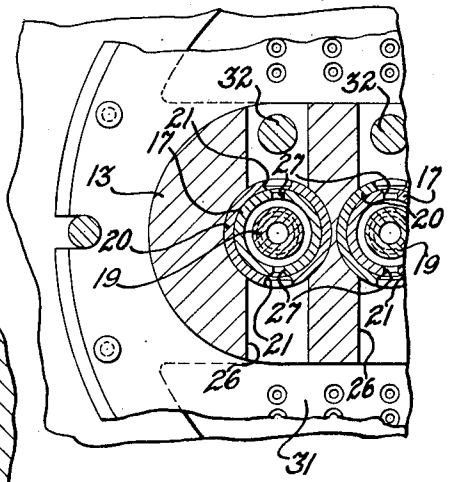


Fig. 2.

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UNITED STATES PATENT OFFICE.

CHARLES MARTELL, OF CICERO, AND BERGER AMANDUS HAGEN, OF CHICAGO, ILLINOIS, ASSIGNORS TO WESTERN ELECTRIC COMPANY, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

APPARATUS FOR APPLYING MATERIAL TO CORES.

Application filed June 8, 1927. Serial No. 197,409.

This invention relates to an apparatus for applying material to cores, and more particularly to an apparatus for simultaneously applying a plurality of layers of insulation to a conductor.

In cables, such as are used in submarine communicating systems, it is quite important that the cables be provided with insulation of a uniformly good quality both electrical and mechanical and for this reason the insulation has in some instances been applied in a plurality of layers so that if a flaw should occur in one layer the probability of it being duplicated at the same point in the other layers is very remote.

It is an object of the present invention to provide an apparatus for simultaneously applying a plurality of layers of material to a core in an efficient and expeditious manner.

The invention contemplates the provision of an apparatus in which a number of dies are compactly arranged to be fed by a single source of insulating material such as gutta percha. In accordance with one embodiment of the invention a tube is provided with a number of inserts which form the dies for applying the different layers of insulation and which may be accurately adjusted to produce the thickness of insulation desired on the respective layers.

It is believed that a complete understanding of the invention may be had by reference to the following description taken in conjunction with the accompanying drawing, in which

Fig. 1 is a fragmentary cross-sectional view of an apparatus for applying insulation to four conductors taken through the center of one of the tubular die sets;

Fig. 2 is a fragmentary sectional view taken on line 2—2 of Fig. 1;

Fig. 3 is a fragmentary sectional view taken on line 3—3 of Fig. 1, and

Fig. 4 is a detail plan view of a removable tube unit.

Referring to the drawing in which the same reference characters designate similar parts in the several views, the frame of an apparatus for separately applying three layers of insulation to each of four independent conductors is designated at 7 and is provided with a tapered opening 8 in which a die block 9 is inserted. The die block 9 comprises an annular member 12 which tapers to an elliptical shaped portion 13, and an annular member 14 which is integral with the elliptical member leaving an annularly shaped chamber 15 between the annular members in which the insulating material is contained under pressure transmitted from a source of the material (not shown) through an opening 16.

The die block 9 is provided with a number of tubular members 17 which are internally threaded and each tube is provided with three externally threaded die members 18, 22 and 23 which may be adjustably located within the tube. The first die member 18 is provided with an axial opening of just sufficient size to permit the conductor which is to be insulated to pass therethrough and is provided with a reduced portion 19 leaving an annular space between the reduced portion and the wall of the tube 17. A second similar die member 22 is axially spaced from the die member 18 and is provided with an opening of just sufficient size to permit the conductor and the first layer of insulation to pass therethrough. The unthreaded reduced portion of the die member 22 has such an external diameter as to leave an annular space between the die member and the wall of the tube. The third die member 23 is located at the end of the tube and has such an internal diameter as to permit the conductor with two layers of insulation to pass therethrough. A fourth die member 24 is located in a face plate 25 which is mounted in fixed relation to the die block. The material for the first layer of insulation passes from the annular chamber 15 through channels 26, through a pair of diametrically opposite apertures 27 into the annular space surrounding the die 18 and through the adjustable space between the dies 18 and 22. The material for the second layer of insulation passes from the annular chamber through the channels 28 into a pair of diametrically opposite apertures 29 to the annular space surrounding the die 22 and through the adjustable space between the dies 22 and 23.

It is desirable to have the third layer of insulation as uniform as possible and for this reason the insulating material is passed through a screen 31 attached to the annular member 14 of the die block before reaching the die opening between the dies 23 and 24. It will be noted that any of the die openings between the dies carried by the tube 17 may be adjusted by simply rotating the die members. In order to adjust the die opening between the dies 23 and 24, the entire tube is moved forward or backward by means of a threaded lug 33 carried by the tube which is engaged by a threaded rod 32. The position of the tube may be changed to any desired position by rotating the square head 34 of the rod 32. In order to insure that there will be no lost motion between the die block and the tube, a set screw 35 provided with a lock nut 36 is provided which engages the end of the rod 32 and holds it firmly in place.

When the operation of applying insulation is once begun it is necessary to continue the operation until the entire conductor is covered for any interruption of the process will impair the uniformity of the insulation. It sometimes happens that one conductor is completed before another and it then becomes desirable to prevent the insulating material from escaping through the dies. The opening between the dies 23 and 24 may readily be closed by moving the tube 17 forward through a rotation of the rod 32. In order to close the apertures 27 and 29 in the tube 17 a second tube 20 is superposed on the tube 17 which is provided with openings 21—21 coinciding with the apertures 27 and 29, so that the closing of the apertures 27 and 29 may be accomplished by a rotation of the tube 20. The tube 20 is provided with a longitudinal slot 39 to permit its removal from the tube 17, and a circumferential slot 40 to permit its rotation on the tube 17 without interference from the lug 33.

The tubes 17 and 20 and the die members carried thereby may be removed from the die block as a unit by removing a supporting block 37 which is attached to the die block 9 by means of screws 38 and turning the rod 32 until the lug 33 of the tube is released.

In the operation of the device, the conductor which is to be covered with the three layers of insulating material enters the tube 17 from the left, as viewed in Fig. 1, and passes through the dies 18, 22, 23 and 24, successively receiving a layer of insulation from each opening between successive die members.

It will be understood that the embodiment of the invention herein described and illustrated is merely a convenient and useful form of the invention, which is capable of many other modifications without departing from the spirit and scope of the invention.

What is claimed is:

1. In an apparatus for applying material to cores, a tubular member, and a plurality of inserts for the tubular member constituting die members and having progressively larger openings for forming successive layers of material.

2. In an apparatus for applying insulation to cores, a tubular member having a plurality of apertures for admitting insulating material, a plurality of die members for the tubular member having reduced portions which provide annular spaces connecting with the apertures in the tubular member, and means for retaining the die members in fixed adjustable relation to one another.

3. In an apparatus for applying insulation to conductors, an internally threaded tubular member, and a plurality of externally threaded die members adjustably positioned in the tubular member and having progressively increasing internal diameters to form layers of insulation of corresponding dimensions.

4. In an apparatus for applying a plurality of layers of insulation to a conductor, a tube for holding and positioning a plurality of forming dies, and means for permitting the removal of the tube from the apparatus as a unit.

5. In an apparatus for applying a plurality of layers of insulation to a conductor, a die block having a face plate, a tube provided with a plurality of die members mounted in the die block, a die member mounted in the face plate of the die block, and means for adjusting the distance of the tube and its die members with respect to the die member mounted in the face plate.

6. In an apparatus for applying a plurality of layers of insulation to a conductor, a die block provided with a plurality of channels, a tubular member slidably mounted in the die block and provided with apertures coinciding with the channels in the die block, and a plurality of die members adjustably mounted in the tubular member and adapted to be supplied with insulating material through said channels and apertures.

7. In an apparatus for applying insulation to a plurality of conductors, a die block, a plurality of tubular members in the die block for supporting die members and provided with apertures for admitting insulating material to the die members, and means for selectively closing the apertures of the tubes.

8. In an apparatus for applying insulation to a plurality of conductors, a die block, a plurality of tubular members in the die block for supporting die members and provided with apertures for admitting insulating material to the die members, a second tubular member superposed upon each of the first mentioned tubular members and having apertures coinciding therewith, and means for rotating the superposed tubular members

to close the apertures in first mentioned tubular members.

9. In an appaartus for applying insulation to a conductor, a tube for supporting die members having apertures for admitting insulating material to the die members, a second tube rotatably superposed on the first tube, a rotation of which is effective to close the apertures in the first tube, and means for rotating the superposed tube.

In witness whereof, we hereunto subscribe our names this 28th day of May, A. D. 1927.

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BERGER AMANDUS HAGEN.