

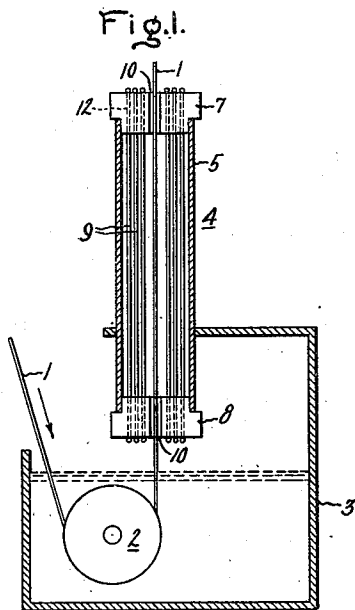
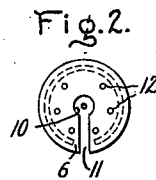
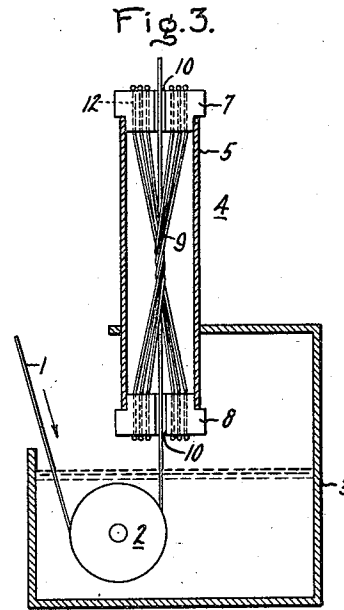
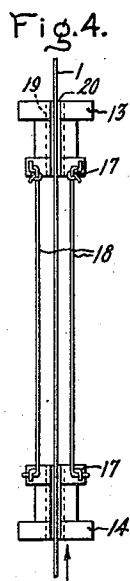
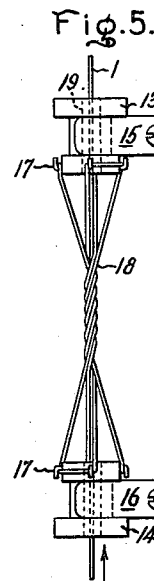
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E. J. FLYNN

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WIRE COATING DEVICE

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Inventor:
Edward J. Flynn,
by *Harry E. Dunkham*
His Attorney.

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WIRE COATING DEVICE

Edward J. Flynn, Schenectady, N. Y., assignor to
General Electric Company, a corporation of
New York

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5 Claims. (Cl. 91—53)

This invention relates to apparatus for coating elongated articles, such as wires and the like, with liquid coating compositions and more particularly is concerned with a novel wiper or wiper die by the use of which such elongated articles may be effectively and economically coated with the liquid coating compositions.

The novel features of my invention are set forth in the appended claims. The invention itself, however, will be understood more readily by reference to the following description taken in connection with the accompanying drawing wherein:

Fig. 1 is a vertical view partially in section of the essential portions of my coating device after assembly;

Fig. 2 is a top plan view of the wiper proper;

Fig. 3 is a view of the coating device resembling that of Fig. 1 by showing the wiping device ready for actual use or operation;

Fig. 4 is a modified form of the wiper; and

Fig. 5 is the same modified form in operating position.

With further reference to the drawing there is shown in Figs. 1 and 3 a somewhat schematic arrangement of the coating apparatus including my novel wiper or wiping die. The elongated article to be coated, specifically a wire 1, drawn from a pay-off reel (not shown), is passed under a guide sheave 2 immersed in a liquid coating composition contained in receptacle 3 and through the wiping device, designated broadly by reference numeral 4, and comprising a plurality of flexible strands coiled or twisted about the wire whereby the excess coating material is removed and thin, uniform film of coating material is spread over the surface of the wire. With the wiper 4 mounted above the receptacle 3 as shown, the excess coating material is free to run back into the receptacle 3. It is to be understood, however, that the invention is not limited in this respect and the wiper may be mounted at an angle or even in a horizontal plane although when so mounted, it may be necessary to make some provision for taking care of the excess liquid collecting in tube 5.

In one modification, wiper 4 in Figs. 1 and 3 may comprise a tube 5 of metal or equivalent material of suitable length and diameter provided with a lengthwise slit 6, that is, having a section along its length cut out to permit insertion of wire 1 as is shown more clearly in Fig. 2. Two flanged caps or disks 7 and 8, portions of which extend into and frictionally engage tube 5, are provided at each end of the tube 5 and

serve as means to support or anchor and twist a plurality of strings or other stranded material, such as strands 9, about wire 1 as will be described more fully hereinafter. Caps or disks 7 and 8, at least one of which can be rotated within tube 5, each contain centrally located openings or apertures 10 of such size as to permit the passage of wire 1 therethrough. The disks are also provided with slots 11 extending radially outward from and connected to aperture 10 to permit insertion of the wire into the aperture. An equal number of holes 12 circumferentially spaced in corresponding positions about aperture 10 are adapted to receive and hold strings or strands 9 in operating position about the wire to be coated. Obviously, in order that the wire may be inserted into the apertures in the above manner, it is necessary that all of the strings or strands 9 running between upper disk 7 and lower disk 8 be substantially parallel to one another and to wire 1 when slots 11 are in line with the lengthwise slit 6 in tube 5 as shown in Figs. 1 and 2. By this arrangement none of the strands intersect the plane defined by slots 11 to prevent wire 1 from entering apertures 10.

In Figs. 4 and 5 is shown a modified form of my invention. In this modification spool shaped members 13 and 14, rotatably held in operating position by suitably supported clamps 15 and 16, are provided with a number of hooks 17 carrying a plurality of strands 18. The wire passes through apertures 19 centrally located in spools 13 and 14, access for the wire to these apertures being obtained through slots 20 provided in the respective spools.

The strands or strings may be composed of any flexible material capable of being coiled or twisted to the degree necessary for the practice of my invention. Such materials include cotton, silk, linen, glass, or the like in a twisted, braided or other condition. Each of the plurality of strands 9 and 18 may be individually anchored in holes 12 of disks 7 and 8 or on hooks 17 or preferably, a single length of string, anchored at each end, may be threaded back and forth between the supporting disks or spools to form the plurality of strands as shown in Fig. 4. With the last mentioned method of mounting the strands, equalized tension on all strands is automatically obtained.

The operation of my wiper will be described with particular reference to that modification shown in Figs. 1, 2 and 3. After wire 1 has been inserted into apertures 10, the caps or disks are rotated in opposite directions, or, one cap is held

stationary while the other is rotated, until the desired twist and tension of strands 9 about the wire are obtained. The caps are thereafter held in the desired positions by frictional contact between the caps and tube 5. As the pressure exerted on the wire and hence the resultant thickness of the coating thereon is proportional to the tension on the coiled strands 9, the thickness of coating material may be controlled by suitably regulating this tension by varying the number of effective revolutions of the caps. The size of wire 1 also affects the tension on strands 9 after twisting. This factor should be taken into consideration when fixing the original length of strands 9. Other factors affecting the operating characteristics of the device are the distances between the anchoring holes 12 and the wire 1 and the effective or free length of the wiping strands arranged between caps 7 and 8.

After the wiping strands have been properly and completely twisted about the wire to encircle and contact the outer surface thereof, the wire is drawn continuously through the coating material contained in receptacle 3, wiping device 4 and then through suitable drying or baking apparatus. The excess coating material collecting below and on the twist in strands 9 flows back to receptacle 3 through aperture 10 in lower cap 8. This drainage is facilitated by the arrangement of the twisted strands in that the strands readily conduct the excess coating material away from the twisted portion.

As a result of my invention, wire may be coated with uniform continuous films of coating material. This apparatus, which is economical to construct, is particularly useful in the application of liquid coating material to elongated articles, such as wires, which previously have been provided with woven or braided fibrous coverings of fiber glass, cotton and the like as the twisted strands do not tend to abraid or otherwise injure the fibrous material as do many rigid dies or wipers. In some cases, it may be desirable to apply a layer of bonding varnish to a base wire prior to the application of glass, cotton, paper, or other fibrous coverings. By my invention, this bonding layer easily may be made so thin as to avoid any substantial penetration of the varnish into or through the overlying fibrous material. Not only can my wiper be regulated to produce films of uniform and controlled thickness on any given wire, but also any given wiper may be used in coating wires of various sizes within certain

ranges without altering its original construction.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A wiping device for removing excess liquid coating composition from a coated elongated article comprising a plurality of lengths of fibrous material, and means rotatable about said elongated article for holding and twisting the lengths of said fibrous material around the coated article so as completely to encircle and contact the outer surface thereof.

2. A wiper for removing excess liquid coating materials from coated elongated articles comprising a plurality of lengths of flexible material, means for supporting said lengths in spaced relationship around a coated elongated article, said supporting means being adapted for rotational movement about said elongated article to twist said lengths of flexible material about said elongated article to contact the outer surface thereof.

3. A device for removing excess liquid coating material from a continuous-length coated article including, in combination, a tubular support, an elongated member of flexible material arranged within said support, rotatable means arranged at opposite ends of said tubular support to which the opposite ends of said flexible material are attached, said flexible material adapted to be twisted around the continuous-length article so that it completely encircles and bears against the outer surface thereof to remove the excess coating material from the article as it is continuously drawn therethrough.

4. In a wire coating apparatus, a wiper for removing excess coating material from a moving coated wire, said wiper comprising a plurality of flexible strands twisted about said wire, rotatable means for supporting said flexible strands, said rotatable supporting means having centrally located openings therein adapted to receive said coated wire and having a slot extending outwardly from said opening through which said wire may be inserted into said opening.

5. In a wire coating apparatus, a wiper for removing excess liquid coating material from a moving coated wire and applying a thin uniform coating thereto, said wiper comprising a plurality of flexible strands twisted about one another and around said coated wire, and means rotatable about said coated wire for supporting said flexible strands in their twisted position.

EDWARD J. FLYNN.