United States Patent [19]

Schlueter

[11] **3,800,418**

[45] **Apr. 2, 1974**

[54] **WIRE STRIPPER**

[76] Inventor: **Donald K. Schlueter,** Box 40, Farley, Mo. 64028

[22] Filed: **July 10, 1972**

[21] Appl. No.: **270,092**

[52] **U.S. Cl.** **30/91.2**
[51] **Int. Cl.** **B26b 27/00**
[58] **Field of Search** ..... 30/90.1, 90.4, 90.6, 90.7, 30/90.8, 90.9, 91.1, 91.2, 94; 81/9.5 R, 9.5 A, 9.5 B, 9.5 C

[56] **References Cited**

UNITED STATES PATENTS

2,903,064	9/1959	Blonder	30/90.6
2,507,187	5/1950	Terry	30/94 X
1,692,030	11/1928	Friedman	30/90.6
2,835,031	5/1958	Cook	30/90.6

FOREIGN PATENTS OR APPLICATIONS

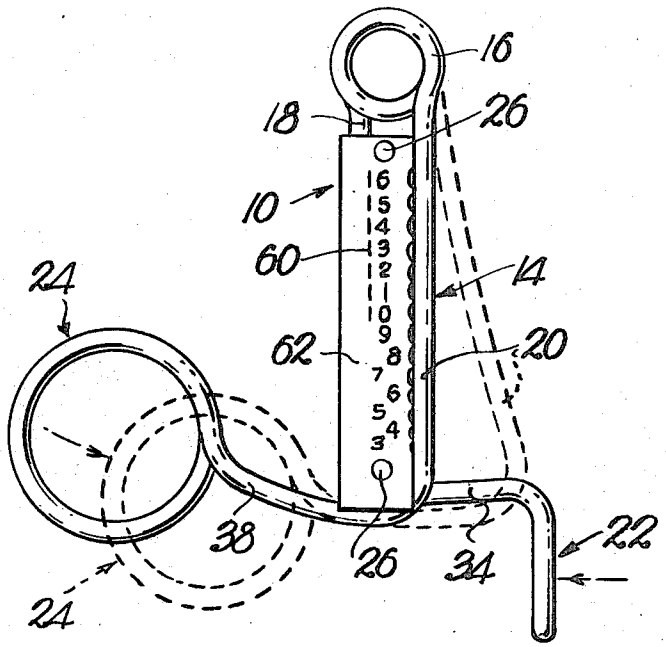
1,011,494	7/1957	Germany	30/91.2

Primary Examiner—James L. Jones, Jr.
Assistant Examiner—Mark S. Bicks
Attorney, Agent, or Firm—Schmidt, Johnson, Hovey & Williams

[57] **ABSTRACT**

A cutter blade is mounted in a cutter block such that the cutting edge of the blade intersects a series of transverse grooves in the block, the grooves being of various depths and widths to accommodate electrical wiring covered with insulation of differing thicknesses. A spring loaded arm maintains pressure on the wiring as the block is rotated around the conductor of the wiring to form an annular cut in the insulation of the wiring. The cut around the conductor ceases when the wiring bottoms out in the selected groove before the cutting edge can engage the conductor. The pressure arm is a part of a single length of rod material which also includes a coil to spring load the arm and a pair of hand grips to control the arm, one of the grips serving as a finger-receiving ring used to rotate the block.

4 Claims, 7 Drawing Figures



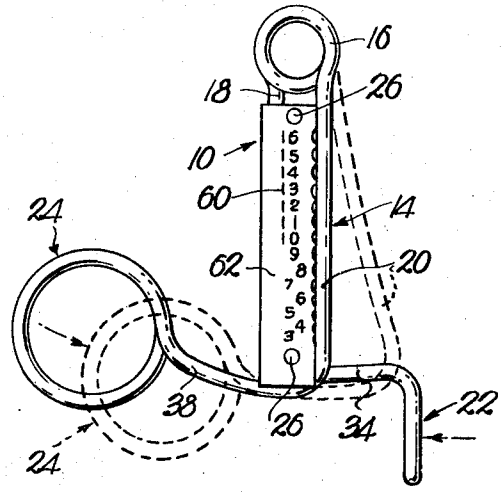


Fig. 1.

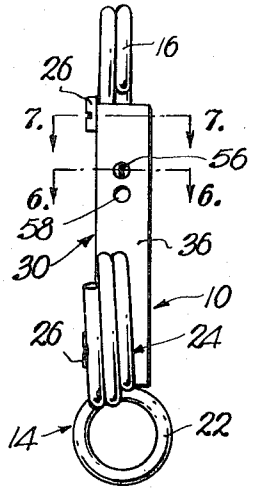


Fig. 2.

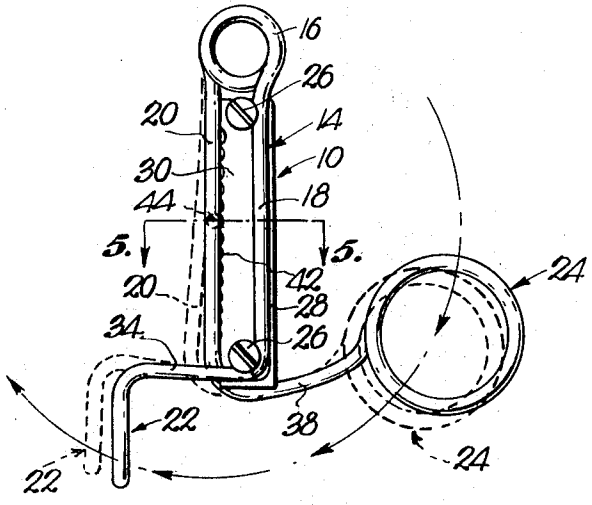


Fig. 3.

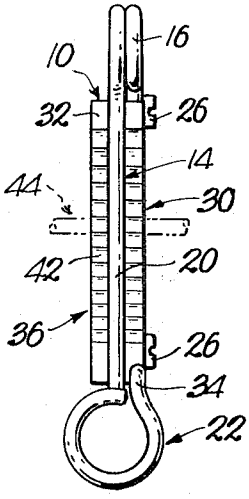


Fig. 4.

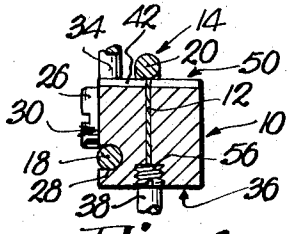


Fig. 6.

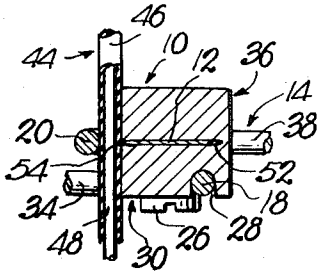


Fig. 5.

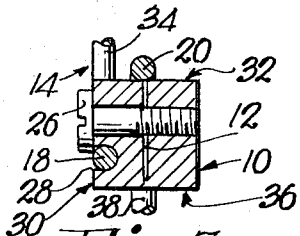


Fig. 7.

WIRE STRIPPER

In all previously suggested wire strippers of which I am aware, it is virtually impossible, without extreme care and time-consuming attention, to effectively and consistently sever the insulation completely around the electrical conductor while, at the same time avoid all cutting, nicking, scratching or other damage to the conductor itself, causing a weakening such as to create a potentially troublesome point in the conductor. Almost any contact by the cutter with the metal conductor while the insulation is being cut will result in the danger of circuit breakage upon separation of the metal at the zone of damage resulting from stresses and strains, particularly vibration.

One area in which unusual painstaking and watchful concern becomes extremely important is in aircraft, employing thousands of circuits, many of which are critical from the standpoint of safety. Vibration is ever present, resulting in frequent circuit breakage, and in a very high percentage of such cases, the trouble occurs at the very area where insulation severence had taken place during installation. Carelessness is a factor to be expected; therefore, the tool used by workmen must be most reliable, leaving no opportunity for error, misuse or failure.

Moreover, a completely satisfactory wire stripper, in addition to accuracy, must be easy to use, capable of permitting the task to be accomplished quickly, and small enough to be used in confined spaces and locations that are not readily accessible. Otherwise craftsmen will discard the tool in an effort to find a better way or use it in a manner which will not accomplish the perfection which is required. It is not unusual for trouble spotters and repairmen to spend many, many expensive hours in the location of but one break among the extremely large number of electrical wires in an airplane or other machines and instruments used commercially and in industry generally. Manifestly, in many areas, such as missiles, rockets, telemetry and other modern day instrumentation, subsequent repair cannot be considered; initial trouble-free installation must be critically absolute.

It is, therefore, the primary object of the present invention to provide a wire stripper which will meet all of the specifications above indicated and solve many, many problems heretofore presented through use of devices and methods heretofore devised for use or experimentation.

An important object of the present invention is to provide a wire stripper which will accommodate a large number of wires of differing insulation thicknesses and, in each case, fully sever the insulation entirely around the conductor without contacting the latter, and therefore, in complete absence of any damage thereto whatsoever.

Another important object of the present invention is to provide a wire stripper which incorporates a certain degree of automation in that the necessary pressure to cause full severence without conductor damage is not dependent upon the grip of the user which, of course, is variable and essentially impossible to control.

Still another important object of the present invention is to provide a wire stripper which requires no skill of any kind on the part of the user and which will operate with resultant perfection repeatedly over a long period of time, the only normal tasks being the simple insertion of the insulated wire in place and the spinning of the tool around the wire.

A further object of the present invention is to provide a small, safe, inexpensive, light weight, easy to use and manufacture wire stripper which may be conveniently and quickly manipulated in the smallest of available working spaces.

In the drawing:

FIG. 1 is a side elevational view of a wire stripper made according to the present invention;

FIG. 2 is a bottom view thereof;

FIG. 3 is a view showing the side thereof opposite to FIG. 1;

FIG. 4 is a top view thereof;

FIG. 5 is a cross sectional view taken on line 5—5 of FIG. 3; and

FIGS. 6 and 7 are cross sectional views taken on lines 6—6 and 7—7 respectively of FIG. 2.

The main components of the wire stripper shown in the drawing include an elongated cutter block **10**, a cutter blade **12** and a single length of initially straight, slender spring rod **14**. The rod **14** is formed into a coil **16** at one end of the block **10** having a pair of lengths **18** and **20** extending therefrom along the block **10** which, in turn, terminate in hand grips **22** and **24** respectively at the opposite end of the block **10**.

The heads of a pair of removable fasteners **26**, screw threaded into the block **10**, releasably hold the length **18** within a channel **28** extending longitudinally along one face **30** of the block **10** and constitute the sole attachment of the rod **14** to the block **10**. The length **20** of the rod **14** is in the nature of a swingable arm that is yieldably biased toward the longitudinal center line of the top **32** of the block **10** by the coil **16**.

The channel **28** is L-shaped to also accommodate a leg **34** extending laterally from the length **18**. The leg **34** terminates in the grip **22** which is in the nature of a loop that is disposed in a plane parallel with top **32** and bottom **36** of the block **10**. The arm **20** has a leg **38** extending laterally in a direction opposite to the leg **34**, and a depression in the proximal end of the block **10** receives a portion of the leg **38**. The leg **38** terminates in the ring shaped grip **24** which may, as shown, be in the nature of a second coil that is essentially coplanar with the coil **16** and adapted to receive a finger of the user of the wire stripper.

The top **32** of the block **10** has a series of transverse grooves **42** of various predetermined widths and depths, depending on the diameter of the electrical wiring **44** to be stripped of insulation **46** from the metallic conductor **48** thereof. The grooves **42** present alternate ribs **50** across the top **32** of the block **10** against which the arm **20** is held by the coil **16**.

The elongated, perforated blade **12** is disposed in a slit **52** in the block **10** and has a longitudinal cutting edge **54** traversing the grooves **42** medially of the latter, but projecting into the grooves **42** no farther than the thickness of the insulation **46**. The fasteners **26** pass through the blade **12** and releasably clamp it in place within the slit **52**. Small studs **56** (one only being shown) in the bottom **36** abut the base edge of the blade **12** to adjust the extent of protrusion of the edge **54** beyond the bottoms of the grooves **42**. A pin-receiving hole **58** in the bottom **36** of the block **10** facilitates removal of the blade **12** for replacement purposes. Upon removal of the fasteners **26** insertion of such pin in the hole **58** aids in forcing the blade **12** out

of the slit **52**. Indicia **60** on side **62** of the block **10** designate the sizes of the grooves **46** in accordance with the thicknesses of the insulation **46** of the various wirings **44** to be stripped.

OPERATION

The wire stripper is handled by inserting one finger through the grip **24** and pressing on the grip **22** with the thumb to move the grips **22** and **24** toward each other (see arrows in FIG. 1) and thereby swing the arm **20** away from the grooves **42** as shown by dotted lines in FIG. 1. The wiring **44** is then laid across the cutting edge **54** at the appropriate groove **42** as shown in FIG. **4**, whereupon the thumb pressure on grip **22** is released, causing coil **16** to return the arm **20** to a position clamping the wiring **44** against the edge **54**.

The tool is then rotated by the operator around the wiring **44** as the grip **24** rotates on his finger, causing the blade **12** to gradually effect an annular cut into the insulation **46** around the conductor **48** as the arm **20** maintains a pressure on the wiring **44**. The cutting action ceases when the wiring **44** bottoms out in the groove **42** and at that time the insulation **46** is completely severed without the edge **54** having come into contact with the conductor **48**. The cut-away and portion of the insulation **46** may then be stripped off the conductor **48** through use of the stripper or the arm **20** may be swung away to release the wiring **44** and the end portion stripped away by hand or otherwise.

In the tool chosen for illustration, insulation **46** having thicknesses which range from approximately 0.003 to 0.016 of one inch may be accommodated (see indicia **60**) on wiring **44** having an outside diameter of from about 0.007 to 0.1875 of one inch, but such dimensions for the grooves **42** are by way of example only. More important is the fact that the grooves **42** are chosen by the operator in accordance with insulation thickness rather than overall size of wiring **44** or diameter of conductor **48**.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A tool for cutting insulation surrounding metallic conductors of electrical wiring, said tool comprising:
- a cutter block having a groove of predetermined width and depth;
- a spring loaded arm carried by the block for pressing the wiring toward said groove; and
- a cutter blade carried by the block and having a cutting edge disposed to cut the insulation as the tool is rotated about the wiring,
- said block having a coil spring at one end thereof having a pair of lengths extending therefrom along the block,
- said arm being one of said lengths and having a grip extending laterally therefrom in one direction, the other length having another grip extending laterally therefrom in the opposite direction,
- said grips being at the opposite end of the block and squeezable toward each other to spring the arm away from the groove.

2. A tool as claimed in claim **1**, wherein the block is provided with a series of grooves of predetermined widths and depths underlying said arm.

3. A tool as claimed in claim **2**, wherein said blade traverses the grooves intermediate the ends of the latter, said edge of the blade being in aligned parallelism with said arm.

4. A tool as claimed in claim **1**, wherein said grip on the arm is a finger ring essentially coplanar with said coil and about which the tool may be rotated.

* * * * *