Feb. 3, 1959 C. A. GRANZOW 2,871,739

CABLE STRIPPING TOOL

Filed June 7, 1955

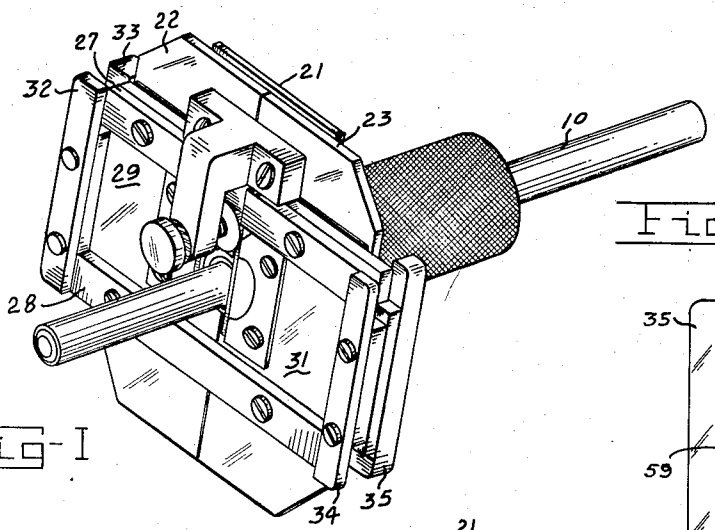


Fig-1

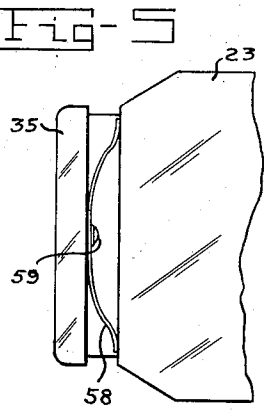


Fig-5

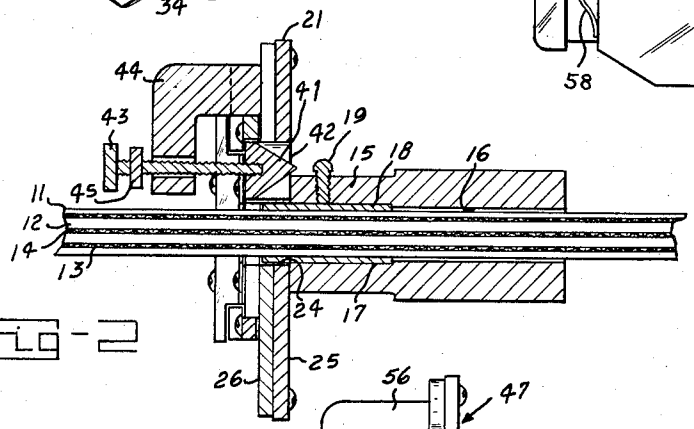


Fig-2

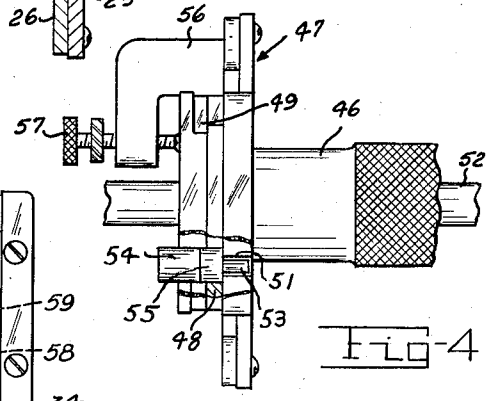


Fig-4

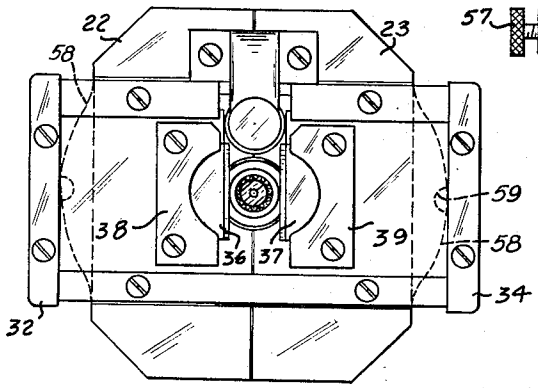


Fig-3

INVENTOR.
CARL A. GRANZOW
BY Tom Walker

United States Patent Office

2,871,739

Patented Feb. 3, 1959

2,871,739

CABLE STRIPPING TOOL

Carl A. Granzow, Dayton, Ohio

Application June 7, 1955, Serial No. 513,681

12 Claims. (Cl. 81—9.5)

This invention relates to cable stripping tools, and more particularly to a device useful for the cutting of coaxial cable and the like to selective depths for the stripping of a greater or lesser number of the layers of conducting and insulating material thereupon.

The object of the invention is to simplify the construction as well as the means and mode of operation of cable stripping tools, whereby such tools may not only be economically manufactured, but will be more efficient and satisfactory in use, adaptable to a wide variety of applications, and be unlikely to get out of repair.

A further object of the invention is to present a relatively small and light cable cutter as described which may readily be applied by hand to the work and easily manipulated to perform its cutting operation.

Another object of the invention is to provide replaceable means in the tool for accurately holding and centering the cable for performance of the cutting action, such means being selectively substituted in the tool in accordance with the external diameter of the cable to be cut.

A further object of the invention is to provide means for varying the depth of cut made by the tool in the cable acted thereon.

Still another object of the invention is to provide a plurality of means for controlling the depth of cut, one such means defining selected predetermined limits corresponding to standard laminar thicknesses in a coaxial cable and the other providing an adjustable means for varying the depth of cut between the relatively fixed limit points defined by the first said means.

A further object of the invention is to provide a cable stripping tool possessing the advantageous structural features, the inherent meritorious characteristics and the mode of operation herein mentioned.

With the above primary and other incidental objects in view as will more fully appear in the specification, the invention intended to be protected by Letters Patent consists of the features of construction, the parts and combinations thereof, and the mode of operation as hereinafter described or illustrated in the accompanying drawings, or their equivalents.

Referring to the accompanying drawing, wherein is shown one but obviously not necessarily the only form of embodiment of the invention,

Fig. 1 is a view in perspective of a cable stripping tool in accordance with one illustrated form of the invention;

Fig. 2 is a view in longitudinal section of the tool of Fig. 1;

Fig. 3 is a view in front elevation of the tool of Figs. 1 and 2;

Fig. 4 is a view in side elevation, partly broken away, of a tool in accordance with a modified illustrated form of the invention; and

Fig. 5 is a fragmentary view looking from the back of Fig. 1 or from the right of Fig. 2.

Like parts are indicated by similar characters of reference throughout the several views.

Referring to Figs. 1 through 3, the tool here illustrated is shown applied to a fragment of a coaxial cable 10 in which layers 11 and 12 of an insulating material alternate with a layer 13 and a core 14 of a conductive material. As will be understood from the foregoing introduction, it is a function of the instant tool to adapt itself readily to cable of different overall diameters and to cut selectively through the layers of material which make up the cable. Thus, in the illustrated instance, the tool may be adjusted for the cutting and stripping of the outer layer of insulation 11 only, or the depth of cut may be increased to include the layer 13 of conductive material and the cut may be still further increased in depth to include the layer of insulating material 12, leaving only the conductive layer or core 14.

The tool comprises a hand grip portion in the form of a sleeve 15 externally knurled over a part of its length. The sleeve 15 is formed with a longitudinal bore 16 and in one end of such bore is a counterbore 17. Received in the counterbore 17 is a bushing insert member 18 having an external diameter such as to achieve a sliding fit within the bore 17 and having an internal diameter such as to achieve a similar relationship with the exterior of the cable 10. In the use of the tool, there will be provided a plurality of bushing inserts 18, all having the same external diameter so as to be received in the counterbore 17 but varying in their internal diameter, each of the different internal diameters corresponding to cables of commonly encountered dimensions. In adapting the tool for work upon a cable of certain external diameter, a bushing insert 18 of corresponding internal diameter is selected and installed in the counterbore 17 and in order that it may be held therein there is provided a radially adjustable set screw 19 in the sleeve 15.

At its one end the bushing insert 18 seats in the bottom of the counterbore 17. The other end of the insert projects through and beyond the open outer end of the counterbore in a manner to provide a mount for a plate 21 which together with an adjacent pair of plates 22 and 23 forms a unitary cutter mounting plate assembly, the several plates 21, 22 and 23 being bolted or otherwise secured together and here shown separate in the interest of convenience. The cutter mounting plate assembly is in a plane at right angles to the longitudinal axis of bore 16 in the sleeve 15 and is formed with a central opening 24 receiving the projecting end of the bushing insert 18. As mounted on the insert member 18, the unitary mounting plate assembly presents what may be considered a rear planar surface 25 abutting the adjacent end of the sleeve 15, and what may be considered a front planar surface 26 in a plane slightly in advance of the outer end of bushing insert 18.

Mounted on the planar surface 26 of the cutter mounting plate assembly are upper and lower transversely extending slideways 27 and 28 in which are arranged oppositely disposed slide members 29 and 31. On what may be considered to be the outer ends of the slide members or slides 29 and 31 are bars or laminations 32—33 and 34—35, respectively, serving to broaden such outer edges of the slides for better application of finger pressure by which the slides may be urged inward or in an approaching direction relatively to one another. On the opposite or inner edges of the slides 29 and 31, respective cutting blades 36 and 37 are secured by respective auxiliary plates 38 and 39.

The slides 29 and 31, and the blades 36 and 37 thereon, are thus reciprocable in a plane parallel to and adjacent to the planar surface 26, and in a transverse sense relative to the outer end of the bushing insert member 18 and to the cable 10. The latter extends from the insert member through and beyond the plane of reciproca-

tion of the slides 29 and 31 between the cutter blades 36 and 37. Inward pressure applied to the slides 29 and 31 accordingly will result in the cable being transversely cut by the blades 36 and 37 and it will further be understood that relative rotary motion of the mounting plate assembly and of the cable 10 will result in the blades 36 and 37 making a continuous circular cut in the cable.

The depth of the described cut is controlled, in the form of the invention disclosed in Figs. 1 through 3 by a cone shaped part 41 accommodated in an opening 42 in the cutter mounting plate assembly located in vertically spaced aligned relationship to the opening 24. The cone shaped part 41 is at one end of a screw stud 43 having a screw threaded mounting in a bracket 44 fastened to the cutter mounting plate assembly in overlying relation to the upper slideway 27. The construction and arrangement of parts is such as to locate the cone shaped part 41 between the inner ends of the slides 29 and 31 in such manner that the inner ends of the slides may engage the part 41 and so be limited in their approaching motion relatively to one another. Accordingly, it will be understood that by adjustment of the screw stud 43 in the bracket 44 the cone shaped part 41 may be adjusted to present different parts of its tapering surface for contact by the slides 29 and 31 and that in each such different position of the cone shaped part a different limit of approaching motion is defined for the slides 29 and 31. A lock screw 45 is on the screw stud 43 and may be turned up against the bracket 44 to hold the cone shaped part 41 in a selected position of adjustment.

The part 41, it will be understood, is preliminarily set to define a depth of cut for the blades 36 and 37 sufficient to strip a selected number of layers of material from the cable. To cut a different number of layers from the cable the cone shaped part 41 is correspondingly adjusted to increase or to decrease the depth of the cut permitted to be made by the blades 36 and 37.

In the modified form of the invention shown in Fig. 4, there is added to the device of Figs. 1 to 3 another control means for limiting approaching motion of the cutter blades 36 and 37, this means being adapted for variation between predetermined fixed positions as contrasted with the relatively infinite means of variation represented by the cone shaped part 41 of the above embodiment.

Thus, in the embodiment of Fig. 4, a sleeve 46 removably and rotatably mounts a cutter mounting plate assembly 47 on which are opposed slides 48 and 49. The plate assembly 47 has an opening 51 in underlying relation to the opening for cable 52 and receivable therein is the shank 53 of a stud 54, the stud 54 extending longitudinally outward beyond the plane of the slides 48 and 49 so that it may readily be removed from and replaced in its place of installation in the plate assembly 47.

A collar 55 is slidably received on the shank 53 and in the installed position of the stud 54 occupies a position of confinement between the plate assembly 47 and the enlarged head portion of the stud 54 between and substantially in line with the slides 48 and 49. The collar 55 accordingly provides a limit stop for the slides and it will be understood that in the use of the tool, a number of different collars 55 are provided which are selected for use and substituted in the tool in accordance with the requirements of the work. Thus, a different collar 55 is selected for each different depth of cut desired to be made in the cable.

The control means as represented by the collars 55 on the replaceable stud 54 may be used in place of the control represented by the cone shaped part 41 of the above considered embodiment or it may, as in the illustrated instance, be used in conjunction with such other control means in the same tool. So used, the collars 55 represent a means for insuring accurate cutting and removal of selected layers of material in standard cables, while the cone shaped adjustment means provides for

selective variation in the depth of cut as may be required by non-standard cable constructions.

In the modified form of the invention, a bracket 56 is attached to the plate assembly 47 and supports a screw stud 57 on the inner end of which is a cone shaped part like the part 41 of the first considered embodiment of the invention and operating in a like manner to control the approaching motion of the cutters 48 and 49. In the use of the tool, the cutters are pressed together by hand until they are positively limited in such motion by engagement with the cone shaped part or with a collar 55, the cutter blades having penetrated the cable to a predetermined degree as such cutters reach a position of limit against the stop device. Then, rotating the plate assembly as before described, results in carrying the cutters about the periphery of the cable and consequent cutting of a greater or lesser portion thereof as may be determined by the selection of or adjustment of the stop devices.

In both forms of the structure (Figs. 1 and 4) the slides 29 and 31 are spring biased outwardly or toward their open position. Such construction facilitates the insertion and removal of the cable 10 since the slides and their associated cutting blades are thereby moved out of the path of the cable. As shown in Fig. 5 the slides are biased to open position by means of a spring 58 secured to the bar on the outer end of the slide by means of a rivet 59. The opposite ends of the spring 58 have free sliding engagement along the end face of the cutter mounting plate assembly. Thus, when grasped by the operator the plates are moved inwardly to engage and cut the insulation from the cable 10, such inward movement being against the resistance of the springs 58. After completion of the cutting operation and release of the slides the inherent resiliency of the springs 58 retract the slides automatically to open position thereby freeing the cable 10 for withdrawal from the tool.

It is noted that the separate control means described serve distinct purposes. The cone control means provides for selective variation of the depth of cut through a full range, while the specific collar control means enables specific standard cutting depths to be immediately established by insertion of the appropriate collar intermediate the blades of the cutter assembly. By having both depth control means, the desired depth of cut may be instantaneously established when the apparatus is applied to a standard cable while the cone control is available for non-standard applications or for vernier adjustment of a cutting depth.

From the above description it will be apparent that there is thus provided a device of the character described possessing the particular features of advantage before enumerated as desirable, but which obviously is susceptible of modification in its form, proportions, detail construction and arrangement of parts without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statute the invention has been described in language more or less specific as to structural features, it is to be understood that the invention is not limited to the specific features shown, but that the means and construction herein disclosed comprise but one of several modes of putting the invention into effect, and the invention is therefore claimed in any of its forms or modifications within the legitimate and valid scope of the appended claims.

Having thus described my invention, I claim:

1. A cable stripping tool, including a hand grip portion having a longitudinal bore therethrough, a cutter including a mounting plate in a plane at right angles to said longitudinal bore rotatably mounted relative said hand grip, said plate having an opening aligned with the bore, cutter members slidably mounted on said plate on opposite sides of said opening, said members being movable in a common plane parallel to said plate in relative

approaching and separating relation to one another, and means mounting variably sized means between said cutter members for limiting relative approaching motion of said cutter members.

2. A cable stripping tool, including a hand grip portion having a longitudinal bore therethrough, a replaceable bushing insert slidably received in one end of said hand grip portion, said insert having an internal diameter of a size accurately to hold and position a cable of predetermined outside diameter, a cutter plate assembly rotatably mounted relative to said hand grip portion and comprising a plate connected to said hand grip portion having cutter members relatively reciprocable thereon and movable in a plane at right angles to the axis of said bushing insert near to one end of said insert and spring means respectively between said cutter members and said plate normally biasing said cutter members away from each other.

3. A cable stripping tool, including a hand grip portion having a through longitudinal bore therethrough, a replaceable bushing insert received in and projecting from one end of said bore, said insert having an internal diameter of a size accurately to hold and position a cable of predetermined outside diameter, a cutter mounting plate rotatably mounted on the projecting part of said bushing insert, and cutter means mounted on said plate for relative motion toward and from the axis of said bushing insert in a plane at right angles thereto.

4. A cable stripping tool according to claim 3, characterized by means for variably limiting the motion of said cutter means toward the axis of said bushing insert.

5. A cable stripping tool, including a hand grip portion having a through longitudinal bore therethrough, a replaceable bushing insert received in and having an end projecting from one end of said bore for centering a cable of predetermined outside diameter, a cutter mounting plate rotatably mounted on the projecting part of said insert, said plate occupying a plane at right angles to the longitudinal axis of said insert, a pair of opposed cutter members slidably mounted on said plate on opposite sides of the axis of said insert and having opposed cutting edges in a plane in advance of the said end of said insert, said cutter members being movable to effect relative approaching and withdrawing motions thereof, means for variably limiting relative approaching motion of said members.

6. A cable stripping tool according to claim 5, characterized in that said means for limiting approaching motion of said cutter members comprises a cone shaped stop interposed between said members, said stop being adjustable to allow said members to approach one another more and less closely.

7. A cable stripping tool, according to claim 5, characterized in that said means for limiting approaching motion of said cutter members comprises a stud removably installed in said plate between said members and a stop element replaceable on said stud and engageable by said members, said stop element having an external configuration predetermined to permit only a certain depth of cut in the cable by said cutting edges.

8. A cable stripping tool according to claim 5, characterized in that said last named means comprises a stud removably installed in said plate and a stop element replaceable on said stud for engagement by said members to limit the depth of cut by said cutting edges in correspondence with the external dimensions of said stop element, and further comprises a cone shaped stop element adjustably mounted on said plate for motion in a plane parallel to the longitudinal axis of said insert between said cutter members.

9. A cable stripping tool, including a hand grip portion having a through longitudinal bore therethrough, a replaceable bushing insert received in and having an end projecting from one end of said bore for centering a cable of predetermined outside diameter, a cutter mounting plate rotatably mounted on the projecting part of said insert, said plate occupying a plane at right angles to the longitudinal axis of said insert, a pair of cutter members in relatively opposing relation to one another on opposite sides of said longitudinal axis of said insert, said members being arranged for sliding motion in a plane parallel to said plate toward and away from one another, replaceable stop means on said plate limiting motion of said cutter members toward one another to selected distances, and other stop means on said plate adjustable to vary within intermediate limits permitted relative approaching motion of said members.

10. A cable stripping tool as set forth in claim 1, characterized by spring means connecting between said mounting plate and said cutter members and normally maintaining said cutter members in separated relation.

11. A cable stripping tool, including a hand grip portion having a longitudinal bore, a cutter including a mounting plate rotatably connected to said hand grip in a plane at right angles to said longitudinal bore, said plate having an opening aligned with the bore, cutter members slidably mounted on said plate on opposite sides of said opening, said members being movable in a common plane parallel to said plate in relative approaching and separating relation to one another, means for limiting relative approaching motion of said cutter members, a bushing in said bore and projecting therefrom, the projecting end of said bushing being receivable in the opening in said mounting plate to support said cutter portion, said plate being removable from said hand grip portion and said bushing being replaceable in said bore with bushings of other internal diameters.

12. A cable stripping tool, including a hand grip portion having a longitudinal bore therethrough, a cutter including a mounting plate in a plane at right angles to said longitudinal bore rotatably mounted relative said hand grip, said plate having an opening aligned with the bore, cutter members slidably mounted on said plate at opposite sides of said opening, spring means respectively engaging to said cutter members and said plate to normally bias said cutter members away from said opening and said members being movable in a common plane parallel to said plate in relative approaching relation to one another against the influence of said spring means whereby on release of said cutter members they will automatically be biased away from said opening.

References Cited in the file of this patent

UNITED STATES PATENTS

1,661,180	Johnson	Mar. 6, 1928
2,120,398	Edwards	June 14, 1938
2,317,944	Schaefer	Apr. 27, 1943
2,539,776	Gordon	Jan. 30, 1951