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2,746,124

WIRE WRAPPING TOOL FOR COATED WIRE

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FIG. 1

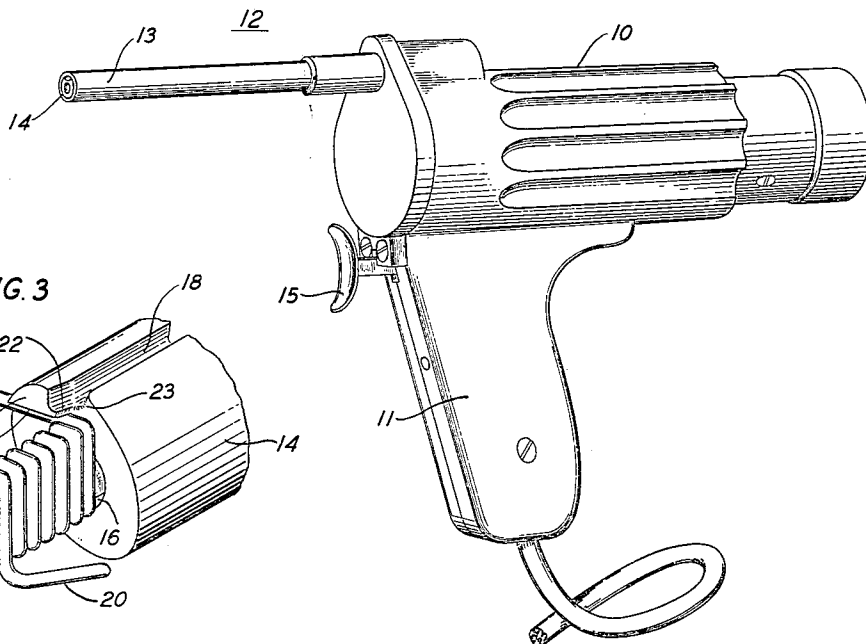


FIG. 3

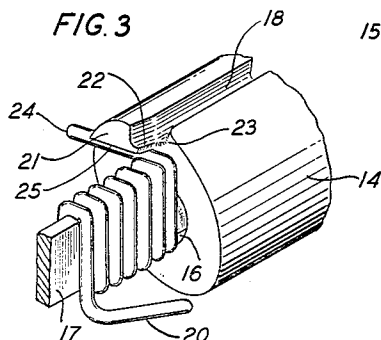


FIG. 2

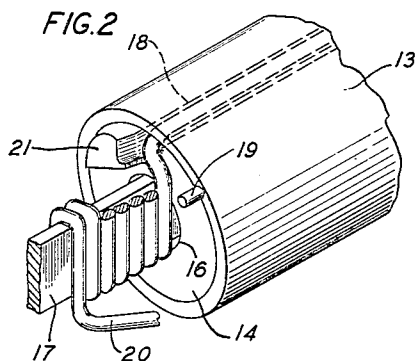


FIG. 4

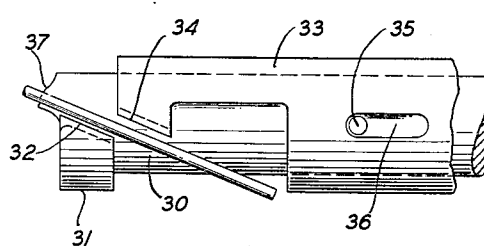
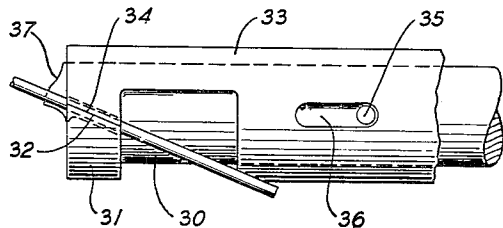


FIG. 5



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WIRE WRAPPING TOOL FOR COATED WIRE

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10 Claims. (Cl. 29—33)

This invention pertains to wiring tools and, more particularly, to such tools capable of making a wrapped wire connection on a terminal, on another wire, or a like conductor.

As is set forth more fully in the applications of Hickman-Mallina-Reck, Serial No. 753,066, filed June 6, 1947, now Patent 2,585,010, issued February 12, 1952; Mallina, Serial No. 109,308, filed August 9, 1949, now abandoned, and Mallina Serial No. 294,607 filed June 20, 1952, a good electrical connection can be made by wrapping a wire on a suitably shaped terminal or other similar conductor. These connections may be soldered where it appears desirable, but, in general, are good connections as wrapped with no need for soldering.

One form of apparatus which has been used for making wrapped connections comprises a rotatable spindle having a substantially axial opening for receiving a terminal or like conductor and an orifice radially spaced from the opening for receiving and guiding a wire that is to be wrapped on the terminal. A rounded edge having a radius suitable for the size of wire being used is located between the orifice and the terminal opening to aid in guiding the wire during wrapping. The wire receiving orifice may be, for example, a drilled hole in the spindle spaced from and substantially parallel to the terminal receiving opening, a longitudinal slot or groove in the surface of the spindle cooperating with a sleeve or other like element in which the spindle rotates, or other similar like means.

One object of this invention is to make good wrapped connections with relatively fine enameled, or similarly coated, wires.

A further object of this invention is to remove sufficient enamel from the wire during wrapping to insure good metallic contact between the wire and the terminal.

Another object is to improve a wrapped connection by smoothing down the last turn thereof.

A feature of the invention lies in a wire wrapping spindle, including an enamel removing element located with respect to the terminal opening and wire receiving orifice so that enamel is removed during the wrapping of the wire on the terminal.

Another feature resides in shaping a portion of the enamel removing element to smooth down upon the terminal the last turn of a wrapped connection.

Other and further objects and features of this invention will appear more fully and clearly from the following description of illustrative embodiments thereof, taken in connection with the appended drawings in which:

Fig. 1 is a perspective view of a wire wrapping tool equipped with a wire wrapping head in accordance with this invention;

Fig. 2 is a perspective view of the end of the wire wrapping head in use;

Fig. 3 is a perspective view similar to Fig. 2 and showing the spindle alone and in a different aspect of use;

Fig. 4 is a plan view of a modified form of spindle

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for a top loading tool, with the wire receiving slot opened; and

Fig. 5 is a similar view of the same spindle with the wire receiving slot closed to form a substantially cylindrical orifice.

As is shown in Fig. 1, the wire wrapping tool comprises a housing 10 having a handle 11, and a wrapping head 12. The wrapping head comprises a sleeve 13 in which is rotatably mounted a spindle 14. Motive means for driving the spindle is contained in the housing 10 and is controlled by the trigger 15. Any suitable motive means may be used, for example, one such as shown in the application of F. Reck, Serial No. 15,834, filed March 19, 1948, now Patent 2,649,121, issued August 18, 1953.

As may be seen in Figs. 2 and 3, the spindle 14 is provided with a substantially axial opening 16 for receiving a terminal 17. A wire receiving orifice comprises a groove 18 in the surface of the spindle 14, and the adjacent surface of the sleeve 13. The wire 20 is inserted in this orifice and held against the side of the pin 19 on the end of the sleeve 13 in preparation for wrapping.

Located on the end of the spindle 14, adjacent the groove 18 and containing a portion thereof, is a projection 21 which ordinarily will be integral with the spindle. This projection has a surface intersecting the wall of the groove 18 to form an edge 22 for scraping enamel from a wire being wrapped. Adjacent the edge 22, the end of groove 18 is rounded off as at 23 to aid in controlling the wire during wrapping.

As may be seen, particularly in Fig. 3, when the end 24 of the wire 20 comes out of the wiring slot 18, it is caught by the surface 25 of the projection 21 and smoothed down upon the terminal 17.

Fig. 2 shows how the wire 20 upon leaving the slot 18 has one portion passing over the rounded part 23 and another portion over the edge 22. Thus, that portion of the wire which is to rest against the terminal 17 has the enamel removed therefrom by the scraping edge 22.

In another embodiment of this invention as shown in Figs. 4 and 5, the spindle 30 is provided with a lateral projection 31 having an undercut face 32. Mounted on the spindle is a sleeve 33 having undercut face 34 cooperating with the face 32. The sleeve 33 is pulled back, as shown in Fig. 4, to allow the insertion of a wire and then slid forward, as in Fig. 5, to contain this wire in a substantially cylindrical orifice. The movement of the sleeve 33 may be limited by a pin 35 and a slot 36. The sleeve may be biased to closed position by a spring not shown. This form of spindle is provided with a projection 37 which is similar to the projection 21 of the previously described modification and is in other respects similar to said modification.

One advantage of the embodiment illustrated in Figs. 4 and 5 is that very fine wires may be easily inserted in the opened slot and still be suitably guided and controlled by the closed orifice.

What is claimed is:

1. A wiring tool for coated wires comprising a sleeve and a spindle mounted for rotation within said sleeve, said spindle having a substantially axial terminal receiving opening therein and having a longitudinal groove in the surface of the spindle for cooperating with the adjacent interior wall of the sleeve to define an orifice for receiving and guiding a wire to be wrapped on a terminal, a projection on the end of the spindle adjacent said groove and including an end portion of said groove, one face of said projection intersecting the bottom wall of the groove to define therewith an angular edge over which the portion of the wire which is to come in contact with the terminal is drawn during wrapping, whereby the

coating is removed from that portion of the wire, said projection having another face substantially tangent to a circle centered on the axis of rotation of the spindle for smoothing down the final end of the wire on the terminal, and means for rotating the spindle in the sleeve.

2. A wiring tool for coated wires comprising a sleeve containing a rotatable spindle, said spindle having therein a substantially axial terminal receiving opening, a groove in the spindle cooperating with the sleeve to define a wire receiving orifice, a projection on the spindle adjacent said groove and including a portion thereof, a surface of said projection intersecting the wall of said groove to define therewith an angular edge over which the wire is drawn during wrapping, whereby coating is removed from the wire, said projection having another substantially plane surface facing the terminal receiving opening for smoothing the end of the finally wrapped turn onto the terminal, and means for rotating the spindle.

3. A wire wrapping tool for coated wires comprising a rotatable spindle having a wire receiving orifice therein, a substantially axial terminal receiving opening in said spindle, a projection on the spindle between the orifice and the opening, said projection having an edge in the path of a wire to be wrapped, said edge for removing coating from the wire during wrapping, said projection also having a plane surface substantially tangent to a cylinder concentric to said opening for smoothing the final end of a wrapped wire down against the terminal on which it is being wrapped, and means for rotating the spindle.

4. A wire wrapping tool for coated wires comprising a wire wrapping head including a rotatable spindle and a sleeve surrounding the spindle; a terminal receiving opening in the spindle, a wire receiving orifice defined by a longitudinal slot in the spindle and a portion of the sleeve adjacent said slot, the outer end of said slot having a scraping edge parallel to the spindle axis and located to be in the path of a wire being wrapped, for removing the coating from the wire during wrapping, and means for rotating the spindle.

5. A wire wrapping tool for coated wire comprising a sleeve, a spindle rotatably mounted in said sleeve and provided with a substantially axial terminal receiving opening, and a wire receiving orifice radially spaced therefrom; a projection on the spindle adjacent the outer end of the orifice and including a portion thereof, said projection having a relatively sharp edge in the path of a

wire extending from the orifice to a terminal in the opening, for removing coating from the wire during its passage from the orifice to the terminal, during wrapping, said projection also having a plane surface substantially at right angles to the radius of the opening and spaced therefrom a distance slightly greater than the thickness of the wire being wrapped, for smoothing the final end of the wrapped wire onto the terminal, and means for rotating said spindle.

6. A wire wrapping head having an opening for receiving a terminal, an orifice for receiving and guiding a wire to be wrapped on said terminal, and an angular edge on said head at the outer end of said orifice and aligned therewith for removing coating from a coated wire being wrapped.

7. A wire wrapping head as in claim 6 in which the wire receiving orifice is defined by a fixed and a movable wall portion providing a laterally openable slot for receiving the wire when opened and guiding the wire when closed.

8. A wire wrapping tool for enamel coated wire that comprises a rotatable spindle, a substantially axial terminal receiving opening and a peripheral wire receiving orifice in the end of and extending into said spindle; a projection on the end of said spindle radially spaced from the opening, adjacent the orifice, and having thereon an enamel scraping edge intermediate the orifice and the opening and aligned with said orifice, and means for rotating the spindle.

9. A wire wrapping tool for enamel coated wire as in claim 8 in which the projection also includes a surface adjacent to the scraping edge and facing the terminal receiving opening for smoothing down the final end of a wrapped wire on the terminal.

10. A wire wrapping tool for enamel coated wire as in claim 8 in which the wire receiving orifice has a movable wall alternately positionable for defining a longitudinal slot for receiving the wire, or a substantially cylindrical orifice for containing the wire.

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