

[54] ELECTRICIAN'S KNIFE

[76] Inventor: Katsuyuki Nagaki, 26-1-chome  
Noenakano-cho, Joto-ku, Osaka,  
Japan

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[58] Field of Search ..... 30/154, 162;  
145/50 C, 64

[56] References Cited

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Primary Examiner—Othell M. Simpson

Assistant Examiner—Gary L. Smith

Attorney—Alvin Browdy

[57] ABSTRACT

An electrician's knife usable for wiring is disclosed in which the handle portion thereof comprises an integral thick insulation and a substantially flat tube which serves as a sheath for receiving a cutting blade adapted to be axially slidable therein but inseparable therefrom. The cutting blade is easily pulled out of the sheath by the fingers, but once pulled out, it is held stable by means of a pair of support pins and a stopper projection formed on a plate spring unless a pressing force is applied thereto.

7 Claims, 4 Drawing Figures

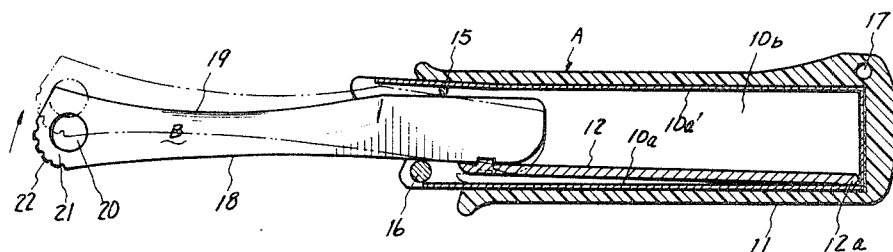


FIG. 1

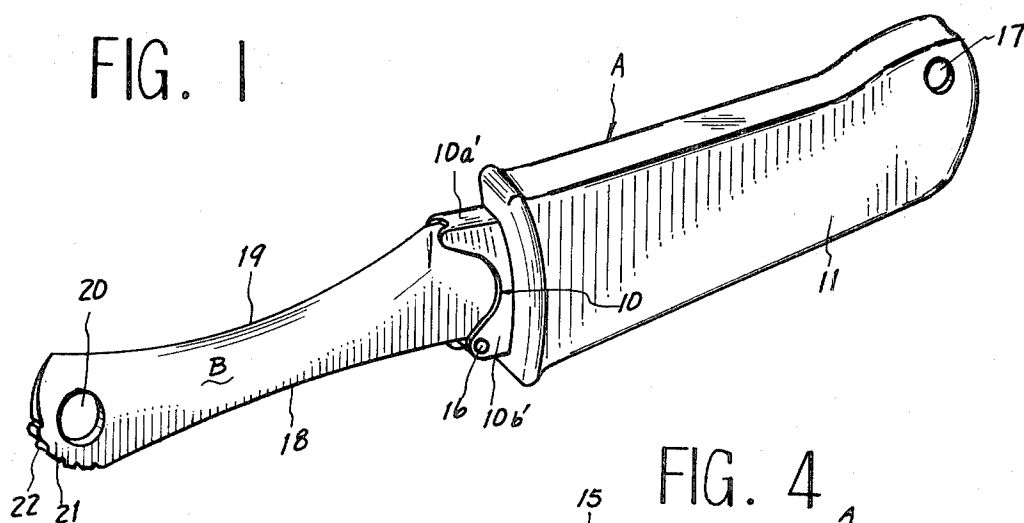


FIG. 4

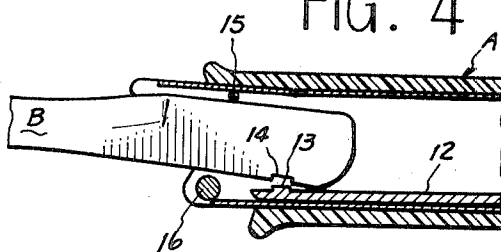


FIG. 2

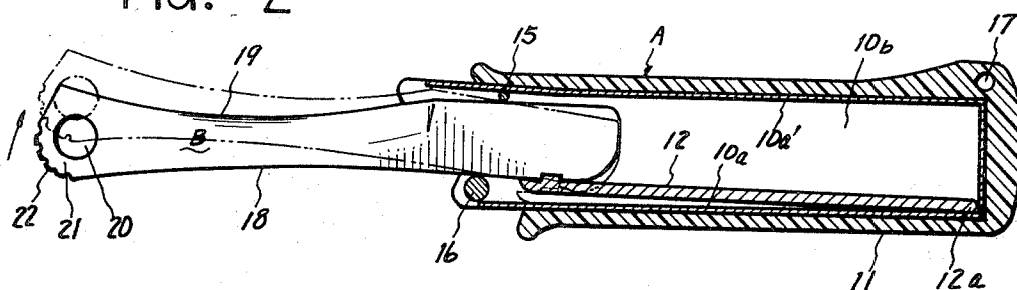
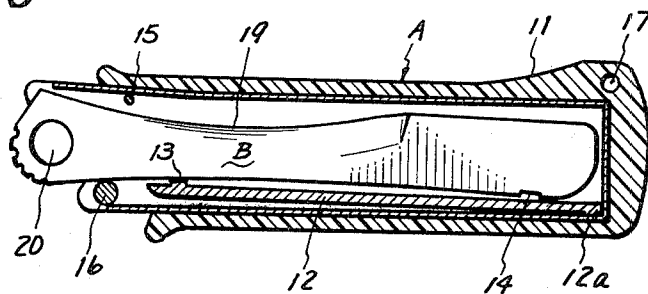


FIG. 3



## ELECTRICIAN'S KNIFE

The present invention relates generally to a cutting instrument for use in electric wire distributing work, and more particularly to such a sheath type electrician's knife that is mainly usable for stripping insulation from electric wires and cables or cutting them. The knife comprises a handle portion including a thick insulation for protecting the user from electric shock and a substantially flat metallic tube which serves as a sheath for storing the cutting blade which is adapted to be axially slidable therein but inseparable therefrom. The cutting blade can be easily pulled out in the axial direction of the sheath by fingers, but once pulled out it is held stable by means of a pair of support pins and a stopper projection formed on a plate spring unless a pressing force is given thereto.

Conventionally, most of the cutting instruments employed to strip insulation from electric wires and cables or cut them are clasp type knives according to which a cutting blade, when not in use, is pivotally supported with a hinge mounted adjacent one end of a slotted handle. On the other hand, the sheath type knives are rarely used in the field for the reasons to be described hereinafter.

When the above-mentioned conventional clasp type knife is employed, there is a fatal defect in that the cutting blade is accompanied by a jeopardy that a user will occasionally hurt himself because the cutting blade is liable to unexpectedly pivot back into the slotted handle.

Further, in such a clasp type knife, the handle portion must be provided longitudinally at one side with a slot for receiving the cutting blade; consequently, the tendency is generally evident that undesired electro conductive foreign matters produced during the operation and the moisture existing around a labor site are easily allowed to come in through said slot thereby forming an unexpected electrical connection causing dreadful electric shock.

Meanwhile, the conventional sheath type electrician's knives are rarely used in the field since they generally comprise a haft portion, a blade portion rigidly embedded or secured to said haft portion, and a sheath portion independently separable from said blade portion so that the sheath portion which, when in use, is generally separated from the unsheathed blade portion often gets lost.

Accordingly, the present invention aims at eliminating all the above-mentioned defects by providing a novel and useful electrician's knife that comprises a handle portion including a substantially flat tube servable as a sheath for slidably receiving a blade, and a thick insulation covering said sheath so that even if an electrician happens to work at a hot line charged with high voltage, he is safely protected against electric shock.

Another object of the invention is to provide an improved sheath type electrician's knife in which the foremost end of the cutting blade is thick and round, having a hole bored therethrough through or a pair of concavities formed therein making it possible for an electrician to easily pull the cutting blade out of the sheath with his fingers engaged in said hole or concavities.

A still further object of the invention is to provide an improved sheath type electrician's knife having a non-slip head provided adjacent the round corner of the

foremost end of the blade so that an electrician can easily push back the cutting blade into the sheath by pressing said non-slip head against a surface of any hard object accessible to him.

A yet further object of the invention is to provide an improved sheath type electrician's knife wherein stability of the pulled-out cutting blade is insured by a pair of support pins and a stopper projection formed on a plate spring for engaging with a recess formed in the back edge of the blade.

These and other objects and advantages of the present invention will become more apparent from the following description made with reference to a preferred embodiment of the invention shown by way of example in the accompanying drawing and the appended claims.

In the drawing:

FIG. 1 is a perspective view of an electrician's knife in accordance with the present invention, wherein the cutting blade is shown with its full length pulled out of the sheath;

FIG. 2 is an elevational view taken partly in section of the knife of FIG. 1, showing in phantom lines the positional relation assumed by the cutting blade when the non-slip head formed on the foremost end of the cutting blade is forcibly pressed;

FIG. 3 is likewise an elevation taken partly in section of the knife of FIG. 1, with the cutting blade fully sheathed; and

FIG. 4 illustrates in detail the elemental parts of the engaging mechanism formed with a stopper projection and a recess in the back edge of the blade.

Referring now to the drawing, the electrician's knife in accordance with the present invention comprises a handle portion generally designated by reference character A which includes a substantially flat metallic tube 10 servable as a sheath for slidably storing a cutting blade generally designated by reference character B and a thick insulation 11 covering said tube or sheath 10.

Said sheath has a pair of opposed narrow walls 10a, 10a', a pair of opposed comparatively broad walls 10b, 10b', and a bottom wall 10c. Along the inner surface of said narrow wall 10a there is provided a plate spring 12 which extends slopewise slightly upwardly away from said bottom wall 10c and is secured at one end to said wall 10a adjacent the bottom wall 10c by snapping its foremost bent portion 12a into a small slit (not shown in the drawing) provided in the wall 10a so that the back 18 of the cutting blade B is normally kept in an upwardly pressed state by the plate spring 12 as shown in FIGS. 2 and 3. In this connection, it will easily be understood that said bottom wall 10c may be omitted.

One end of said back edge 18 is notched with a recess or valley 14 having a configuration corresponding to an integrally formed projection 13 on the plate spring 12. Thus, when the cutting blade 10 is slidably pulled out of the sheath, said projection 13 is naturally brought into interlocked engagement with said recess or valley 14 thereby controlling the axial movement of the cutting blade 10 as is particularly shown in FIG. 2. In addition, the cutting blade B thus pulled out of the sheath 10 can be completely prevented from, the undesired counter-clockwise swinging movement, which otherwise may give rise to an excessive decrease of the cutting effect of the blade B, by means of a pair of support pins 15, 16 rigidly fixed in opposed relation with each other adjacent the opening end of the sheath 10, with

the outer pin 16 fixed opposite the blade back edge 18 and the inner pin 15 opposite the cutting edge 19. To be more precise, even if a pressing force or cutting resistance is applied to the cutting edge 19 to urge the blade B to turn counterclockwise about said outer pin 16, said inner pin 15 serves to keep the blade B unmoved thus securing the stability of the cutting blade B through the full course of the cutting operation.

In contrast thereto, when a pressing force is applied to the back edge 18 in the direction shown by an arrow in FIG. 2, the cutting blade B is urged to move about the inner pin 15 in said direction or the clockwise direction while at the same time the plate spring 12 is pressed downwardly by the rearmost end of the back edge 18 until it reaches the particular position shown in FIG. 4, wherein the stopper projection 13 of the plate spring 12 is caused to go out of the recess 14 of the back edge 18 with the result that the cutting blade B is completely released from the engaged relation with the plate spring 12 and is permitted to slide back into the sheath 10. Therefore, the cutting blade B can be stored back into the sheath 10, merely by pushing the blade B in the axial direction, with said stopper projection 13 disconnected from the recess 14 as is shown in FIG. 4.

The sheath 10 has its outer surface covered with a comparatively thick insulation 11 preferably made from a non-conductive synthetic resin with the exception of its opening end portion whereby a user is safely protected against possible electric shock even when working at a hot line.

Incidentally, a hole 17 may be provided at one end of the insulation so as to suspend the knife on a user's belt by passing a string on the belt through hole 17.

In the present embodiment, the foremost end of the cutting blade B is provided with a hole 20 so as to help a user pull out the blade B from the sheath 10 with the hole 20 between his finger tips. However, it is also possible to secure this pulling effect by replacing said hole 20 with a concavity or indentation (not shown) that will serve as a finger slip preventing means.

Further, said foremost end of the cutting blade B is preferably formed into a semi-circular shape having a non-slip head 21 provided with a plurality of notches or indentation 22 by means of which said head 21 is effectively pressed against a surface of any hard object accessible to him in order to disengage the stopper projection 13 out of the recess 14 formed in the blade B.

Preferably the cutting blade B is inwardly curved along its edge 19 as illustrated in FIGS. 1 to 4 inclusive so that the cutting edge 19 is kept out of touch with the inner support pin 15 in the course of the axial movement thereof, consequently obviating a fear that the edge 19 may become dulled.

As has been understood from the above description, the present invention provides a simple and inexpensive electrician's knife characterized in that the sheath portion is covered with a thick insulation and the cutting blade is slidable longitudinally thereof within the sheath portion, thus always protecting a user from electric shock and preventing him from hurting himself.

Although one form of the invention has been shown and described hereinabove by way of illustration, it will be understood that the invention is not to be limited to the exact construction shown and described, but that various changes and modifications may be made with-

out departing from the spirit and scope of the invention, as defined in the appended claims.

I claim:

1. An electrician's knife, comprising:

a handle including a substantially flat tube, open at one end, servable as a sheath, and an external insulation covering said sheath;

a cutting blade, having a cutting edge, a back edge, a foremost end and a rearmost end, axially slidable within said sheath but inseparable therefrom;

an outer support pin fixedly secured adjacent the open end of said sheath on the inside thereof opposite the back edge of said cutting blade;

an inner support pin fixedly secured adjacent the open end of said sheath on the inside thereof opposite the cutting edge of said cutting blade;

said inner support pin being located relatively inwardly within said sheath with respect to said outer support pin so that when in operation said cutting blade is prevented from swinging about said outer support pin;

a plate spring extending gradually upward in the direction of said open end of said sheath along the inner wall of said sheath opposite the back edge of said blade, said plate spring having one end fixedly secured to said sheath;

a stopper projection formed at the end of said plate spring adjacent the open end of said sheath and kept in abutment with the back edge of said cutting blade under the upward pressure of said plate spring;

a recess means formed on the back edge of said cutting blade for releasably engaging said stopper projection; and

said cutting blade having its one end supported on said inner support pin against the resiliency of said plate spring when said recess means is engaged with said stopper projection so as to be slightly swingable about said inner support pin thereby to release the interlocked engagement of said stopper projection with said recess means.

2. The electrician's knife, as set forth in claim 1, wherein

said external insulation is made of nonconductive synthetic material.

3. The electrician's knife, as set forth in claim 1, wherein said sheath is made of metal.

4. The electrician's knife, as set forth in claim 1, wherein

the cutting edge of said cutting blade has an inwardly curved surface.

5. The electrician's knife, as set forth in claim 1, wherein

the foremost end of said cutting blade is substantially round and provided with a plurality of notches.

6. The electrician's knife, as set forth in claim 1, wherein

said cutting blade has a finger slip preventing means at the foremost end thereof.

7. The electrician's knife, as set forth in claim 6, wherein

said finger slip preventing means is in the form of a hole bored through said foremost end of said cutting blade.

\* \* \* \* \*

UNITED STATES PATENT OFFICE  
CERTIFICATE OF CORRECTION

Patent No. 3,755,893 Dated September 4, 1973

Inventor(s) Katsuyuki NAGAKI

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 2, line 44, delete "slopeswise".

Signed and sealed this 12th day of February 1974.

(SEAL)  
Attest:

EDWARD M. FLETCHER, JR.  
Attesting Officer

C. MARSHALL DANN  
Commissioner of Patents