Oct. 1, 1957 E. BELEK ET AL 2,807,810

COMBINATION WIRE STRIPPING, CUTTING, AND WRAPPING TOOL

Filed Dec. 23, 1954

FIG. 1

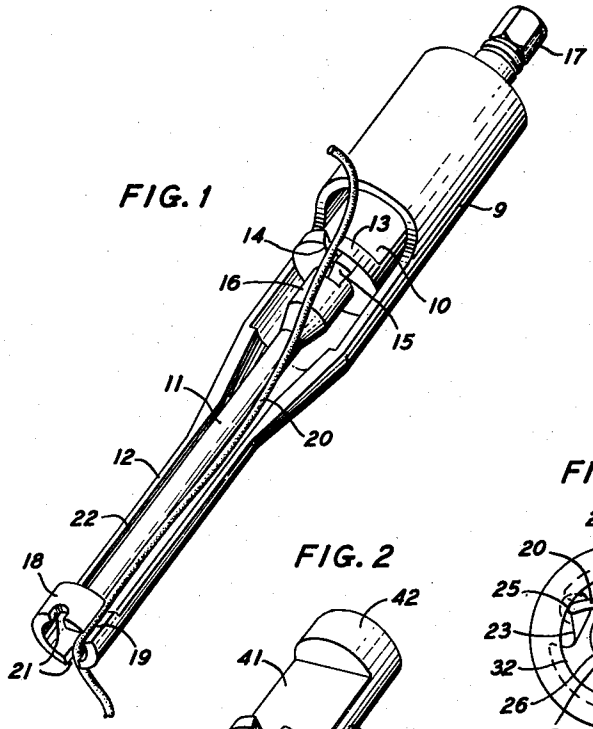


FIG. 3

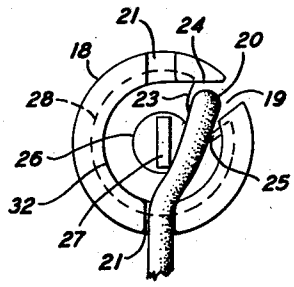


FIG. 2

FIG. 4

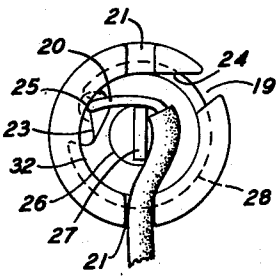


FIG. 5

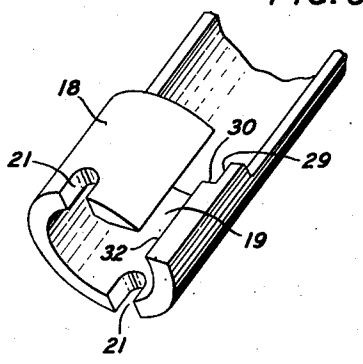
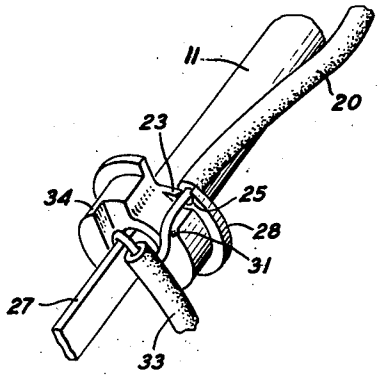


FIG. 6



INVENTORS E. BELEK
C. A. RIEDERER

BY John C. Morris

ATTORNEY

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COMBINATION WIRE STRIPPING, CUTTING, AND WRAPPING TOOL

Emil Belek, New Hyde Park, and Conrad A. Riederer, New York, N. Y., assignors to Bell Telephone Laboratories, Incorporated, New York, N. Y., a corporation of New York

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3 Claims. (Cl. 7—14.1)

This invention relates to wiring tools and more particularly to such tools including means for cutting an insulated wire to a specified length and for stripping the insulation from a portion thereof.

Devices of the general type to which this invention pertains are disclosed in the patent to H. A. Miloche, No. 2,682,063, issued June 29, 1954 and the patents to Frank Reck, No. 2,743,502, issued May 1, 1956, and No. 2,765,684, issued October 9, 1956. In the above-noted patents means for cutting the wire and for mutilating the insulation in preparation for stripping are combined with means for wrapping the stripped wire on a terminal in what is now termed a combination wire wrapping tool.

It is an object of this invention to simplify the structure of a combination wire wrapping tool and to facilitate its operation. A further object is to provide a combination tool in which all operations are performed solely by the rotation of a spindle member within a stationary sleeve.

One feature of the tool of this invention resides in the stationary sleeve member for anchoring the insulated wire. Another feature is the configuration of the sleeve member which enables passage of the insulated wire between the sleeve and spindle as the latter rotates, and further enables facile ejection of the stripped insulation.

A further feature lies in the arrangement and construction of the insulation cutting and wire guiding means.

The invention and its further features and advantages will be comprehended for clearly from the following detailed description taken in conjunction with the drawing, in which:

Fig. 1 is a general perspective view of the assembled tool with a length of insulated wire loaded preliminary to wrapping a connection;

Fig. 2 is a perspective view of the stationary cutter member;

Fig. 3 is an end view of the head of the tool showing the wire in the loaded position before the commencement of the skinning and wrapping operation;

Fig. 4 is a similar end view showing the skinning action of the tool after a partial rotation of the spindle;

Fig. 5 is a perspective view of the head end portion of the sleeve member; and

Fig. 6 is a similar view of the spindle member showing a part of a terminal member upon which a portion of the skinned wire has been wrapped.

Referring to Fig. 1, the tool of this invention consists of three cooperating members: the fixed housing or sleeve **9**, the stationary cutter member **10**, and the rotary spindle **11**. The sleeve member **9** tapers from the enlarged section containing the stationary cutter member **10** to a trough-like portion **12** and terminates in the head portion **18**. The stationary cutter member **10**, shown in Fig. 2, is a semicylindrical body fitting snugly within the sleeve **9** and fixed thereto by means of a locking screw, not shown, which may advantageously be placed in a hole through the underside of the sleeve into a tapped hole in the stationary cutter member **10**. The

stationary cutter member **10** has a circular portion **13** containing the wire cutting slot **14** and a flat portion **41** which provides a clearance space for the insulated wire inserted through the cutting slot **14**. The rearward portion **42** is cylindrical and fits snugly within the sleeve **9**. A central bore **43** through the stationary cutter member **10** provides a bearing for the spindle **11**.

Thus, the spindle **11** rotates within the center bore **43** of the stationary cutter member **10** by means of rotative effort applied to the boss **17** on the spindle shaft. As indicated above, the circular section **13** of the stationary cutter member **10** includes a cutter slot **14** having a knife edge for cooperating with the rotating cutter **15** to sever the wire **20** to a predetermined length suitable for making the wrapped connection.

The head portion **18** of the sleeve, as shown in Fig. 5, has a reduced internal diameter forming the shoulder **30**. Shown in Fig. 6 is the spindle head **34** which fits within and cooperates with the sleeve portion **18** of Fig. 5. For this purpose the collar portion **28** of the spindle head **34** of Fig. 6 engages the shoulder **30** shown in Fig. 5 and rotates within the portion **29** of the sleeve head **18**. Thus, as shown in Fig. 1 the spindle **11** is retained between the shoulder **30** and the cutter face of the stationary cutter member **10** against which the rotating cutter **15** bears.

As shown in Figs. 1, 3, 4, and 5, the sleeve head contains a loading slot **19** and two wire anchoring slots **21**. The spindle head is provided with an insulation cutter **25** in a cut-away portion of the collar **28** and a center bore **26** for receiving the terminal **27** upon which the wire is to be wrapped.

The skinning and wrapping functions of the tool of this invention are accomplished by the spindle and sleeve head portions and the cooperation of the respective parts thereof will be apparent from a description of the wrapping operation.

Preparatory to making a connection the insulated wire is loaded, as indicated in Fig. 1, with the wire portion **20** which is fed into the cutting slot **14** along the spindle, into the slot **19** of the sleeve head **18**, and into one of the anchoring slots **21**. The initial rotation of the spindle **11** results in the revolving cutter **15** forcing the wire **20** against the cutting edge **14**, severing the wire to a predetermined length. During the remainder of the spindle rotation the insulated portion **20** is carried around with the spindle **11**. For this reason the clearance space **22** between the spindle **11** and the sleeve portion **12** is sufficiently great to enable passage of the insulation therethrough.

The end view of Fig. 3 shows the relative position of the wire **20** in the loading slot **19**. As viewed from the terminal end, counterclockwise rotation of the spindle carries the insulated wire to a position between the surface **23** of the spindle head and the surface **24** of the sleeve head **18**. The slope of these surfaces is such as to force the wire into the cutting notch **25** to a position as shown in Fig. 4. As indicated in Fig. 4, the clearance between the inner wall **32** of the sleeve head and the insulation cutting surface **25** is sufficient to pass the wire but not the insulation thereon. The insulation is thereby positively forced into the cutter and crushed for a considerable portion of its circumference.

As the spindle head revolves about the stationary terminal **27** the insulated wire portion **33** of Fig. 6 is held by the anchoring slot **21**, thus drawing the free end portion **20** of the wire over the insulation cutting notch **25**, thereby skinning the wire which is then wrapped about the terminal **27**.

The facility with which a wrapped connection is accomplished by the tool of this invention will be indicated by a review of the steps involved. Loading the wire is a

readily performed operation comprising placing the wire in the anchoring slot **21**, the loading slot **19**, and the cutting notch **14**. The spindle **11** is then rotated while the sleeve **9** is held stationary. This may be accomplished by hand power or advantageously by portable power means applied to boss **17**. Rotation of the spindle cuts the wire to length, crushes the wire insulation in the cooperating means of the spindle and sleeve heads, and simultaneously withdraws the wire from its insulation sheath and wraps it around the terminal. It may be noted that where power means are used to rotate the spindle a single on-off switch suffices to control the operation of the tool. In addition, throughout the wrapping operation the connecting wire portion **33** remains securely anchored to the stationary sleeve, obviating any possibility of having the wire wrapped or entangled around a rotating spindle.

A further advantage in thus anchoring the wire is that the wrapping operation is, in effect, isolated from the connecting wire which is, therefore, not overtensioned, a feature of particular importance where the connecting wire path follows sharp bends around other terminals or dressers.

Although a specific embodiment of the invention has been shown and described, it will be understood that it is but illustrative and that various modifications may be made therein without departing from the spirit and scope of the invention. For example, it is apparent that the tool of this invention may be arranged for either counterclockwise rotation as shown herein or for clockwise rotation.

What is claimed is:

1. A combination tool for cutting wire, stripping the insulation from a portion of said wire, and wrapping said portion on a terminal comprising, a stationary, tubular sleeve member including a head portion at one end, a cut-away midportion and an enlarged portion at the other end, said head portion including a wire receiving slot in the side thereof, at least one wire anchoring notch in the forward edge thereof, and having an internal shoulder defining a rear face thereof, a stationary cutter member fixedly secured within the enlarged portion of said sleeve member, said cutter member having a central bore therethrough and a wire cutting notch in the forward face thereof, and a spindle member comprising a shaft rotatably mounted within said bore of said cutter member and having a head portion rotatably supported within said head portion of said sleeve member, said spindle having a cutter member affixed thereto and abutting the forward face of said stationary cutter member, said spindle head including a collar portion abutting said shoulder of said sleeve head and a wire skinning notch in said collar portion including a substantially semicircular knife edge, said spindle having a substantially axial terminal receiving opening in the head end and an extended portion at the opposite end thereof for rotating said spindle.

2. A tool for cutting an insulated wire, stripping insulation from a portion thereof, and wrapping the stripped portion on a terminal that comprises a sleeve and a spindle rotatable therein; said sleeve including a cylindrical rear portion, a head portion of lesser diameter, a tapered troughlike, intermediate portion, a stationary wire-cutting member secured within the rear portion of the sleeve and including a bearing for the spindle; said spindle including at one end a portion journaled in the stationary cutting member, a rotary cutting member adjacent said end and juxtapositioned with the stationary cutting member, thereby preventing rearward axial motion of said spindle, a head portion on the other end rotatable within the head portion of the sleeve and including a substantially axial terminal receiving opening, and an intermediate portion of reduced section spaced from the intermediate portion of the sleeve, said head portions having cooperating wire receiving slots and cooperating surfaces for preventing forward axial motion of said spindle, the spindle slot having an insulation cutting notch and the sleeve slot having a surface for forcing the insulation into said notch upon relative rotation of the sleeve and the spindle, and at least one wire anchoring slot in the end of the sleeve head.

3. A tool for cutting an insulated wire, stripping insulation from a portion thereof, and wrapping the stripped portion on a terminal that comprises a sleeve and a spindle rotatable therein and confined against axial movement relative thereto; said sleeve including a cylindrical rear portion, a head portion of lesser diameter, a tapered trough-like, intermediate portion, a stationary wire-cutting member comprising a semicylindrical body secured within the rear portion of the sleeve and having an axial bore therethrough constituting a bearing for the spindle; said spindle including at one end a portion journaled in the stationary cutting member, a rotary cutting member adjacent said end and juxtapositioned with the stationary cutting member, a head portion on the other end rotatable within the head portion of the sleeve and including a substantially axial terminal receiving opening, and an intermediate portion of reduced section spaced from the intermediate portion of the sleeve, said head portions having cooperating wire receiving slots, the spindle slot having an insulation cutting notch and the sleeve slot having a surface for forcing the insulation into said notch upon relative rotation of the sleeve and the spindle, and at least one wire anchoring slot in the end of the sleeve head.

References Cited in the file of this patent

UNITED STATES PATENTS

2,682,063	Miloche	June 29, 1954

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510,459	Belgium	Apr. 30, 1952