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APPARATUS FOR PAINTING SURFACES

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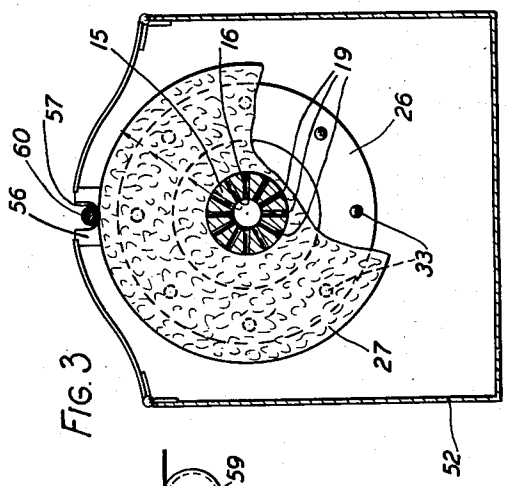


FIG. 3

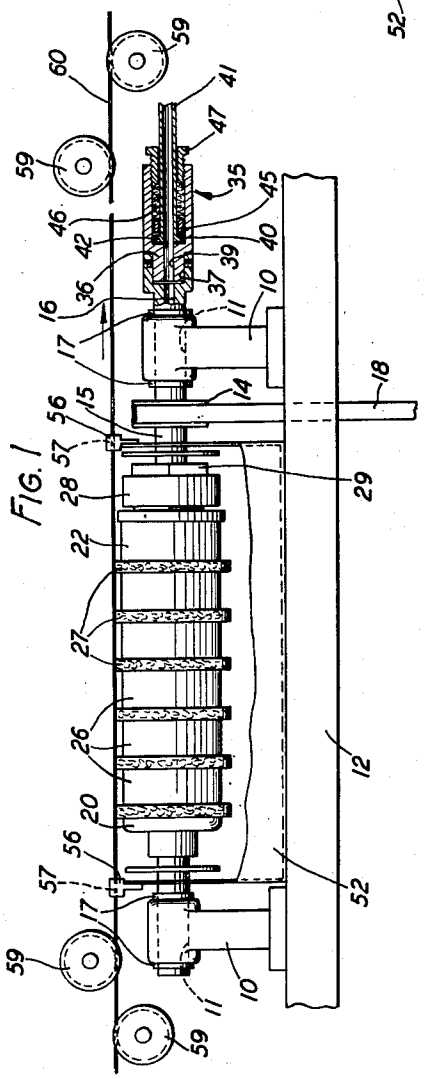


FIG. 1

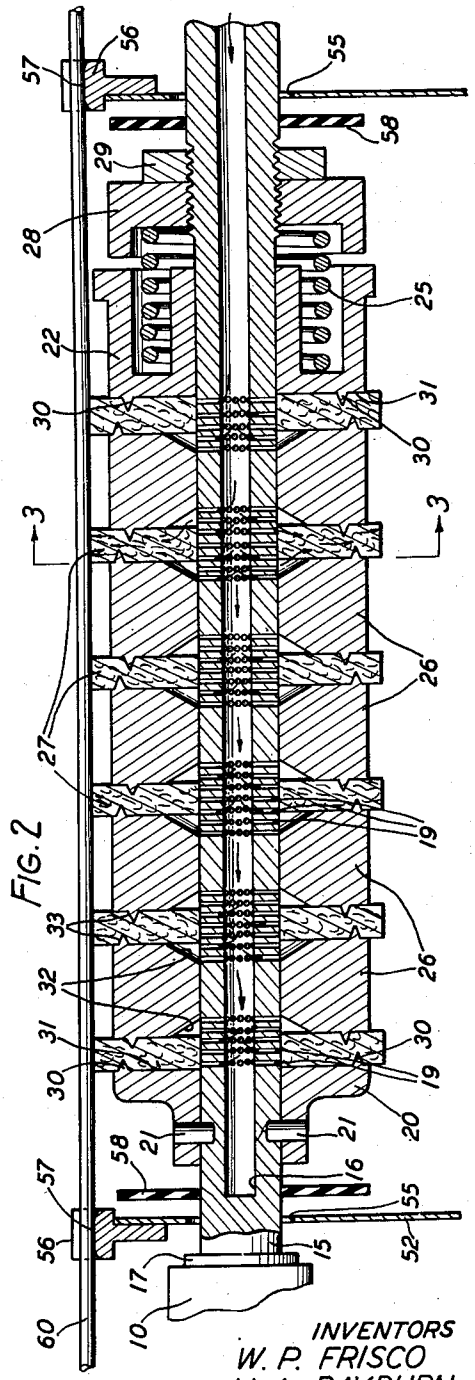


FIG. 2

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APPARATUS FOR PAINTING SURFACES

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10 Claims. (Cl. 91—12)

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This invention relates to apparatus for painting surfaces, and more particularly to apparatus for coloring or striping moving insulated conductors for identification purposes.

In the manufacture of insulated conductors it is necessary to affix some means of identification to such of the conductors that are to be used for certain purposes which require them to be easily identified.

An object of this invention is to provide new and improved apparatus for applying coating materials to surfaces.

One device embodying the invention comprises a perforated hollow shaft, a plurality of felt discs mounted upon the perforated hollow shaft, means for spacing and compressing the discs along the shaft, means for rotating the shaft, and means for supplying a coating liquid to the interior of the hollow shaft to force the liquid through the felt discs.

A complete understanding of the invention may be obtained from the following detailed description of a specific embodiment thereof, when read in conjunction with the appended drawings, in which:

Fig. 1 is a side elevation of an apparatus embodying the invention with portions thereof broken away to show the internal construction thereof;

Fig. 2 is an enlarged vertical sectional view of the apparatus, and

Fig. 3 is a transverse section taken on line 3—3 of Fig. 2.

Referring now to the drawings, standards 10—10 (Fig. 1) having bearing passages 11—11 formed therein are secured upon a base 12 with the axes of the bearing passages 11—11 aligned. A shaft 15 having a bore 16 (Fig. 2) formed therein is rotatably secured in the passages 11—11 by collars 17—17 fastened to the shaft. The shaft 15 is also provided with radial perforations 19—19 grouped around the periphery and along the length thereof, and may be rotated through a pulley 14 by a belt 18 driven by a conventional power supplying device.

A stop 20 (Fig. 2) secured to the shaft 15 by pins 21—21 cooperates with a collar 22 slidably urged along the shaft 15 by a compression spring 25 and a plurality of disc-like spacers 26—26 to space a plurality of felt discs 27—27 over the groups of the perforations 19—19. A threaded collar 28 backed by a nut 29 serves as an abutment for the spring 25. The position of the collar 28 may be adjusted to vary the compression of the spring 25 and thereby control the

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compression of the felt discs 27—27 as desired. The stop 20 and the collar 22 are provided with annularly arranged prongs 30—30 formed on opposing faces 31—31 thereof to secure the discs 27—27 against rotation relative thereto. The spacers 26—26 have annular cut-out portions 32—32 (Fig. 2) formed therein adjacent to the periphery of the shaft 15, and are provided with annularly arranged prongs 33—33 for the same purpose as the annularly arranged prongs 30—30.

A stuffing box 35 (Fig. 1) having formed thereon a small end 36, which end 36 fits tightly into an opening 37 formed in the end of the shaft 15, is also provided with a bore 39 and an enlarged aperture 40. A tube 41 having a flange 42 formed thereon is secured in the enlarged aperture 40 by a bronze bushing 45, a packing 46 and a packing nut 47. The tube 41 is connected to a suitable source of coloring liquid maintained under pressure by a pump or other suitable means (not shown). The packing nut 47 may be threaded farther into or out of the enlarged aperture 40 to place the packing 46 under a greater or lesser compression if so desired.

A housing 52 having aligned apertures 55—55 (Fig. 2) formed therein through which the shaft 15 passes is positioned on the base 12 and encloses the felt discs 27—27. A pair of guides 56—56 having U-shaped apertures 57—57 are mounted on the top of the ends of the housing 52 in such a manner that the bottoms of the U-shaped apertures 57—57 are positioned along a line directly over the centers of and slightly below the upper peripheries of the felt discs 27—27. Splash guards 58—58 are secured to the shaft 15 adjacent to the apertures 55—55.

A plurality of grooved rollers 59—59 (Fig. 1) serve to retain the lower periphery of an insulated wire 60 in the bottoms of the U-shaped apertures 57—57 and against the peripheries of the felt discs 27—27 as the wire 60 is drawn from a conventional continuous insulating and vulcanizing machine (not shown) by any suitable wire advancing means, such as a capstan. The insulated wire 60 is formed by passing one or more conductors through an insulating and vulcanizing machine (not shown) in which a layer of insulation is applied to the wires and vulcanized by heat and pressure.

In the operation of the device described hereinabove, the insulated wire 60 is continuously drawn by a capstan (not shown) from the continuous insulating and vulcanizing machine between the grooved rollers 59—59, through the U-shaped apertures 57—57 and over the upper pe-

ripheries of the felt discs 27—27. As the insulated wire 60 is drawn across the discs 27—27 in contact therewith, the shaft 15 and the discs are rotated by the belt 18 through the pulley 14, and thus the under surface of the wire 60 is brushed by the felt discs 27—27. Meanwhile, the coloring liquid is forced under pressure through the tube 41, the bore 39, the bore 16, the perforations 19—19, the cut-out portions 32—32, and through the felt discs 27—27 to saturate the discs. The discs 27—27 filter out any coarse particles contained in the coloring liquid and the portion of the coloring liquid passing to the outer peripheries of the discs 27—27 contains no undesirably coarse particles. The coloring liquid may be composed of ink, paint, dye or other suitable coloring materials. The liquid is applied to the under surface of the insulated wire 60 by the rotating discs 27—27 which are in mutual tangential contact with the wire as the wire is drawn thereacross. The entire peripheries of the felt discs 27—27 are continuously brushed against the bottom of the wire 60 as the discs are rotated. This prevents any caking of the coloring liquid upon the peripheries of the discs which remain soft, pliable and porous. Thus, the flow of the coloring liquid to all portions of the outer peripheries of the discs is uniform and the application of the coloring liquid to the wire is in a thin line of constant width. Since the insulated wire 60 is drawn directly from the continuous insulating and vulcanizing machine, the insulation thereof is quite warm as it passes over the discs 27—27, and the coloring liquid applied thereto in the form of a thin line will be quickly dried by the heat stored in the conductor and will not be smeared.

If the wire 60 is drawn through the apparatus at a faster rate of speed, the pressure placed upon the coloring liquid may be raised to increase the flow of the coloring liquid through the discs 27—27. Thus, the coloring liquid may be applied to the wire 60 in the same quantity per unit length thereof as could be applied by previously known coating apparatus when the wire was drawn through that apparatus at a slower rate of speed. Conversely, the pressure upon the coloring liquid may be decreased to lessen the flow of the liquid when the wire 60 is drawn through the apparatus at a slower rate of speed.

Any drops of the coloring liquid 66 falling from the discs 27—27 will be collected in the housing 62 and the guards 58—58 will prevent any such drops from being thrown through the apertures 55—55.

Spacers similar to the spacers 26—26 but of a different thickness from that of the spacers 26—26 may be substituted for those spacers for positioning the discs 27—27 at different positions along the shaft 15.

The porosity of the felt discs 27—27 may be closely controlled by controlling the compression of the spring 25 by varying the positions of the collar 28 and the nut 29. Thus, the filtering actions of the discs 27—27 may be varied for use with coloring liquids having different compositions. Also felt discs similar in shape to the discs 27—27, but the texture of which may be much finer or coarser, may be substituted for the discs 27—27 to more or less thoroughly filter the coloring liquid. Consequently, any type of coloring liquids ranging from dyes to paints may be employed successfully in apparatus embodying the invention.

What is claimed is:

1. In an apparatus for coating articles, a base, standards mounted on the base, journals supported by the standards, a shaft having an axial passage formed therein and also being provided with holes leading from the passage to the external surface of the shaft, means for rotating said shaft, a plurality of absorbent discs mounted coaxially upon the shaft and disposed over the holes in the shaft, a plurality of movable spacer plates mounted on the shaft between the said discs for spacing the discs along the shaft, means for applying pressure to the spacer plates to compress the absorbent discs to hold them in predetermined alignment, guides for guiding a wire to be coated against the periphery of the aligned discs while the discs are rotated at right angles to the path of travel of the wire, and means for supplying continuously a coloring liquid under pressure to the passage.

2. In an apparatus for coating articles, a base, a plurality of standards mounted on the base, a plurality of journals supported in alignment by the standards, a shaft having a passage formed therein and also being provided with a plurality of holes leading from the passage to the external surface of the shaft, a plurality of absorbent discs on the shaft extending radially therefrom and disposed over the holes, a plurality of spacer plates mounted on the shaft in between the said discs for keeping the discs apart and in alignment with the said holes, adjustable means for resiliently compressing the absorbent discs, means for rotating the shaft and the discs thereon, means for guiding wire to be coated against the periphery of the discs, and means for supplying coloring liquid under pressure to the passage.

3. In an apparatus for coating articles, a plurality of discs of a liquid carrying material, a shaft having a passage partly therethrough and also being provided with a plurality of holes formed therein leading from the passage transversely through the shaft to the exterior thereof under and adjacent to the central portion of the discs for supplying a coloring liquid to the discs, means on the shaft for holding the discs relatively stiff and in a predetermined alignment and so formed as to facilitate the flow of the coloring liquid thereto, means for applying a pressure to said discs, means for regulating the pressure applied by the pressure applying means, means for rotating the shaft and the discs thereon, means for guiding a wire across the peripheries of the discs parallel to the axis of rotation of the shaft so as to be contacted and marked thereby, and means for supplying a coloring liquid under pressure to the passage.

4. In a coating apparatus, a hollow shaft having perforations connecting the interior and exterior portions thereof, an absorbent disc positioned on said shaft over said perforations, resilient means for compressing said disc, means movable axially of the shaft for adjusting said resilient compressing means to vary the compression of said disc, and means for continuously supplying a coating fluid to the disc through the perforations in the hollow shaft.

5. In a coating apparatus, a hollow shaft having a plurality of perforations connecting the interior and exterior portions thereof, said perforations being spaced in groups along the length of the shaft, a plurality of absorbent discs, a plurality of spacer plates, said absorbent discs and spacer plates being mounted alternately on the hollow shaft, resilient means cooperating with said spacer plates for compressing and position-

ing said discs over the groups of perforations, and means for regulating the compressing action of the last mentioned means.

6. In a coating apparatus, a hollow shaft having a plurality of perforations connecting the interior and exterior portions thereof, said perforations being spaced in groups along the length of the shaft, a plurality of absorbent discs, a plurality of movable spacer plates for spacing said discs on the shaft over the groups of perforations, means for applying a predetermined pressure to said discs, through said movable spacer plates, means for rotating said shaft and said discs therewith, means for guiding a wire along a path parallel to the axis of the shaft, means for pressing such a wire against the peripheries of the discs, and means for supplying a coloring liquid under pressure to the interior portion of said shaft.

7. In a coating apparatus, a hollow shaft having a plurality of spaced annular groups of perforations in the side-walls thereof, a plurality of absorbent discs positioned on the shaft, a plurality of spacer plates positioned between the discs for positioning the discs over the groups of perforations, resilient means for compressing the discs between the spacer plates, means for rotating the shaft and the discs, means for guiding a wire over the discs, and means for supplying a coloring liquid to the interior of the hollow shaft.

8. In a coating apparatus, a hollow shaft having a plurality of annular groups of perforations in the side-walls thereof, said groups of perforations being spaced along the length of the shaft, a plurality of absorbent discs positioned on the shaft, means for positioning the discs over the groups of perforations, resilient means for compressing the discs, means for adjusting the resilient means to vary the compression of the discs, means for rotating the shaft and the discs, and means for supplying a coloring liquid to the interior of the hollow shaft.

9. In a coating apparatus, a hollow member having a plurality of annular groups of perforations, said groups of perforations being spaced along the length of the member, a plurality of porous material discs positioned on the member, means for positioning the discs over the groups of perforations, means cooperating with the positioning means for compressing the discs, means for rotating the member and the discs, means for guiding a strand over the discs in a path parallel to the axis of rotation of the discs, and means for supplying a coloring liquid to the interior of the hollow member to apply the fluid continuously to the strand.

10. In an apparatus for applying a continuous stripe throughout the length of a rapidly moving insulated electrical conductor, a hollow rotary shaft, a plurality of perforations spaced along the shaft providing passages for a marking fluid placed under pressure in the shaft, marking discs of absorbent material spaced on the shaft over the perforations and adapted to rotate with the shaft, means for guiding a conductor over the discs, means for compressing the discs to control the porosity thereof to vary the flow of marking fluid therethrough, and means for adjusting the compressing means to obtain a continuous flow of marking fluid through the discs to give a uniform stripe along the length of the insulated conductor according to the speed of the conductor passing the marking disc.

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