

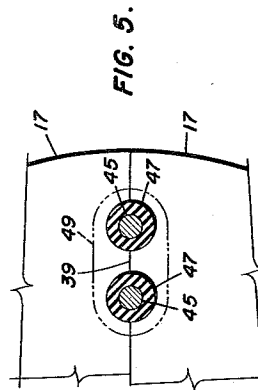
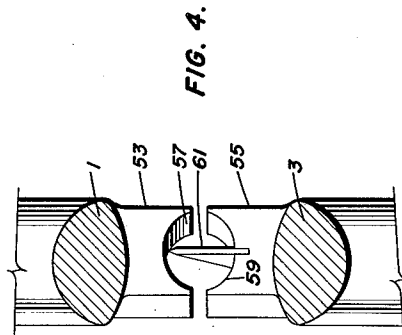
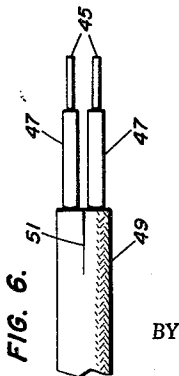
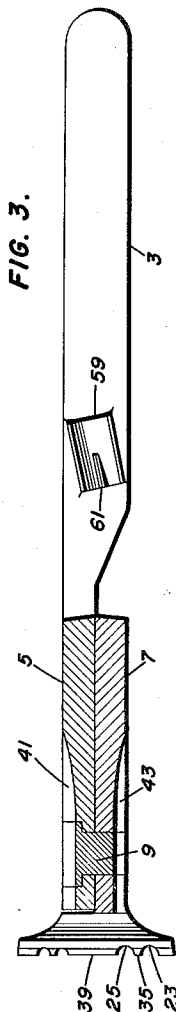
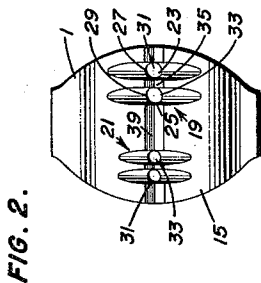
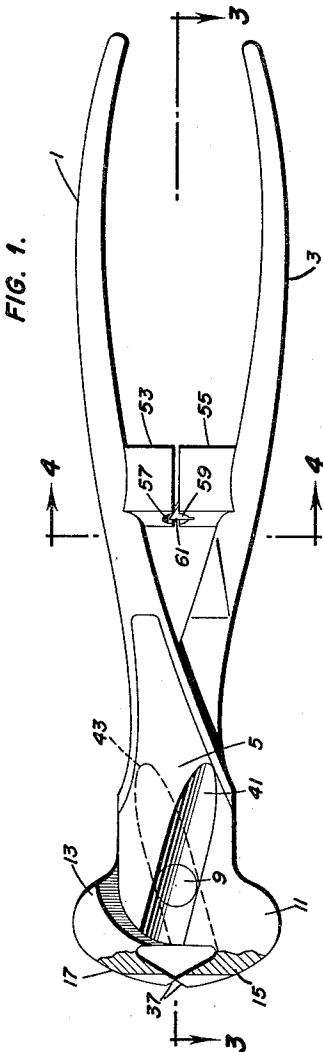
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SHEATH CUTTING TOOL FOR WORKING SHEATH COVERED CABLES

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SHEATH CUTTING TOOL FOR WORKING SHEATH COVERED CABLES

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This invention relates broadly to the art of tools for performing certain operations on sheathed electric cables, and in its more specific aspects it relates to tools provided with cutting edges adapted to cut the sheath which covers the insulated wires in plural electric conductors; and the nature and objects of the invention will be readily recognized and understood by those skilled in the art to which it relates in the light of the following explanation and detailed description of the accompanying drawings illustrating what I at present believe to be the preferred embodiment or mechanical expressions of my invention from among various other forms, arrangements, combinations and constructions, of which the invention is capable within the spirit and scope thereof.

It is conventional practice to provide electric cables comprising plural insulated conductors or wires with an outer covering or sheath which encloses or houses the plural insulated conductors. In the use of such cables it is usually necessary to remove lengths of the sheath from its position about the insulated wires while leaving the insulation about the conductors. It is highly desirable and necessary to preserve the insulation in its original condition during the operation of removing the sheath, the insulation covering the conductors must not be cut or otherwise damaged by the cutting means for the sheath or by the removal thereof.

I have devised a unique tool for cutting the sheaths of electric cables for their subsequent removal therefrom to expose the insulated electric conductors which are normally enclosed within the sheath. The tool of this invention is of plier-like form and is so designed that the insulation covering the conductors will not be cut or damaged in any manner whatsoever when the sheath is cut by the tool.

In evolving this tool I have recognized that speed in making the complete cut in the sheath and manipulative facility are important to the user of the device. My tool has been designed to and will instantly and with only a single stroke form a clean circumferential cut through the sheath so that it may be removed from the enclosed insulated conductors merely by pulling gently on the end of the severed sheath.

Electric cable of the plural conductor type is provided in different sizes, the most commonly used being designated in the trade as A.W.G. No. 14-2, and A.W.G. No. 12-2. My tool has been designed for one stroke cutting on such commonly used cable and could by simple dimensional changes be made to cut sheaths on cable of other sizes. As pointed out, the tool is designed for cutting sheaths on cables of any two selected sizes and I have provided means on the tool for slitting the sheaths on cables of various sizes.

In furthering the speed and facility of the operation of cutting sheaths on cables of two different sizes I have provided ingenious means on the tool for properly locating the cable with respect to the sheath cutting means. This arrangement ensures that the cable will be located properly so that a clean, sure and quick cut will be obtained and the insulation on the enclosed conductors will not be cut or damaged.

The tool of this invention may be economically produced, is sturdy, and will function indefinitely under actual use conditions.

With the foregoing general objects, features and re-

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sults in view, as well as certain others which will be apparent from the following explanation, the invention consists in certain novel features in design, construction, mounting and combination of elements, as will be more fully and particularly referred to and specified hereinafter.

This application is a continuation-in-part of my application Serial No. 740,383, filed June 6, 1958, now abandoned.

Referring to the accompanying drawings:

FIG. 1 is a top plan view of the tool with parts thereof in section.

FIG. 2 is a view in end elevation of the tool.

FIG. 3 is a view taken on line 3-3 of FIG. 1.

FIG. 4 is a view taken on line 4-4 of FIG. 1.

FIG. 5 is a fragmentary view illustrating the cable in position being cut and showing the cut or severed sheath.

FIG. 6 is a view showing a plural conductor electric cable with a section of sheath removed therefrom and also disclosing a split in the sheath.

In the accompanying drawings I have illustrated my sheath cutting tool as comprising a pair of end cutting pliers having a pair of elongated handles 1 and 3 provided with forward transversely extending enlarged portions 5 and 7 which intersect and are pivoted together by pivot stud or pin 9. At the forward end of each enlarged portion 5 and 7 I form a lateral extension 11 and 13, respectively, and from the forward end of each such lateral extension I provide a cutting jaw 15 and 17, the cutting jaws extending inwardly toward each other, and the opposing edges of the jaws being in abutment when the handles 1 and 3 are pivoted together.

The sheath cutting arrangement of my invention is formed on the opposing edges of the jaws, and consists of two spaced cutting organizations, which I have designated in their entirety by the numerals 19 and 21, the cutting organization 19 being adapted for cutting the sheath on one size of cable and the organization 21 being adapted for cutting the sheath on another size cable. It is to be understood that it is within my contemplation to add one or more cutting organizations to the device by increasing the width of the cutting jaws so that more than two sizes of cable may be worked on.

The jaw 15 is milled or otherwise formed to provide a pair of spaced semi-circular cutting edges 23 and 25 which extend inwardly from the edge of the jaw, and the jaw 17 is formed in like manner to provide a pair of complementary spaced semi-circular cutting edges 27 and 29. It will be apparent from consideration of the drawings that the pairs of complementary cutting edges are aligned so that when the jaws 15 and 17 are brought together, a pair of spaced circular openings 31 and 33 is provided with a pair of what I shall term sharpened punches or cutting elements 35 therebetween. It is to be understood that each semi-circular cutting edge is sharpened through out its arcuate length so that upon bringing the jaws together into the position illustrated in FIG. 2 the continuous edge of each circle will constitute a cutting edge and it is also to be understood that I preferably bevel each element 35 as at 37 to provide a sharpened punch effect.

The organization 21 is of the same structure and arrangement as that just described with respect to cutting organization 19, with the exception that the semi-circular cutting edges are formed on a shorter radius to provide circular openings 31 and 33 of reduced diameter relative to the diameters of the corresponding circular openings of cutting organization 19. Thus, cutting organization 21 is adapted to cut sheaths from cables of smaller size than those which are handled by cutting organization 19. The edges 39 of jaws 15 and 17 between the cutting organizations 19 and 21 are preferably sharpened.

On each enlarged portion 5 and 7 I provide elongated guide and cable locating grooves 41 and 43, respectively. The grooves 41 and 43 are open ended, that is, the forward and rearward ends of the grooves extend through the edges of the enlarged portions for ease of receiving and positioning the cable, as will become apparent as this description proceeds. The groove 41 is provided for locating a cable for its sheath cutting in organization 19 while groove 43 is provided for locating a cable for its sheath cutting in organization 21.

My sheath cutting tool has been especially designed for cutting the sheath from two conductor cables such as that disclosed in FIG. 6. Such cables comprise a pair of conductors 45, covered by insulation 47. The two insulated conductors are enclosed in a sheath 49 of any suitable and conventional material.

It is desired to remove a length of sheath 49 from a cable of a size accommodated by cutting organization 19, the cable is positioned in groove 41 with the cable extended between the jaws. The groove will aid in properly locating the cable and in maintaining it against lateral displacement on the enlarged portion. With the cable so positioned the handles 1 and 3 are grasped and pivoted together so that the jaws 15 and 17 will move toward each other, whereupon cutting edges 23, 25, 27 and 29 will cleanly cut the sheath 49 completely thereabout and cutting punches 35 will cut and punch between the insulation 47 of conductors 45. This cutting will be instantly accomplished on one stroke or movement of the handles and jaws. It will be understood that openings 31 and 33 are of slightly greater diameters than the diameters of insulation 47 so that the cutting edges will encircle the insulation but will not cut or damage it. The width of cutting punches 35 is slightly less than the distance between conductors, so that the cutting punches will not cut or damage insulation 47. The dimensional characteristics of the components of cutting organization 21 relative to a reduced size cable are the same as those of organization 19 relative to the particular cable it is designed to work on.

The groove 41 is positioned on the enlarged portion 5 with the forward end thereof directed away from the cutting organization 19 when jaws 15 and 17 are closed but with the end of the groove directed toward said organization when the jaws are separated sufficiently to receive the cable therebetween. The groove 43 is positioned in the same manner relative to cutting organization 21.

It will now be apparent that I have devised a sheath cutting tool which is simple and easy to manipulate, provides means for locating and guiding the cable and ensures a sharp, clean cut of the sheath upon a single stroke of the tool.

I have also provided means on the device for providing a longitudinal slit 51 through a sheath 49 between the insulated conductors 45. I have found this to be advantageous in removing sheaths from cables which are not sized properly to be worked on by cutting organizations 19 or 21.

This slitting means comprises a pair of opposing blocks 53 and 55 fixed to the inner surfaces of handles 1 and 3. I have termed block 53 the "guide block" and block 55 the "slitting block." The blocks are so dimensioned that they will be spaced apart when handles 1 and 3 are pivoted to their closest positions, as shown in FIG. 1. The block 53 is formed with a groove 57 extending from front to rear on its innermost surface while a similar groove 59 is formed on the inner surface of block 55.

The blocks 53 are somewhat angled relative to the longitudinal axes of handles 1 and 3 as clearly shown in FIG. 3 of the drawings. I provide a slitting tooth 61 in groove 59 of block 55. The grooves are adapted to receive a cable with tooth 61 projecting through the sheath and between the conductors, and by pulling the cable through the grooves the sheath will be slit as described.

I claim:

1. A tool for cutting sheath electric cables, comprising a pair of operating elements pivotally mounted together, said operating elements including rearward hand grasping sections and an inwardly directed jaw formed on the forward end of each operating element, the jaws being in engagement when the hand grasping sections are pivoted together, coactive means on said jaws for cutting the sheath of an electric cable when it is positioned between the jaws, at least one of said operating elements being provided with a groove in the exterior surface thereof between said jaws and said hand grasping sections and said groove being directed toward said coactive means when the sheath electric cable is positioned between said jaws, said groove adapted to receive a sheath electric cable therein for positioning the cable for cutting of the sheath by said coactive means.

2. A tool for cutting sheath electric cables in accordance with claim 1, wherein said groove is angled with respect to the axis of the operating element in which it is formed.

3. A tool for cutting sheath electric cables in accordance with claim 1, wherein said groove is angled with respect to the axis of the operating element in which it is formed, and each end of the groove extends through an edge of the operating element providing an open ended groove.

4. A tool for cutting sheath electric cables, comprising a pair of operating elements pivotally mounted together, said operating elements including rearward hand grasping sections and an inwardly directed jaw formed on the forward end of each operating element, the jaws being in engagement when the hand grasping sections are pivoted together, the opposing edges of said jaws being provided with substantially semi-circular cutting edges and the semi-circular cutting edges of one jaw being aligned with and complementary to the semi-circular cutting edges on the other jaw forming substantially circular openings through the jaws when they are in engagement, the opening being adapted to receive the insulated conductors of the sheath electric cable when the sheath is being cut by said cutting edges, and at least one of said operating elements being provided with a groove in the exterior surface thereof between said jaw and said grasping section, said groove adapted to receive a sheath electric cable therein for positioning the conductors in the openings.

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