July 14, 1942. L. L. WEAVER 2,289,535

POLISHING APPARATUS

Filed May 22, 1940

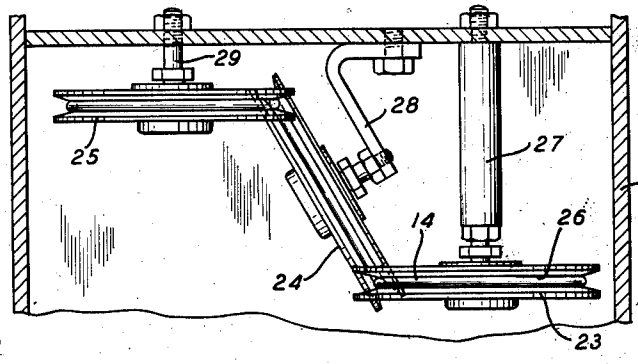


FIG. 1

FIG. 2

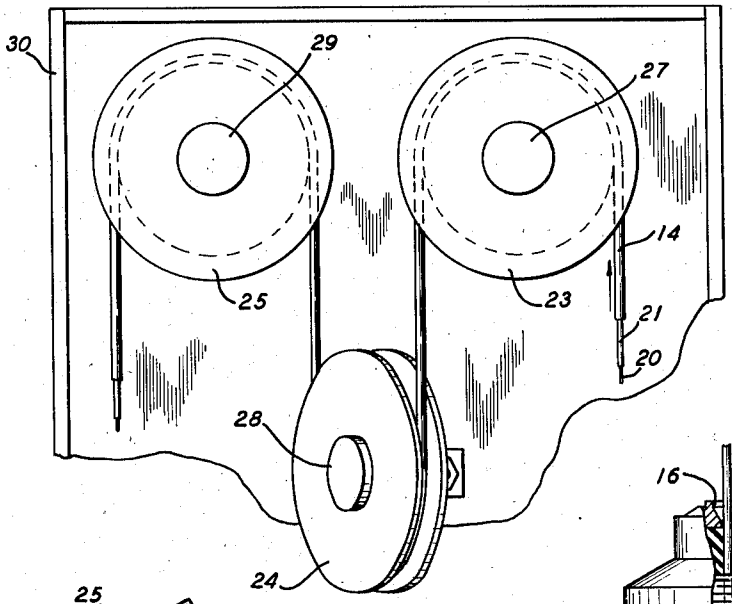


FIG. 4

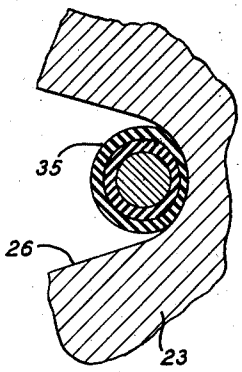


FIG. 5

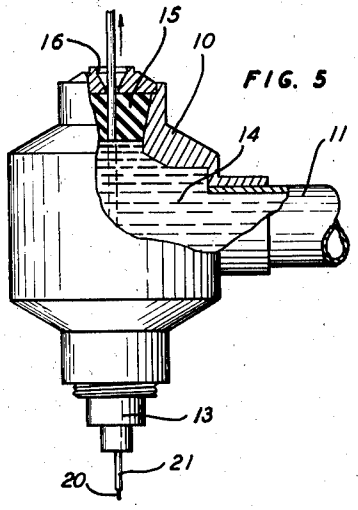
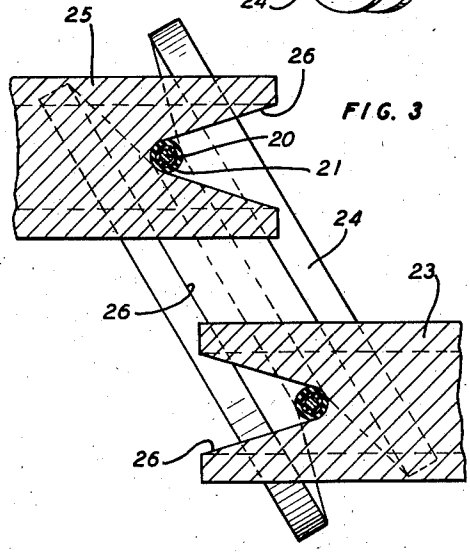


FIG. 3



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POLISHING APPARATUS

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5 Claims. (Cl. 91—48)

This invention relates to polishing apparatus, and more particularly to apparatus for polishing strands such as coated electrical conductors.

In certain electrical fields electrical conductor strands are covered with textile strands, paper pulp or other suitable insulating materials. It has been found desirable in certain instances to coat such insulated conductor strands with plastic material such as cellulose acetate, and in such instances it has been found desirable to polish the coated strands to cause the coating material to lay smoothly and uniformly thereon.

An object of the invention is to provide an apparatus which is simple in construction and highly efficient in polishing various sizes of strands.

With this and other objects in view, the invention comprises a plurality of spaced pulleys positioned with respect to each other and having their peripheries grooved to perform their respective functions in uniformly polishing their different portions of a strand passing therearound under tension.

Other objects and advantages will be apparent from the following detailed description when taken in conjunction with the accompanying drawing, wherein

Fig. 1 is a top plan view of the polishing apparatus;

Fig. 2 is a fragmentary front elevational view of the polishing apparatus;

Fig. 3 is an enlarged fragmentary horizontal sectional view of just the pulleys and the strand being polished;

Fig. 4 is an enlarged fragmentary sectional view of one of the pulleys illustrating the effect thereof on a smaller strand, and

Fig. 5 is a fragmentary detailed view illustrating one manner in which the strand may be coated.

Referring now to the drawing, attention is first directed to Fig. 5, which illustrates one form of coating the strand, and consists generally of a housing 10 communicating with a supply line 11 through which coating material such as cellulose acetate may be fed to the housing under constant pressure, so that a strand fed through an inlet 13 through the body of coating material indicated at 14 and eventually through a wiping die 15, formed of suitable material such as rubber or cork, and then through an outlet 16 may be coated with the material. The strand in the present instance has an electrical conductor core 20 (Fig. 3) having a covering of suitable insulating material such as textile strands, paper pulp or the like, indicated generally at 21. When the core 20 is covered with such materials, particularly textile strands, there are often fibers which project outwardly. The coating of such materials with a plastic material such as cellulose acetate will lay these fibers but even then it is desirable to run the coated strands through suitable means to polish the coating material, thus causing the surface to be smooth and uniform.

Attention is now directed to Figs. 1 to 4 inclusive, wherein the apparatus shown is capable of receiving the coated strand and polishing the outer surface thereof. The coated strand, if desired, may be passed directly from the coating unit shown in Fig. 5 to the coating apparatus which consists mainly of pulleys 23, 24 and 25. These pulleys are identical in construction, each having grooved peripheries, the grooves being indicated at 26, and being V-shaped in cross-section. Suitable means 27, 28 and 29 are provided to mount the pulleys in their spaced positions in a suitable housing 30, so that the pulleys may be rotated freely during the advancement of the strand through the tortuous path in advancing from the coating unit shown in Fig. 5 to a take-up reel (not shown).

It will be noted, by viewing Figs. 1, 2 and 3, that one of the pulleys is mounted angularly with respect to the others, namely the pulley 24 which extends at an angle with respect to the pulleys 23 and 25, the latter being disposed at spaced positions but parallel one with the other.

During the operation of the apparatus the strand to be polished may be advanced directly to the pulleys or through a suitable coating means illustrated in Fig. 5 and upon reaching the pulley 23 the strand will enter the V-shaped groove 26 of the pulley 23 and will ride for half the revolution of the pulley in this groove. It will be noted by viewing Fig. 3, that the grooves of the pulleys merge from the straight side walls into a joining curved wall portion. These curved portions of the grooves of the pulleys conform to the largest size of strand to be polished thereby. The strand, therefore, in passing through the groove in the pulley 23 will have substantially half its outer surface smoothed and polished and will then be directed to the pulley 24, where another portion of the surface of the strand will be polished, this portion overlapping some of the previously polished portion of the strand and including an additional unpolished portion thereof as is clearly illustrated in the lower half of Fig. 3. The strand continues in its advancement around

the lower half of the pulley **24**, where this additional portion of its surface is polished, and from the pulley **24** the strand is directed upwardly to the pulley **25**, the latter pulley polishing the remaining unpolished portion of the strand. Therefore, the strand in advancing around the pulleys, will at each pulley have a portion of its outer surface polished, and each of these polished surfaces will be overlapped with the next polishing step, so that the three portions of the surface of the strand affected by each pulley will be given an overlapping polishing treatment so that the result will be a smooth and uniform polished surface.

With this structure the grooves in the pulleys need only be of sufficient size to accommodate the largest size strand and may effectively polish strands of various sizes, that is, the various smaller sizes than that shown in Fig. 3. This is possible due to the pliable nature of the covering **21** and the fact that the strand is advanced under tension. The various means which may be used to advance the strand under tension are not shown other than the passing of the strand through the coating unit shown in Fig. 5. In addition to this, certain tension may be placed on the strand in removing the strand from a supply wheel (not shown). Therefore, as shown in Fig. 4, a smaller strand **35**, when advancing under tension, will tend to conform to the curvature of the inner curved portions of the grooves of the pulleys and due to the overlapping effect of the areas polished by each of the pulleys, the smaller strand may be efficiently polished. It will be understood that although the covering **21** is slightly compressed to cause the outer coating to conform to the curvature of the pulleys in passing therearound, the compressed portions of the covering will assume their original positions once the pressure is released, resulting in a polished strand uniform in contour.

The apparatus, therefore, provides spaced polishing pulleys over which a strand to be polished may be readily threaded without removing or adjusting any parts and which direct the strand through a tortuous path, each pulley engaging a different portion of the surface of the strand to polish and smoothly and uniformly finish its portion which overlaps portions polished by other of the pulleys, while all the pulleys are capable of readily receiving strands of various sizes to uniformly polish the outer surface thereof. Furthermore, these pulleys do not merely engage the strand tangentially but for half the circumferential distance of each pulley to more accurately polish the strand through its tension and to enable the strand to be advanced at high speed.

The embodiment of the invention herein disclosed is merely illustrative and may be modified and widely departed from in many ways without departing from the spirit and scope of the invention as pointed out in and limited solely by the appended claims.

What is claimed is:

1. An apparatus for polishing strands comprising a plurality of pulleys grooved to receive a strand to be polished while advancing under tension, and means to support the pulleys at spaced positions one angularly with respect to another to cause each pulley to engage and polish a different portion of the strand surface.

2. An apparatus for polishing strands comprising a plurality of pulleys grooved to singly receive various sizes of strands to be polished while advancing, and means to support the pulleys at spaced positions one angularly with respect to another to cause each pulley to engage and polish a different portion of the strand surface.

3. An apparatus for polishing strands comprising a plurality of pulleys having substantially V-shaped grooves to receive a strand to be polished while advancing, and means to support the pulleys at spaced positions one angularly with respect to another to cause each pulley to engage and polish a different portion of the strand surface.

4. An apparatus for polishing strands comprising a plurality of pulleys having substantially V-shaped grooves to singly receive various sizes of strands to be polished, and means to support the pulleys at spaced positions one angularly with respect to another to cause each pulley to engage and polish a different portion of the strand surface.

5. An apparatus for polishing strands comprising a plurality of pulleys grooved to receive a strand to be polished while advancing under tension, and means to support the pulleys in spaced positions to cause the strand to travel partially around one pulley in one plane and be directed to the groove of another pulley around which the strand will travel in another plane, the travel of the strand in the different planes causing polishing of different portions thereof to completely polish the strand.

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