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WIRE STRIPPING TOOL

This invention relates to tools for stripping insulation from insulated cables such as coaxial or multiple conductor cables, and is especially applicable to a tool that can be used to strip insulation from cables used in telephone systems.

Wire stripping tools are utilized extensively in removing the insulation from multiple conductor or coaxial cables. These tools take on many different kinds of configurations dependent upon the type of cable being stripped. A tool which has found use in this regard is described in U.S. Patent No. 4,130,031. This tool is small and compact but it is a complicated tool that requires several interactive parts. Furthermore, adjustments are required on the above-described tool to insure that the proper cutting depth of the knife blade is attained.

Wire-stripping tools are utilized extensively in the installation of telephone equipment in a home or business environment. In addition, more and more customers are, or are likely to be, installing telephone equipment within their establishments themselves. Therefore, a need has arisen for a tool that can be utilized in a simple fashion to install telephone wiring within the home or business environment. Furthermore, the tool should be one which is compact (i.e. can be carried around in the pocket of the user), and is safe

to use and also safe to carry. Finally, the tool should be relatively inexpensive so that it is readily obtainable by the customer.

According to the present invention there is provided a tool
5 for stripping insulation from an insulated cable comprising a cable support assembly, cutting means for cutting an incision in the insulation of an insulated cable when positioned in the assembly, and resilient means mounted on the cable support assembly and interacting therewith to form a bistable configuration, having a
10 first stable position in which the resilient means is spaced from the cable support assembly to facilitate the positioning of an insulated cable in the cable support assembly and a second stable position in which the resilient means resiliently holds the insulated cable in the assembly and resiliently biases the cable
15 against the cutting means.

In accordance with an embodiment of the invention a tool for stripping insulation comprises an assembly made of a light weight material with a knife blade embedded within it. There is a slot in the assembly that retains the knife blade such that a portion of the
20 knife blade is exposed. In addition this slot receives the insulated cable to be stripped. A compliant member preferably made from a resilient spring is connected to the assembly. This spring performs two functions: (1) it holds the insulated cable within the slot of the assembly and (2) it forces the cable against the knife
25 blade to facilitate cutting an incision in the insulation.

The spring is attached to the support assembly such that it can be moved from a position above the slot, which position allows the cable to be placed in the slot, to a position where the cable is biased against the knife blade in the slot. Thus, by the
30 application of pressure of the spring against the insulated cable the knife blade penetrates the insulation. This embodiment contains a ring or eye in which the user can insert a finger and thereby twirl the tool around to effect rotation of the tool around the cable to cut through the insulation over its entire circumference.
35 Thereafter the cable can be pulled

away from the tool thus removing the insulation therefrom.

An exemplary embodiment of the invention will now be described, reference being made to the accompanying drawings, in which:

5 FIG. 1 is a perspective view of a wire stripping tool in accordance with the present invention;

 FIG. 2 is a side view of the tool of FIG. 1;

 FIG. 3 is a side view of the tool of FIG. 1 with
10 the spring in the up position to accept an insulated cable;

 FIG. 4 is the same as FIG. 3 with the insulated cable in place;

 FIG. 5 is the same as FIG. 3 with the spring in the down position;

15 FIG. 6 is a top view of the tool of FIG. 1 of the invention; and

 FIG. 7 is the opposite side of the view depicted in FIG. 5.

 FIG. 1 is a perspective view of one embodiment of
20 a tool 14 in accordance with the present invention. Tool 14 could be utilized to strip the insulation from insulated cables, such as coaxial or multiple conductor cables dependent upon the size of the cable to be stripped.

25 FIG. 2 is a side view of the cable stripping tool. The tool comprises a support assembly 1 which can be made from a variety of materials. Plastic such as polycarbonate may be appropriate as it is lightweight and can easily be formed into the desired configuration
30 through a molding operation. Support assembly 1 has a channel 2 (shown by dotted line) running along its length to accept a retaining spring 5. Spring 5 has a loop portion 17 and a re-entrant latch portion 18 on one end for retaining the spring 5 in either an up or a down
35 position. The spring 5 in the down position as in FIG. 2 rests in the channel 2.

 The spring 5 is an integral part of the support
38 assembly 1 and is connected to and encased by the support

assembly such that it cannot be removed. The tool 14 in this embodiment is made in two pieces 19 and 20 (FIG. 6). The spring 5 is sandwiched therebetween. Thereafter the halves 19 and 20 are joined together by ultrasonic welding or some other joining technique thereby trapping the spring between the halves at the point shown by the dotted line 21. The spring 5 can then swivel easily from a position above the channel 2 to a position in the channel. The retaining spring 5 can be made of any compliant material that will exert some pressure on the cable while the insulated cable rests in a semicircular slot 4 formed in a laterally extending flange 3 (FIG. 1). Semicircular slot 4 accommodates the insulated cable to facilitate the stripping operation.

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Embedded within the support assembly is knife blade 7 in which area 8 of blade 7 which is within slot 4 is exposed such that it can penetrate the insulation of the cable when sufficient pressure is applied to the cable.

5 The blade 7 of the support assembly 1 is trapped in much the same manner as spring 5. The insulated cable (FIG. 4) sits in slot 4 which contains the exposed section 8 of knife blade 7. At one end of support assembly 1 is a ring 6 for allowing the user to twirl the tool on his or
10 her finger to effect relative rotation of the tool and cable.

In FIG. 2, the retaining spring 5 is in the "down" position. Thus, the tool can be carried in the hand or on the person of the user safely as it is virtually
15 impossible for the user to be exposed to the sharp knife edge of the tool. The spring 5 is retained in the down position in this embodiment by the interaction of the latch portion 18 with the underside of a protrusion 10 on the support assembly 1, the latch portion being biased against
20 the protrusion by the loop portion 17. Protrusion 10 in this embodiment is a semicircular hub which latch portion 18, due to the loop portion's 17 compliant qualities, snaps around and is locked in place. The spring 5, therefore, will not move from its position (down)
25 unless an outward force (in this case to the left) is applied to the latch portion 18 of spring 5.

FIG. 3 is the inventive embodiment with the spring in the "up" position, thereby allowing for insertion of the insulated cable in the slot 4. The spring 5 remains
30 in the "up" position because the latch portion 18 is captured between the upper surface of the protrusion 10 and an ear 16 extending outwardly adjacent to the upper surface. The loop portion 17 biases the latch portion 18 into the recess between these two elements. In addition,
35 ear 16 prevents this end of spring 5 from swinging freely above the tool 5.

FIG. 4 shows the cable 12 located within the slot 4 of the tool. As is readily apparent, the exposed portion 8 of the knife blade 7 is in contact with the insulation of cable 12. Thereafter the spring 5 is pushed down to bias the cable against the exposed portion 8 of the knife blade 7 and to apply pressure thereto. FIG. 5 shows the spring 5 in the down position with the knife blade cutting through the insulation of the cable 12. As stated above, the interaction between the latch portion 18 and the protrusion 10 holds the spring 5 in position. The user can then insert his or her finger into ring 6 and thereafter twirl or rotate the tool around to effect relative rotation of the tool 14 and the cable 12 to cut through the insulation over its entire circumference.

After the insulation is cut, then the cable 12 is pulled out of the tool while the spring 5 is still clamping the cable such that the insulation is stripped from the cable and the core or multiple cables are exposed.

Spring 5 therefore performs two functions:

1. it holds the cable within the slot of the assembly, and
2. it also biases the cable against the knife blade so as to keep pressure thereon.

Spring 5 furthermore can be made from a material that is flexible enough to accommodate varying sizes or gauges of cable.

FIG. 6 is a top view of the inventive embodiment which shows a portion of the wire stripping tool 14 that accommodates the insulated cable 12. It can be seen from this Figure that the spring 5 is over the cable, therefore holding the cable in position.

Thus this tool could find use in a variety of applications of stripping insulation from coaxial or multiple conductor cables. Similarly, this tool will accommodate different sizes of cables, dependent upon the flexibility of the spring. In addition, looking at the reverse side the tool in FIG. 7, a scale located on this

side can be used to measure the length of cable to be stripped. Looking at the side of the tool in which the numbers 1 through 3 are designated, it should be noted in this embodiment these numbers correspond to inches of cables to be measured. However, these markings can be any unit of measure. Typically, an insulated cable can be measured to determine the amount of insulation that is to be removed. Thereafter the insulation stripping operation can take place to allow the cable to be connected to its terminal point.

In addition, the tool 14 has a rectangular hole 22 at one end to position staples (not shown) that will be used for nailing cable to a baseboard, etc. A staple is held in the hole 22 by friction, and thus the staple can be hammered into place without having to be held by the fingers of the user. Finally, the tool 14 has a notch 23 at its other end to break out a thin section in the side wall of a surface mounted connecting block to provide an opening through which a cable can pass. Such a connecting block is used to electrically connect telephone equipment to the cable.

Therefore, the wire stripper of FIGS. 1 through 7 is a multipurpose tool that can be used to accomplish four tasks:

1. measuring the insulated cable,
2. stripping the insulation from the cable,
3. stapling the cable in place, and
4. providing a passageway in a connecting block for the cable.

The tool, described in the above-mentioned Figures, will find use extensively in the telephone industry. With consumer installation of telephone equipment increasing, this will be a useful, safe and simple to use tool that is a helpful addition to any package of tools to be used in conjunction therewith. In addition, this tool can accommodate varying cable sizes dependent upon the compliancy of the spring that holds the

insulated cable in the body of the tool. Typically, this cable stripper could be part of a package of simple to use tools to install telephones or telephone systems.

While this invention has been disclosed by means of specific illustrative embodiments, the principles thereof are capable of a wide range of modification by those skilled in the art. Thus, while the spring 5 and knife blade 7 have been disclosed as discrete components mounted on the support assembly 1, the support assembly 10 could be molded as a unitary member that includes these elements.

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CLAIMS

1. A tool for stripping insulation from an insulated cable comprising a cable support assembly, cutting means for cutting an incision in the insulation of an insulated cable when positioned in the assembly, and resilient means mounted on the cable support assembly and interacting therewith to form a bistable configuration having a first stable position in which the resilient means is spaced from the cable support assembly to facilitate the positioning of an insulated cable in the cable support assembly and a second stable position in which the resilient means resiliently holds the insulated cable in the assembly and resiliently biases the cable against the cutting means.

2. A tool as claimed in claim 1, in which the support assembly comprises a body member, and a channel within said member and running along the length of the member for accommodating the resilient means and a circular ring at one end of the member for effecting rotation of the tool around the cable to cut through the insulation over its entire circumference.

3. A tool as claimed in claim 2, in which the cable support assembly further comprises a semicircular slot within a support for holding the insulated cable.

4. A tool as claimed in claim 3, in which the support for holding the insulated cable is a flange.

5. A tool as claimed in claim 3, or claim 4, in which the cutting means is a knife blade embedded within the body member and the knife blade is exposed to the cable in the slot.

6. A tool as claimed in any preceding claim, in which the resilient means is a pre-shaped spring wire.

7. A tool as claimed in claim 6, in which the spring wire is provided with a loop portion at one end by means of which it is rotatably supported in the cable support assembly.

8. A tool as claimed in claim 7, in which the spring wire is provided with a re-entrant latch portion at the other end thereof which co-operates with the cable support assembly for retaining the spring wire in its first and second stable positions.



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9. A tool for stripping insulation substantially as
hereinbefore described with reference to the accompanying drawings.

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