Aug. 11, 1942. S. C. WOODWARD 2,292,729

CUTTING DEVICE

Filed Jan. 2, 1941

Fig. 1.

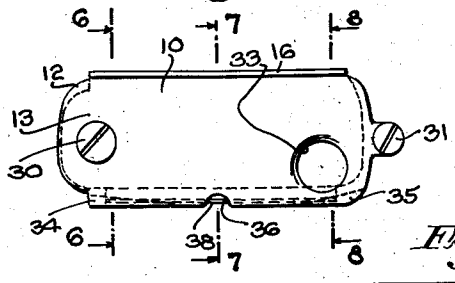


Fig. 4.

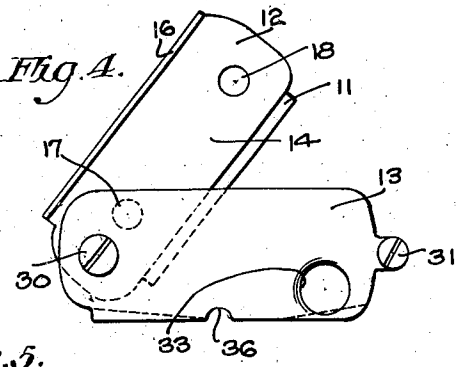


Fig. 5.

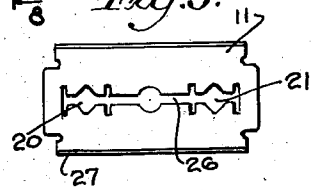


Fig. 2.

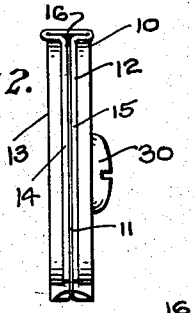


Fig. 3.

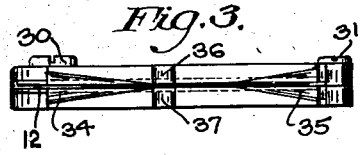


Fig. 6.

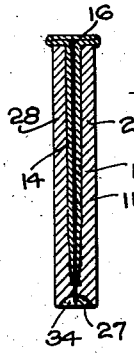


Fig. 7.

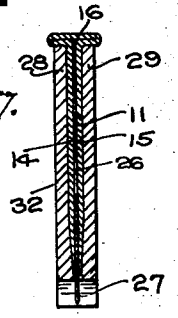


Fig. 8.

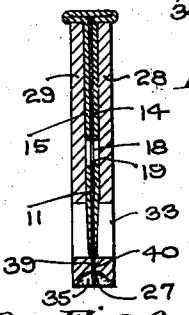


Fig. 10.

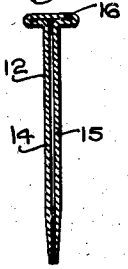


Fig. 9.

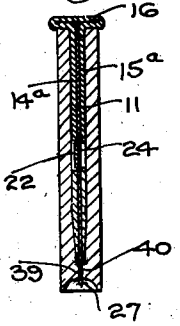


Fig. 11.

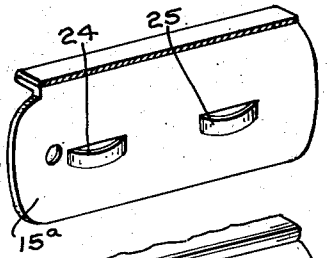
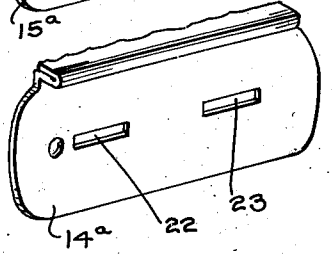


Fig. 12.



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2,292,729

CUTTING DEVICE

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Application January 2, 1941, Serial No. 372,857

5 Claims. (Cl. 81—9.5)

This invention relates generally to a cutting device and more particularly to an improved construction of tool for slitting or cutting the insulation of electric conductor wires to facilitate the removal of as much of the insulation as may be desired at any point or points along the length of the wire, thereby exposing the naked wire for splicing to another wire or wires or for connection to an electrical terminal.

Among the general objects of the present invention is to provide an insulation stripping device which is of such compact form that it may be conveniently carried on the person of the user thereof, which is designed to use as the cutting element a conventional double-edged type of safety razor blade, and which is provided with a collapsible holder for the blade of such character that upon opening the same the blade may be employed as an ordinary cutting tool while, when closed, the holder serves not only as a safety housing for the blade but also to permit use of the device as a tool for stripping insulation from an electric conductor wire.

More specifically, it is an object of the present invention to provide a holder for a conventional safety razor blade of the wafer type and a sheath for safely enclosing the blade in its holder, the sheath being so designed and having means therein to effect longitudinal and circumferential scoring or slitting of the insulation on an electric conductor wire while the blade is enclosed in said sheath.

A further object is to provide means in a tool of the character above described for limiting the depth of the cut into the insulation, thereby insuring against cutting into and so weakening the conductor wire itself.

Other objects and advantages of the invention, such as economies resulting from the simple and inexpensive but withal serviceable construction of the present tool and its capability for use as a cigar clipper and as a cutting device having general utility, will appear more fully hereinafter, it being understood that the present invention consists in the combination, construction, location and relative arrangement of parts, as shown in the accompanying drawing, as described in the following detailed specification and as finally pointed out in the appended claims.

In the accompanying drawing, which shows for purposes of illustration the preferred embodiments of the present invention—

Figure 1 is a side view showing the cutting device of the present invention in closed position;

Figure 2 is an end view thereof;

Figure 3 is a bottom view thereof;

Figure 4 is a view showing the blade of the tool in partially opened position;

Figure 5 is a view of a typical safety razor blade such as may be employed in the device of the present invention;

Figures 6, 7 and 8 are sectional views taken respectively on the lines 6—6, 7—7 and 8—8 of Figure 1;

Figure 9 is a sectional view corresponding to Figure 8 showing a modified form of construction of the blade holder per se;

Figure 10 is a sectional view of the blade holder per se taken on the line 6—6 of Figure 1; and

Figures 11 and 12 are perspective views respectively showing the opposed plates of the blade holder of the modified form shown in Figure 9.

Referring now to the drawing, it will be observed that the device of the present invention designated generally by the reference numeral 10, consists generally of three principal parts, namely, a blade 11, a holder 12 therefor and a sheath 13 for receiving the holder and its blade when the device is folded into its compact form as shown in Figures 1 and 2. The blade 11 is of the conventional double-edge wafer type of safety razor blade, although it will be understood that other types of flat blades having single or double cutting edges may be employed. The holder 12 for the blade 11 is formed of sheet metal folded upon itself, as best shown in Figure 10, to provide a pair of spring-pressed clamping plates 14 and 15 between which is adapted to be inserted the blade 11. The plates 14 and 15 of the holder are coextensive in size and shape, being somewhat longer than the length of blade secured therebetween but of a depth sufficiently less than the width of the blade so that when the blade is positioned between the plates 14 and 15 of the holder one longitudinal cutting edge of the blade projects freely beyond the corresponding edge of the holder, as is shown most clearly in Figures 4, 6, 7 and 8.

As appears most clearly in Figures 6 to 12, inclusive, the upper edges of the opposed clamping plates 14 and 15 of the blade holder are secured together by an intermediate section 16 of the material of which the said plates 14 and 15 are formed, this intermediate section being folded upon itself so as to provide a relatively wide head or bead extending longitudinally along the upper edge of the holder. The holder is thus formed of generally T-shaped vertical cross-section in which the head 16 provides a closed edge

to protect the normally inoperative cutting edge of a double-edged blade 11 inserted between the clamping plates 14 and 15. While the blade 11 may be secured in its holder 12 simply by the frictional engagement between the blade and the opposed spring-pressed clamping plates 14 and 15 of the holder, it is preferable to provide means for more positively locking the blade in the holder so as to prevent accidental or unintentional displacement therefrom. To this end, the holder 12 is provided, in one form thereof, with longitudinally spaced perforations 17 and 18 (see Figure 4) in each of the plates 14 and 15 thereof, the perforations 17 and 18 in the plate 15 being in registry with corresponding perforations in the plate 14 and in addition the perforations in one of said plates being deformed so as to provide an annular lip 19 in each of said perforations which projects toward and enters to slight degree the corresponding perforations in the opposite plate.

The perforations 17 and 18 are so located as to register with the longitudinally spaced openings 20—21 which are normally present in the conventional type of safety razor blade of the wafer type. It will thus be seen that in order to securely lock such a blade 11 in position within its holder 12 it is merely necessary to spread apart the plates 14 and 15 of the latter sufficiently to permit the blade to be inserted therein with the openings 20 and 21 of the blade in registry with the apertures 17 and 18 of the blade holder. The inwardly projecting annular portions 19 of the apertures in one of the plates thus project through the openings 20 and 21 of the blade and coact with the registering openings in the opposite plate of the holder to lock the blade securely in position.

In another form of the blade holder, as shown more particularly in Figures 9, 11 and 12, the plate 14*a* of the blade holder is provided with a pair of longitudinally spaced slots 22 and 23, while the opposite plate 15*a* thereof is provided with a pair of correspondingly spaced inwardly pressed elements 24 and 25, the latter elements being in registry with the slots 22 and 23 in the plate 14*a*. The spacing of the registering slots and projecting elements just described corresponds to the spacing of the openings 20 and 21 of the blade 11 or to the longitudinally extending slot 26 normally provided in the present day conventional type of double-edged safety razor blade. In the form of holder shown in Figures 9, 11 and 12, the blade to be secured therein is shifted longitudinally into the open end of the holder 12 until the openings 22—23 and their coacting projecting elements 24—25 register with the openings normally present in the blade, the latter being thus held securely in position within the holder. In both cases, the lower cutting edge 27 of the blade extends freely beyond the corresponding edge of the holder therefor.

As appears most clearly in Figures 1 to 4, the holder 12 is normally encased within the sheath 13, the latter being formed of a pair of substantially identical plates 28 and 29 secured together at opposite ends thereof by screws or other such securing elements 30 and 31. The plates 28 and 29 of the sheath 13 are spaced apart in any suitable manner by any suitable means to an extent just sufficient to snugly receive therebetween the holder 12 for the cutting blade. As appears most clearly in Figures 1 and 4, the holder 12 is pivoted to the sheath 13 upon the shank of the screw 30 which is employed at one end of the sheath for securing the plates 28 and 29 thereof together. The opposite or free end of the holder extends to a point just short of the securing screw 31 of the sheath, in consequence of which the holder 12 may be readily shifted about its pivot 30 from a closed position as shown in Figure 1 to a position in which the holder and its sheath are in longitudinal continuation of each other, the sheath 13 serving in this latter instance as a handle or hand grip for the tool when it is fully opened.

If desired, the opposite plates 28 and 29 of the sheath may be provided with registering openings 32 and 33 into one or the other of which may be projected the tip end of a cigar to be clipped off when the blade holder is shifted from its position shown in Figure 4 to its closed position shown in Figure 1.

In order to adapt the cutting device as above described more particularly for use as a tool for stripping the insulation from electric conductor wires, which is the most important object of the present invention, longitudinally extending portions of the opposite plates 28 and 29 of the sheath are complementally formed at opposite extremities thereof to provide a pair of grooves 34 and 35. These grooves are each of gradually increasing depth so as to expose to gradually increasing extent the opposite corners of the cutting edge of the blade when the latter is in its closed position as shown in Figures 1, 2 and 3. In addition, the side plates 28 and 29 of the sheath member 13 are respectively provided with registering notches 36 and 37 to thereby expose a limited section 38 of the cutting edge of the blade as shown more particularly in Figure 1, these registering notches 36 and 37 being located intermediate the grooves 34 and 35 aforesaid.

It will be noted as appears most clearly in Figures 6, 8 and 9 that the lower edges of the side plates 28 and 29 of the sheath member 13 extend inwardly, as at 39 and 40, to provide a space therebetween just sufficient to accommodate the freely projecting cutting edge 27 of the blade. The inwardly projecting portions 39 and 40 extending along the longitudinal edges of the plate members 28 and 29 of the sheath 13 thus cooperate with the holder 12 to provide adequate support for and impart rigidity to the entire blade. It will also be noted that when the device is in its closed position, as shown in Figures 1, 2 and 3, the opposite corners of the cutting edge of the blade are exposed only to the limited extent permitted by the grooves 34 and 35 formed in the bottom edge of the sheath. Similarly, the intermediate portion 38 of the blade is exposed only to the extent permitted by the registering notches 36 and 37 formed in the bottom of the sheath.

Consequently, when either lower corner of the device is applied to a conductor having an insulating cover, such as rubber, fabric or the like, and is drawn lengthwise of the conductor at the same time that pressure is applied thereto, the conductor will be slitted to an extent or to a depth governed by the depth of the groove 34 or 35. Having so slitted the insulation on the wire, the insulation may be laid back and then trimmed off in any suitable manner to expose the naked wire. If it is desired to slit the insulation circumferentially, the wire is laid transversely against the exposed section 38 of the cutting edge of the blade and then rotated. Obviously, by so forming a pair of circumferential slits in the insulation at spaced points and then slitting the

insulation lengthwise from slit to slit, an intermediate portion of the insulation may be readily stripped from the wire. Also, it will be apparent that because the depth of the exposed portions of the cutting edge of the blade is definitely fixed, there is effectually precluded any possibility of the blade cutting into and so weakening the conductor wire itself.

Preferably, the grooves **34** and **35** provided at either end of the tool are each graduated in depth to varying degrees so as to expose the opposite corners of the cutting edge of the blade to different extents, thus providing in the same tool means for effecting two degrees of depth of cut into the conductor wire insulation when the tool is drawn lengthwise thereof.

The longitudinally extending head **16** of the blade holder, of course, extends lengthwise of and is adapted to engage the upper longitudinal edges of the sheath **13** when the tool is closed as shown in Figure 1 to thereby not only provide an effective closure at the top of the tool but also prevent the blade holder from swinging beyond its properly closed position as shown in Figure 1. Also, the head **16** serves as a finger grip to facilitate easy opening of the device into position such as is shown in Figure 4.

It will be understood, of course, that the invention is susceptible of various changes and modifications from time to time without departing from the real spirit or general principles thereof and it is accordingly intended to claim the same broadly, as well as specifically, as indicated by the appended claims.

What is claimed as new and useful is:

1. In a cutting tool of the character described, a holder for removably receiving a flexible blade with one edge of the latter exposed throughout its entire length, and a sheath for said holder pivoted thereto, said sheath being open along both of its longitudinal edges and being of a size and shape to embrace the cutting edge of said blade when the holder is swung into said sheath, the opening in one longitudinal edge of said sheath being of a width sufficient to freely permit the blade holder to be projected therethrough and the opening in the opposite edge of the sheath being restricted in width to snugly receive and brace the free edge of the blade when the holder is encased in the sheath, said last-mentioned longitudinal edge of said sheath being provided with a groove in its longitudinal edge for exposing a portion of the cutting edge of the blade at one end thereof.

2. In a cutting tool of the character described, a holder for removably receiving a flexible blade with one longitudinal edge of the latter exposed throughout its entire length, a sheath for said holder, said sheath being open along both of its longitudinal edges and being of a size and shape to normally embrace the cutting edge of the blade when the holder is encased in said sheath, the opening in one longitudinal edge of said sheath being of a width sufficient to freely permit the blade holder to be projected therethrough and the opening in the opposite edge of the sheath being restricted in width to snugly receive and brace the free edge of the blade when the holder is encased in the sheath, and means in said sheath for exposing a limited portion of the cutting edge of the blade while said holder is encased in said sheath.

3. In a cutting device of the character defined in claim 2 wherein said last-mentioned means is in the form of a groove provided in the longitudinal edge of the sheath and wherein said groove is of a graduated depth to limit the penetration of the exposed portion of the blade cutting edge into the material to be cut.

4. In a cutting device of the character described, a sheath for a blade holder including a pair of spaced side panels the lower edges of which have complementally formed thickened edges to provide a relatively narrow slot therebetween, said lower edges being complementally beveled to provide a channel or groove of limited length and depth adapted to receive an insulated conductor wire, a holder adapted to receive a removable blade with one longitudinal edge of the blade exposed, said holder being adapted for accommodation in the space between the side panels of said sheath with the exposed edge of the blade extending into said narrow slot, and a blade removably received in said holder, a portion of said blade being freely exposed by the channel or groove of the sheath when the holder is completely encased by said sheath whereby to render said exposed portion of the blade available to longitudinally slit the insulation on said wire.

5. In a cutting device of the character defined in claim 4 wherein said sheath is provided with a channel or groove as aforesaid at each opposite end of the longitudinal lower edge of the sheath to thereby expose opposite corner portions of the blade for slitting action.

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