May 1, 1934. A. P. HINSKY 1,957,212

DEVICE FOR APPLYING COATINGS TO ELECTRIC CONDUCTORS

Filed Dec. 5, 1932

Fig. 1.

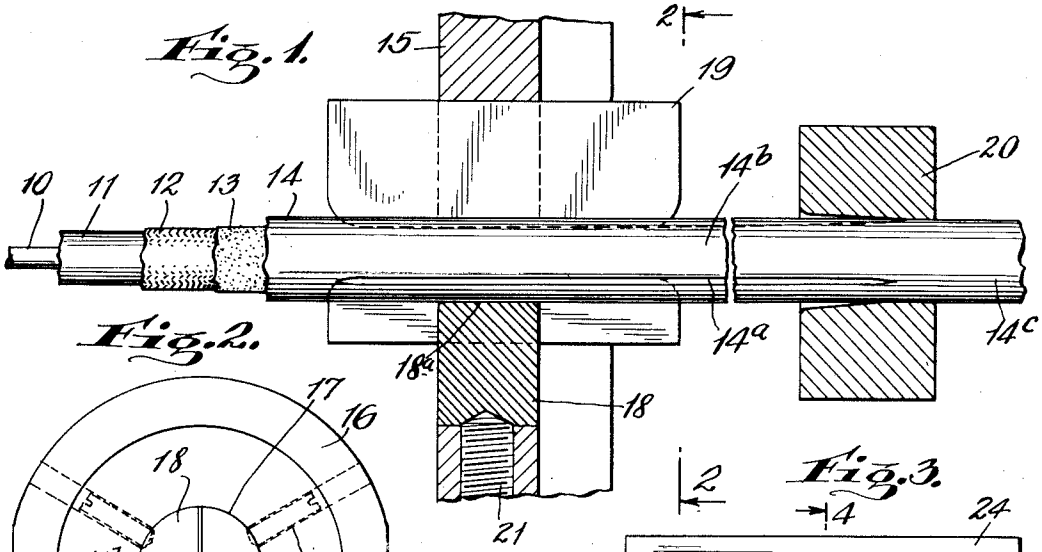


Fig. 2.

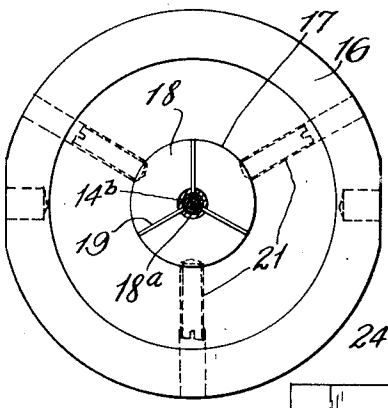


Fig. 3.

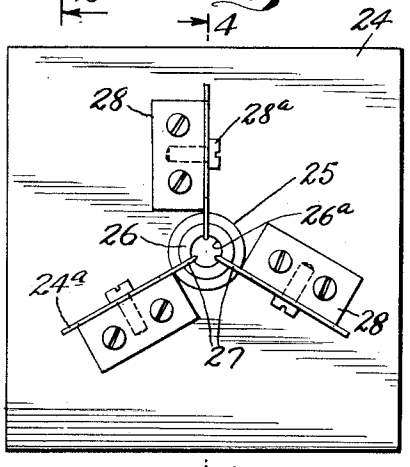


Fig. 4.

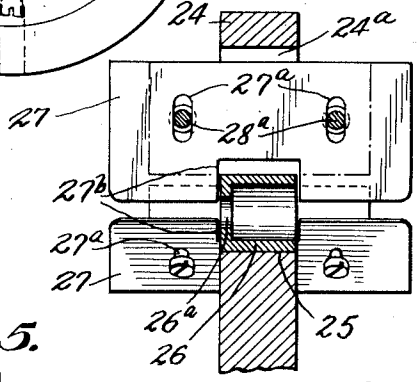


Fig. 5.

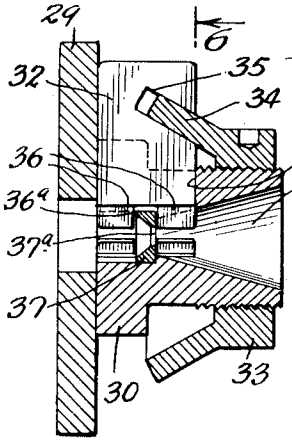


Fig. 6.

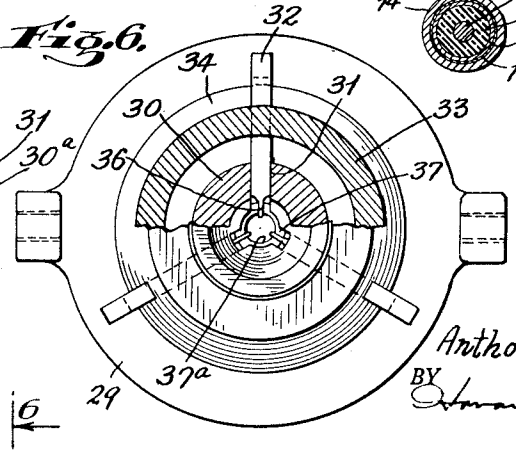
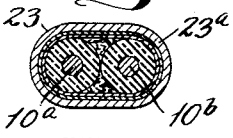


Fig. 7.

Fig. 8.



Fig. 9.



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DEVICE FOR APPLYING COATINGS TO ELECTRIC CONDUCTORS

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Application December 5, 1932, Serial No. 645,736

10 Claims. (Cl. 18—13)

This invention relates to devices for applying coatings to electric conductors; and the object of the invention is to provide a device in the form of a die or molding tool having means for centering a conductor strand therein, and other means for applying even deposits of a compound or coating to the conductor; a further object being to provide a tool of the class described wherein the centering means is adjustable so as to adapt the tool to wires of different sizes and to compensate for irregularities in wire sizes; and with these and other objects in view, the invention consists in a device of the class and for the purpose specified which is simple in construction, efficient in use, and which is constructed as hereinafter described and claimed.

The invention described and claimed herein is divisional as to certain subject matter broadly disclosed but not specifically claimed in a prior application filed by me May 3, 1932, Serial Number 608,932, which has since issued in Patent Number 1,890,292 granted December 6, 1932, of which this application constitutes a continuation in part, and is fully disclosed in the following specification, of which the accompanying drawing forms a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which:

Figure 1 is a diagrammatic, sectional view showing one of my improved devices and indicating the method of its use.

Fig. 2 is a section on the line 2—2 of Fig. 1.

Fig. 3 is a face view of a modified form of device which I employ.

Fig. 4 is a section on the line 4—4 of Fig. 3.

Fig. 5 is a transverse, sectional view through another form of device which I employ.

Fig. 6 is a side and sectional view of the device shown in Fig. 5, the section being on the line 6—6; and,

Figs. 7, 8 and 9 are sectional views of different forms of conductors which may be made according to my invention.

For the purpose of illustrating the use of my invention, I have shown in Fig. 1 of the drawing, a part of an electric conductor consisting of a wire 10, rubber jacket 11, suitable fibrous jacket of insulating material 12, which may be treated with a saturant or other composition 13. At 14, I have shown a coating compound which is first applied to the conductor and then is passed through one of my improved dies or forming devices 15. The coating 14 may be a compound of any desired character and may consist of a colored compound such as disclosed in Patent Number 1,887,851 granted November 15, 1932.

The device 15 in the construction shown is in the form of a disk or plate 16 having a large central opening 17, in which is supported a block 18 having a plurality of radially disposed centering fins 19, three of which are employed in the construction shown. These fins are in the form of thin metallic strips which are of greater length than the thickness of the plate 16 and plug 18 so as to provide long bearing surfaces which operate to straighten the wire or to remove kinks therefrom in passing through the centering device and mold.

In passing through the device, the fins 19 in engaging the conductor strand form a corresponding number of longitudinal recesses 14*a* in the coating, between which are even deposits 14*b* or deposits of even thickness, the same being formed by the bore 18*a* in the member 18 between the fins 19, it being understood that the inner ends of the fins project into the bore 18*a* to a degree governing the thickness of the deposit to be arranged upon the conductor.

After passing through the centering device and mold 15, the conductor with the deposits 14*b* thereon then enters a suitable ironing die or slushing member 20 which slushes the coating material 14*b* into the recesses 14*a* and forms on the resulting product a continuous coating 14*c* of the compound 14, which is of even or substantially even thickness throughout.

With a device of the class described, it is possible to apply compounds or other coatings to electric conductor or other strands to provide an even thickness of the coating so as to insure a complete envelopment and covering of the strand or any coatings thereon arranged immediately beneath the coating 14*c*. In other words, my improved device eliminates the application of uneven or elliptical deposits of a coating on conductor strands.

In the construction shown, the plug 18 is held in the plate 16 by means of set screws 21, and it will be understood that plugs having different bores 18*a* and different arrangement of fins 19 may be employed. In connection with the device shown in Figs. 1 and 2 as well as with the devices shown in Figs. 3 to 6 inclusive, it will be understood that the resulting product may be circular in form as seen in Fig. 7, which is consistent with the showing in Fig. 1, or the conductor may be of a triangular form as seen at 22 in Fig. 8, or of an elliptical form as seen at 23 in Fig. 9, in which latter figure, two independent conductors 10*a* and 10*b* are employed. In Fig. 8 of the drawing, the outer coating is represented at 22*a* and in Fig. 9 of the drawing, the coating is shown at 23*a*.

In Figs. 3 and 4 of the drawing, I have shown a slight modification of the construction shown in Figs. 1 and 2, and in these figures, 24 represents a plate, in the bore 25 of which is arranged a button or mold collar 26 which is cup-shaped in form and the closed side wall of which is provided

with an opening 26a which governs the size or thickness of the compound disposed on the conductor strand. In other words, the aperture 26a is equivalent to the aperture 18a.

The plate 24 is provided with three transverse apertures 24a in which are mounted centering blades or fins 27 which are adjustable radially in blocks 28 disposed on opposite sides of the plate by provided elongated apertures 27a in the blades, through which screws 28a pass for clamping the blades in different positions of radial adjustment as will be apparent. It will also be noted that the inner ends of the fins or blades 27 are cut out or recessed centrally thereof as seen at 27b to receive the button or mold member 26, and also to retain said member against lateral displacement from the plate 24. With this construction, it will be understood that different size molds or buttons 26 may be employed, that is to say, buttons having different apertures 26a therein so as to compensate the device to wires of different sizes within the limits governed by the size of the aperture 25 in the plate. In the use of the different size members 26, the fins or blades 27 are adjusted radially so as to bring their inner ends in position to engage and center the conductor in or with respect to the aperture 26a. It will appear that the fins or blades 27 are independently adjustable.

In Figs. 5 and 6 of the drawing, I have shown another modification wherein means is provided for collectively adjusting the fins or blades. In this construction, I employ a supporting plate 29, to one face of which is secured a tubular body 30 having a plurality of radial slots or grooves 31 in which fins or blades 32 are slidably and radially movable, the outer end of the body 30 being externally threaded as seen at 30a to receive a threaded collar 33, the inner end of which has an outwardly flaring flange 34 which seats in and operates in angular slots 35 formed in the fins 32. It will thus be seen that as the collar 33 is rotated on the screw 30a, the fins 32 may be drawn inwardly and outwardly depending upon the direction of rotation. The inner ends of the fins 32 are reduced and terminate in relatively thin guide fingers 36, which are of sufficient length to compensate for a reasonable degree of wear so as to render long life to the fins 32, it being understood, however, that these fins may be replaced whenever desired.

The ends 36 are divided centrally by slots 36a in which is supported a button or mold member 37, the bore 37a of which controls the diameter of the compound applied to the wire, and the inner ends 36 of the fins extend inwardly to a degree greater than the diameter of the aperture 37a as in the other forms of construction. The tubular member 30 has a large conical opening 30a which compensates for wires of different sizes used in the particular centering device and die employed. With this type of device it will be understood that an adjustment may be made during the operation of the apparatus employed for applying coatings onto the conductors so as to properly adjust the centering device to the wire and to eliminate unnecessary friction on the wire and yet insure proper alinement and centering of the wire or conductor within the aperture 37.

With the device shown in Figs. 5 and 6, it will be apparent that molds 37 of different sizes or with different size apertures therein may be employed within the limits of the device. At this time, it will also be apparent that with the different forms of construction shown, the size of the molds and centering devices will be made to suit conductors of different sizes and the mold members, and arrangement of the guide and centering fins will be such as to produce the required contour of the finished product.

From the foregoing, it will be apparent that the outstanding features of my invention reside in the provision of means involving fixed or adjustable blades or fins for centering a strand in its passage through a mold, the latter having a mold element forming between the fins or blades engaging the strand, deposits of even thickness upon the strand and arranged longitudinally and spaced circumferentially thereof, the number of deposits being governed by the number of blades employed.

At this time, it will also be understood that instead of smoothing out the deposits to form a uniform thickness of the coating as at 14c in Fig. 1 of the drawing, it will also appear that the strand may be momentarily left with the recesses or grooves therein formed by the fins or blades to facilitate the application of other or outer coatings to the strand in accordance with the teachings set forth in my prior application Serial Number 608,933, filed May 3, 1932.

It will also be understood that my invention is not necessarily limited to the application of compounds or coatings to strands of the character herein disclosed, nor am I limited to the particular structure of electric conductors as herein named. However, it will appear that in this type of conductors employing water and fireproof saturants disposed upon the jacket 12, and especially when these saturants are black in color, it is important in applying a colored coating, to equalize the distribution of the coating material 14 to provide a symmetric arrangement of the coating on the conductor as at 14c. In this connection, it will be understood that the surplus of the compound 14 is removed by the fins 19, and the outer surface of the molding element employed, and various other changes in and modifications of the construction herein shown and described may be made within the scope of the appended claims without departing from the spirit of my invention or sacrificing its advantages.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In the art of forming coated electric conductors, a mold device having a bore into and through which a conductor coated with a compound is adapted to pass, said bore forming a mold passage controlling the thickness of the compound applied to the conductor in passing through the device, means extending slightly into the mold passage at circumferentially spaced intervals for engaging and centering the conductor therein to provide even deposits of the coating on the conductor, and said means extending at opposite sides of the mold passage and longitudinally of the conductor to form relatively long bearings to straighten the conductor in its movement through said device.

2. A mold device for applying coatings to elongated strands, said device having a mold element through which the strand is adapted to pass, means for centering the strand in its passage through said element to form an even deposit of the coating on said strand to provide a deposit of the coating on the strand of even thickness circumferentially thereof, said means comprising a plurality of fins spaced circumferentially of the strand and engaging the periphery of the strand to center it with respect to said mold element, and said fins being comparatively long and extending

at opposite sides of the mold element to straighten the strand in its passage through said element.

3. A mold device for applying coatings to elongated strands, said device having a mold element through which the strand is adapted to pass, means for centering the strand in its passage through said element to form an even deposit of the coating on said strand to provide a deposit of the coating on the strand of even thickness circumferentially thereof, said means comprising a plurality of fins spaced circumferentially of the strand and engaging the periphery of the strand to center it with respect to said mold element, said fins being comparatively long and extending at opposite sides of the mold element to straighten the strand in its passage through said element, and means for adjusting said fins toward and from the strand to compensate for strands of different sizes.

4. A mold device for applying coatings to elongated strands, said device having a mold element through which the strand is adapted to pass, means for centering the strand in its passage through said element to form an even deposit of the coating on said strand to provide a deposit of the coating on the strand of even thickness circumferentially thereof, said means comprising a plurality of fins spaced circumferentially of the strand and engaging the periphery of the strand to center it with respect to said mold element, said fins being comparatively long and extending at opposite sides of the mold element to straighten the strand in its passage through said element, means for adjusting said fins toward and from the strand to compensate for strands of different sizes, and said mold element being detachable with respect to said fins whereby mold elements of different sizes may be employed to compensate for different adjustments of said fin and for strands of different sizes.

5. A mold device for applying coatings to elongated strands, said device having a mold element through which the strand is adapted to pass, means for centering the strand in its passage through said element to form an even deposit of the coating on said strand to provide a deposit of the coating on the strand of even thickness circumferentially thereof, said means comprising a plurality of fins spaced circumferentially of the strand and engaging the periphery of the strand to center it with respect to said mold element, said fins being comparatively long and extending at opposite sides of the mold element to straighten the strand in its passage through said element, means for adjusting said fins toward and from the strand to compensate for strands of different sizes, said mold element being detachable with respect to said fins whereby mold elements of different sizes may be employed to compensate for different adjustments of said fin and for strands of different sizes, and said fin adjusting means involving a single element whereby said fins are collectively adjusted.

6. A device for applying coatings of even thickness onto an elongated strand at circumferentially spaced intervals to provide on the strand intermediate said coatings recesses arranged longitudinally of the strand, said device involving a mold element and a plurality of fins spaced circumferentially of said element, the inner ends of the fins engaging the strand to center the same with respect to the mold forming passage of said element in passing therethrough, said fins forming the longitudinal recesses in the resulting product, and means for collectively adjusting said fins toward and from the center or axis of the mold element.

7. A device for applying coatings of even thickness onto an elongated strand at circumferentially spaced intervals to provide on the strand intermediate said coatings recesses arranged longitudinally of the strand, said device involving a mold element and a plurality of fins spaced circumferentially of said element, the inner ends of the fins engaging the strand to center the same with respect to the mold forming passage of said element, said fins forming the longitudinal recesses in the resulting product, and means for collectively adjusting said fins toward and from the strand, said last named means involving a member adjustably longitudinally with respect to the strand and having a part slidably engaging said fins to move said fins inwardly and outwardly in the different adjustments of said part.

8. A device for applying colored coating compounds to electric conductors treated with a saturant after the application of a colored compound to the conductor, said device having a mold element having a bore through which the conductor coated with the compound is passed, means for centering the conductor in the bore of said element in the passage of the conductor through said element, and said means producing of the compound circumferentially spaced coating deposits of even thickness throughout the circumference on said strand with recesses formed between said deposits by said centering means, and said centering means being in the form of relatively thin blades arranged longitudinally of the axis of said bore and having portions paralleling said axis and projecting at opposite sides of said element.

9. In the art of forming coated electric conductors, a mold device having a bore into and through which a conductor coated with a compound is adapted to pass, said bore forming a mold passage controlling the thickness of the compound applied to the conductor in passing through the device, means extending slightly into an area common to that of the mold passage at circumferentially spaced intervals for engaging and centering the conductor in said mold passage to provide an even deposit of the coating on the conductor, said means including a plurality of blades, means for adjusting said blades toward and from the axis of the mold passage to compensate for conductors of different sizes, and a member engaging all of said blades for collectively adjusting the same.

10. A mold device for applying coatings to elongated strands, said device having a mold element including a bore through which the strand is adapted to pass, a plurality of radially spaced members arranged at one side of the bore of said element and having relatively long inner edges extending parallel to each other and to the axis of the bore with said edges projecting slightly into the cross sectional area defined by the bore of said element to center the strand within the bore and to straighten said strand in its passage into said bore.

ANTHONY P. HINSKY.