Nov. 12, 1957 J. A. O'CONNOR 2,812,741

APPARATUS FOR COATING WIRE

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FIG. 1

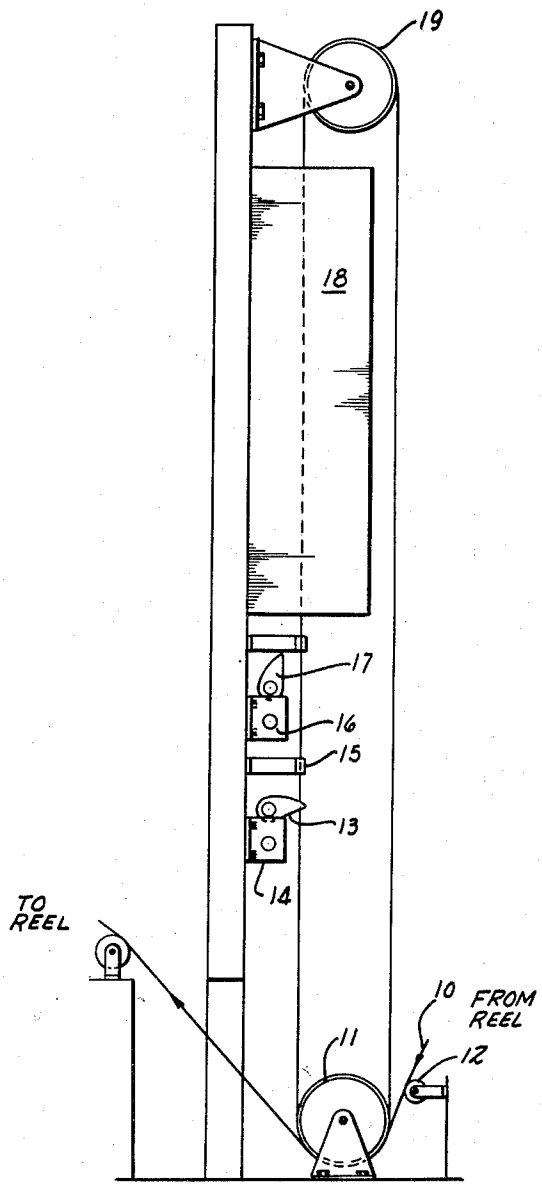
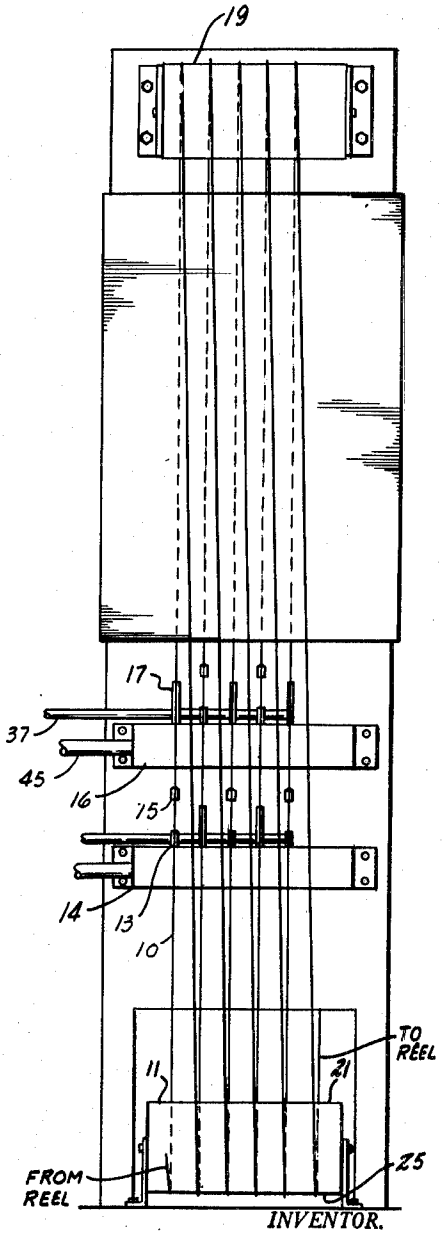


FIG. 2



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FIG. 3

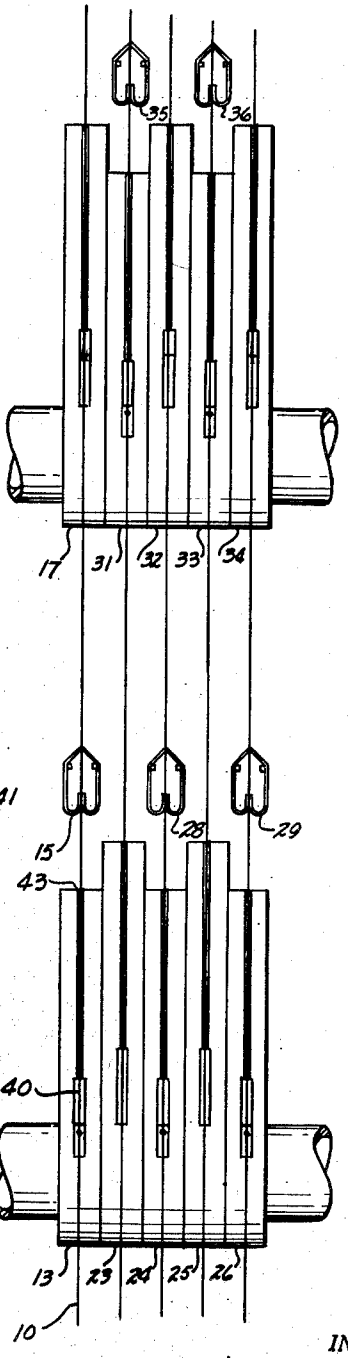
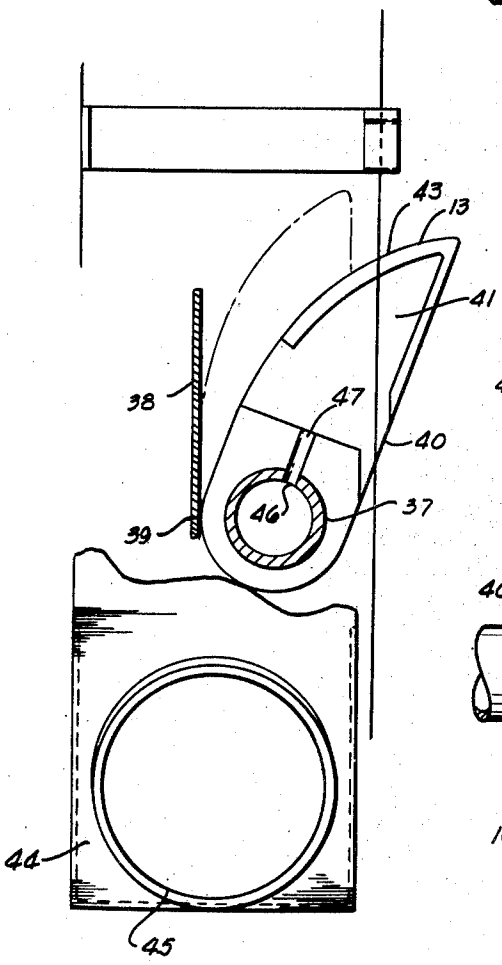


FIG. 4



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APPARATUS FOR COATING WIRE

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Application July 26, 1954, Serial No. 445,573

6 Claims. (Cl. 118—420)

This invention relates to a method and apparatus for coating wire, as for example with an enamel or varnish and has for its object the provision of improved coating apparatus for applying multi-layers of coating.

The invention provides multiple applicators arranged in a stacked manner, i. e., one above the other, to accommodate vertically moving wire which after leaving the applicators passes to vertical drying ovens. The applicators are severally constructed of moveable coating applying fingers which can be moved into or out of engagement with the vertically moving wire. The several applicators can be filled with different coating materials and as a result a variety of materials and layer combinations can be obtained.

The invention will be better understood from the following description taken in connection with the accompanying drawing and its scope will be pointed out in the appended claims.

In the drawings:

Fig. 1 is a side elevation of wire coating and drying apparatus.

Fig. 2 is a front elevation of the wire coating and drying apparatus.

Fig. 3 is an exploded front elevation of an applicator.

Fig. 4 is a cross section of an applicator taken along the plane indicated by the arrows 4—4, partially in section.

In the drawing, Fig. 1 shows a complete apparatus for applying a coating to a wire strand. Wire strand **10** is drawn from a payoff reel (not shown) and passes to the roller **11**, over pulley **12**. The stand **10** thereafter passes through an enamel applying finger **13** of the applicator **14**. The sizing die **15** removes excess coating and insures the application of a smooth, even, concentric coating. The strand of wire is shown by-passing applicator **16** and passing into the drying oven **18**.

Referring to Fig. 2, it can be noted how a strand initially enters a drying oven from roller **11** and passes over a corresponding roller **19** at the top of the oven. The strand is then progressively threaded around the rollers proceeding from left to right to exit end **21**. Thus, applicator finger **13** of applicator **14** is initially engaged with the strand, and in the adjacent following pass, applicator finger **31** of the upper applicator **16** is engaged with the strand. Succeeding alternate layers or other layer combinations of the coating materials in applicators **14** and **16** can, therefore, be obtained.

It is to be understood that any number of applicators can be used dependent upon the variety of coatings to be applied. It is to be understood that the rollers **11** and **19** can be a collection of sheaves or the like. Similarly, the applicator fingers are normally abutting, as in Fig. 3, but are here shown separated for purposes of clarity.

The baked and enameled strand **10**, in Fig. 1, exits at the top of the oven and is passed back to the oven by means of the roller **19**. The operation is repeated until the required number of coating layers are applied. The finished wire exits as in Fig. 2 to a take-up reel, not shown.

Referring now to Fig. 3, the structure of dual applicators is shown in exploded form. In this view, five strand segments of strand **10** are shown entering the dual applicators and it can be clearly seen how the strand is engaged by the different applicator fingers. Progressing from right to left, in Fig. 3, the strand **10** is coated initially with the coating material contained in finger **13**. The strand by-passes the applicator finger **17** immediately above and enters the drying oven. On the next pass, progressing to the right, the strand by-passes the applicator finger **23** which contains the same coating compound as finger **13** and is coated with the compound contained in finger **31**. The strand **10** subsequently passes through fingers **24**, **33**, **26**, bypassing fingers **32**, **25**, and **34**. Additional sizing dies **35**, **28**, **36**, and **29** are provided to remove excess coating material. Thus, the invention provides complete flexibility with respect to layering and as many different compounds can be used as desired by employing additional applicators.

Fig. 4 illustrates the passage of a strand through an applicator finger and the delivery of coating material to the finger. The applicator fingers are mounted on feed pipe **37**. The fingers rotate on the pipe **37** within the limits permitted by the backer plate **38** and the binding action of the finger against the backer plate at **39**. The strand **10** passes through the recess **40** and is coated in the cavity **41**. Clearance is provided as at **40** and **43** to permit the applicator to move into or out of coating engagement with the wire. In the retracted position, the applicator finger occupies the position illustrated by the dotted lines in Fig. 4.

In order to maintain coating characteristics and to equalize coating conditions, it is common practice to use a recirculating system. Thus, feed pipe **37** and outlet pipe **45**, also illustrated in Fig. 2, are connected to a common supply tank, not shown. Coating material is supplied, as aforesaid, to feed pipe **37**. Excess coating material drains into tank **44** and out of tank **44** through outlet pipe **45**. Feed pipe **37** has feed holes located adjacent the fingers as at **46** and coating material passes through this hole to the duct **47** and into the coating cavity **41**. It is to be noted that when the applicator finger is retracted the feed hole **46** and duct **47** move out of alinement so that the supply of coating material to the coating cavity is cut-off. Wire strand **10** passes through cavity **41**, as previously described, and is coated. Due to the velocity of the wire and consistency of the coating material, the coating material does not ordinarily pass through the recess **40**. Excess coating compound drains from the back of the applicator into the tank **44** where outlet pipe **45** returns the excess material to the supply tank.

What is claimed is:

1. A device for applying coating material to vertically moving wire strands consisting of a plurality of coating material inlet tubes in spaced vertical relation, applicator fingers mounted on said tubes, said applicator fingers further characterized by a coating chamber in communication with said coating inlet tube and inlet and outlet openings to permit the ingress and egress of a wire strand from said chamber, and means to rotate said fingers on said tubes to permit the withdrawal of said finger from coating engagement with a wire strand.

2. A device according to claim 1 further characterized in that communication between a coating chamber and a coating inlet tube is effected through a duct in an applicator finger connecting said coating chamber to a feed hole in said coating inlet tube, said duct being located relative to said feed hole such that upon rotation of said finger on said tube to permit withdrawal of said finger from coating engagement with a wire strand, said feed hole and duct move out of alinement to interrupt the flow

of coating material into said coating chamber from said coating inlet tube.

3. A device for applying coating material to vertically moving wire strands consisting of a plurality of coating material inlet tubes in spaced vertical relation, applicator fingers mounted on said tubes, said applicator fingers further characterized by two mating half sections forming a coating chamber in communication with said inlet tube and inlet and outlet openings to permit the ingress and egress of a wire strand from said chamber, said half sections facilitating the threading of wire through the applicator finger, and means to rotate said fingers on said tubes to permit the withdrawal of said finger from coating engagement with a wire strand.

4. An applicator for applying coating material to wire consisting of a coating material inlet tube, applicator fingers mounted on said tube, said applicator fingers further characterized by a coating chamber in communicating engagement with said coating inlet tube and inlet and outlet openings to permit the ingress and egress of a wire strand from said coating chamber, and means to rotate said fingers on said tubes to permit the withdrawal of said fingers from coating engagement with a wire strand.

5. An applicator according to claim 4 further characterized in that communication between a coating chamber and a coating inlet tube is effected through a duct in an applicator finger connecting said coating chamber to a feed hole in said coating inlet tube, said duct being located relative to said feed holes such that upon rotation of said finger from coating engagement with a wire strand, said feed hole and duct move out of alinement to interrupt the flow of coating material into said coating chamber from said coating inlet tube.

6. An applicator for applying coating material to wire consisting of a coating material inlet tube, applicator fingers mounted on said tube, said applicator fingers further characterized by two mating half sections forming a coating chamber in communicating engagement with said coating inlet tube and inlet and outlet openings to permit the ingress and egress of a wire strand from said coating chamber, said half sections facilitating the threading of wire through the applicator fingers, and means to rotate said fingers on said tubes to permit the withdrawal of said fingers from coating engagement with a wire strand.

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