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A HAND-HELD CABLE-STRIPPING TOOL

FIELD OF INVENTION

The present invention relates to cutting tools and more particularly to cable-strippers for removing the insulation from cables, wires and the like. A hand-held cable-stripping tool is used to cut the outer insulation layer of a cable along its circumference and/or along its longitudinal axis. The cable-stripping tool uses two guide-bars to guide the cutting-blade located in between the guide-bars and which can be manually rotated around the central longitudinal axis of the tool to make the cuts as the cable-stripping tool is pressed and moved against the cable by the user.

The cable-stripping tool will ensure that the outer insulation layer of the cable is cut safely and uniformly without damaging the internal wires or insulation of the cable.



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BACKGROUND OF THE INVENTION & PRESENT STATE OF THE ART

The simplest way to strip the outer insulation layer of a cable is to use a blade or knife to make a cut along the longitudinal axis of the cable and then make another cut along the circumference of the cable at the end of the longitudinal cut. However, this exposes the user's hand to the danger of being cut accidentally as he has to grip the cable with one hand while pressing the blade against the cable with the other hand. This danger is increased when the cable is installed in a confined or dark space or in a vertical position whereby it is difficult to grip the cable. Also, the cut may not be uniform or straight, resulting in potential damage of the internal wires or insulation of the cable.

In order to ensure the safe and uniform cutting of the insulation of the cables, various tools had been developed, from the simplest hand-held tool to the more complicated stationary tools. Patents US6308417, US6330839 and WIPO-PCT publication WO02/15353 depict the complicated, heavy and stationary tools. Hand-held tools with clamping jaws or tongs with sharp or cutting-blade edges are described in patents CA430075, US6220119, US2002004984, GB2359671 and WIPO-PCT publication WO98/38713. However, due to the construction of these tools, these tools can be more suitably used for smaller cables.

Patents CA430075 and CA1023534 describe tools with rollers and a cutting edge. Patents US6247235 and WIPO-PCT publication WO01/19550 describe tools with two cutting edges. Patent CA1023925 describe a tool with a spring-loaded cable-receiving holder and a cutting-blade which can be freely rotated according to the motion of the tool as the tool is used to make cuts along the circumference and longitudinal length of the cable.

OBJECTS OF THE INVENTION

It is an object of the present invention to create a small, lightweight and portable cable-stripping tool which is easy and safe to use.

It is another object of the present invention to create a cable-stripping tool whose guide-bars are used to guide the cutting-blade to ensure that the outer insulation layer of the cable is cut in a straight and uniform manner without damaging the internal insulation layers or wires of the cable.

It is yet another object of the present invention to create a cable-stripping tool whose cutting-blade can be manually rotated around the central longitudinal axis of the cable-stripping tool to make cuts along the circumference of the cable and along the length of the cable when the cable-stripping tool is pressed and moved against the body of the cable along its circumference and along its length respectively.

It is also yet another object of the present invention to create a cable-stripping tool whereby the force for the cutting action is applied directly through the user's grip on the handle of the cable-stripping tool.

SUMMARY OF THE PRESENT INVENTION

The present invention of the cable-stripping tool uses two guide-bars which are held by the central body of the tool to guide a cutting-blade located in between the guide-bars to make uniform and straight cuts on the outer insulation layer of the cable. The cutting-blade which is also held by the central body of the cable-stripping tool can be manually rotated around the central longitudinal axis of the tool in the following manner: -

- when the tool is used to cut along the circumference of the cable, the edge of the cutting-blade is adjusted to be in the same plane as the plane formed by the two guide-bars and the central longitudinal axis of the central body of the tool
- when the tool is used to cut along the length of the cable, the edge of the cutting-blade is adjusted to be perpendicular to the plane formed by the two guide-bars and the central longitudinal axis of the central body of the tool.

The two guide-bars form a V-shaped wedge with the central body of the tool with the cutting-blade at the center. The distance between the two guide-bars can be adjusted to cater for the different sizes of the cable to be cut.

A user of the cable-stripping tool can therefore simply grip the central body of the cable-stripping tool and then press the body of the tool (and therefore the cutting-blade) directly against the cable while the tool and cutting-blade is guided by the guide-bars. With the other hand holding the cable steady, the insulation of the cable can be cut in a safe and uniform manner.

The closest comparison of the cable-stripping tool of the current invention is described in patent CA1023925 of a tool with a spring-loaded cable-receiving holder and a cutting-blade which is freely rotated according to the motion of the tool as it makes cuts along the circumference and longitudinal length of the cable. However, the major differences are: -

- the tool described in CA1023925 uses a spring force acting on the cable-receiving holder to press the cable against the cutting-blade while the tool in the present invention uses a direct force from the user to press tool and hence the cutting-blade against the cable. This will ensure that uniform cuts can be made when the tool is held at different angles with respect to the user's body.
- the tool described in CA1023925 uses a cutting-blade which can be freely rotated and can align itself with the direction of the motion of the tool while the tool in the present invention uses a cutting-blade which is manually rotated around the central longitudinal axis of the tool in the following manner: -
 - when the tool is used to cut along the circumference of the cable, the edge of the cutting-blade is adjusted to be in the same plane as the plane formed by the two guide-bars and the central longitudinal axis of the central body of the tool
 - when the tool is used to cut along the length of the cable, the edge of the cutting-blade is adjusted to be perpendicular to the plane formed by the two guide-bars and the central longitudinal axis of the central body of the tool.

The construction and function of the cable-stripping tool in the present invention will become obvious when it is described in detail in the next two sections.

BRIEF DESCRIPTION OF THE DRAWINGS

The advantages and objects of the present invention are summarized but not limited to the following drawings, the full scope of which are embodied in the appended claims of the present invention:-

FIG. 1 shows the horizontal plan view of the tool with respect to the cross-section of a cable (shown in the vertical position) and with the edge of the cutting-blade of the tool aligned to cut the insulation layer of the cable along its circumference.

FIG. 2 shows the horizontal plan view of the tool with respect to the cross-section of a cable (shown in the vertical position) and with the edge of the cutting-blade of the tool aligned to cut the insulation layer of the cable along its longitudinal length.

FIG. 3 shows the perspective view of how the tool and the cable are gripped by the hands of the user of the tool to cut the insulation layer of the cable.

DETAILED DESCRIPTION OF THE EMBODIMENTS OF THE INVENTION

The construction and operation of the cable-stripping tool of the present invention are described in briefly in this section. A person skilled in mechanical design and tooling will be able to design and construct such a cable-stripping tool without the use of specialized equipment or materials.

FIG. 1 shows the horizontal plan view of the tool **1** with respect to the cross-section of a cable **16** (shown in the vertical position with respect to the page) and with the edge **6** of the cutting-blade **5** of the tool **1** aligned to cut the insulation layer **15** of the cable **16** along the circumference of the cable **16**.

The tool **1** has a central body **2** which houses the following: -

- guide-bars **3, 4** which are held at a symmetrical distance from the central longitudinal axis **17** of the tool **1**, such that the longer ends **13, 14** of the guide-bars **3, 4** respectively form a V-shaped wedge pressing against the cable **16** while the shorter ends **11, 12** of the guide-bars **3, 4** respectively form another V-shaped wedge pressing against the wedge-shaped adjusting knob **10**. The guide-bars **3, 4** form a common plane **18** (same plane as the page) with the central longitudinal axis **17** of the tool **1**.
- Rod **7** which holds the cutting-blade **5** along the central longitudinal axis **17** of the tool **1**. Moreover, rod **7** has a screw-threaded surface with adjusting knobs **9, 10** mounted on it.
- Metal catches **20, 21** which act as springs to push open the V-shaped wedge formed by the longer ends **13, 14** of the guide-bars **3, 4** respectively

The central body **2** also serves as a handle for the user to grip when using the tool **1**.

An adjusting mechanism adjusts the distance between the guide-bars **3, 4** of the tool **1** in order to cater for the different sizes of cable **16** and works as follows: -

- the guide-bars **3, 4** are similarly shaped and held by central body **2** in such a way that the central body **2** forms a pivot for each of the guide-bars **3, 4**.
- Rod **7** has a screw-threaded surface along which the wedge-shaped adjusting knob **10** can be tightened (moving towards the central body **2**) or loosened (moving away from the central body **2**) as the wedge-shaped adjusting knob **10** continually presses against the shorter ends **11, 12** of the guide-bars **3, 4** respectively.
- When the wedge-shaped adjusting knob **10** is tightened along rod **7** (moving towards the central body **2**), the V-shaped wedge formed by the shorter ends **11, 12** of the guide-bars **3, 4** respectively is enlarged causing the V-shaped wedge formed by the longer ends **13, 14** of the guide-bars **3, 4** respectively to become narrower to cater for a smaller-sized cable **16**. Metal catches **20, 21** are compressed proportionately resisting the inward movements of the longer ends **13, 14** of the guide-bars **3, 4** respectively.
- When the wedge-shaped adjusting knob **10** is loosened along rod **7** (moving away from the central body **2**), the V-shaped wedge formed by the shorter ends **11, 12** of the guide-bars **3, 4** respectively is narrowed causing the V-shaped wedge formed by the longer ends **13, 14** of the

guide-bars **3, 4** respectively to become enlarged to cater for a larger-sized cable **16**. Metal catches **20, 21** are released proportionately and their spring-forces push the longer ends **13, 14** of the guide-bars **3, 4** respectively away from the central longitudinal axis **17** thereby forcibly narrowing the V-shaped wedge formed by the shorter ends **11, 12** of the guide-bars **3, 4** respectively which continually maintain contact with the wedge-shaped adjusting knob **10** as the wedge-shaped adjusting knob **10** is moved along rod **7** away from the central body **2**.

An adjusting mechanism allows the manual rotation of the edge **6** of the cutting-blade **5** and works as follows: -

- the rod **7** holds the cutting-blade **5** along the central longitudinal axis **17** of the tool **1**. The rod **7** passes through the central body **2** and is fixed by a set of locking bolts **8** on both sides of the central body **2**. The locking bolts ensure that the edge **6** of the cutting-blade **5** can only be locked in two positions, which are orientated 90 degrees from each other.
- a knob **9** is fixed at the end of the rod **7** to allow the manual rotation of the blade from one locked position to the other.
- the edge **6** of the cutting-blade **5** is in the same plane **18** as the plane formed by the guide-bars **3, 4** and the central longitudinal axis **17** (same as the page). The cable **16** is shown perpendicular to the plane **18**.

In order to make a cut of the insulation layer **15** along the circumference of the cable **16**, the tool **1** is moved in the anti-clockwise direction **19** in the plane **18**.

FIG. 2 shows the similar orientation of the tool **1** with respect to the cable **16** as in **FIG.1**, except that the edge **6** of the cutting-blade **5** of the tool **1** is aligned perpendicular to the plane **18** and is positioned to cut the insulation layer **15** of the cable **16** along its longitudinal length, perpendicular to the plane **18** (marked by the direction **22**, perpendicular to the page).

FIG. 3 shows the perspective view of how the tool **23** and the cable **24** are gripped by the hands **29**, **30** of the user of the tool **23** respectively to cut the insulation layer of the cable **24** along a longitudinal axis **25**. The left hand **30** of the user grips the cable **24** while the right hand **29** of the user grips the tool **23**. The two guide-bars **26**, **27** of the tool **23** guide the cutting-blade **28** along the longitudinal axis **25** of the cable **24** as the tool **23** is moved away from the user's left hand **30**.

With the guide-bars **26**, **27**, it then becomes easy and safe to make cuts in the insulation layer of the cable **24** that are straight and uniform in depth without damaging the internal insulation or wires of the cable **24**.

CLAIMS:

What is claimed is:-

1. A hand-held cable-stripping tool which is used to cut the insulation layer of a cable along the circumference of the said cable and/or along the length of the said cable, consisting of: -
 - a central body with a central longitudinal axis
 - two guide-bars held together by the said central body of the said cable-stripping tool at an opposite symmetrical distance along the said central longitudinal axis of the said central body of the said cable-stripping tool
 - a cutting-blade held by the said central body of the said cable-stripping tool along the said central longitudinal axis of the said central body of the said cable-stripping tool in between the said guide-bars
 - an adjusting mechanism for manually adjusting the distance between the said guide-bars to cater for different sizes of the said cable
 - an adjusting mechanism for manually rotating the angle of the edge of the said cutting-blade around the said central longitudinal axis of the said central body of the said cable-stripping tool.
2. The said cable-stripping tool as in **Claim 1** whereby the said guide-bars are used to press against the body of the said cable and to guide the said cutting-blade when the said cable-stripping tool and hence the said cutting-blade are pressed directly against the said body of the said cable during the cutting action.

3. The said cable-stripping tool as in **Claim 1** whereby the edge of the said cutting-blade can be manually rotated at an angle around the said central longitudinal axis of the said central body of the said cable-stripping tool in the following manner: -
 - when the said cable-stripping tool is used to cut along the circumference of the said cable, the edge of the said cutting-blade is manually adjusted to be in the same plane as the plane formed by the said two guide-bars and the said central longitudinal axis of the said central body of the said cable-stripping tool
 - when the said cable-stripping tool is used to cut along the length of the said cable, the edge of the said cutting-blade is manually adjusted to be perpendicular to the plane formed by the said two guide-bars and the said central longitudinal axis of the said central body of the said cable-stripping tool.
4. The said cable-stripping tool as in **Claim 1** whereby the said central body of the said cable-stripping tool also serves as a handle for the user to grip during the cutting action.