

[54] SWIVEL KNIFE

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[22] Filed: Apr. 11, 1974

[21] Appl. No.: 460,129

[52] U.S. Cl. 30/164.9; 30/317; 30/321;
30/337

[51] Int. Cl. B26b 1/02; B26b 5/00

[58] Field of Search 30/340, 329, 330, 331,
30/332, 333, 335, 336, 337, 338, 339, 342,
164.9, 317, 321, 276; 145/61 G, 61 EA

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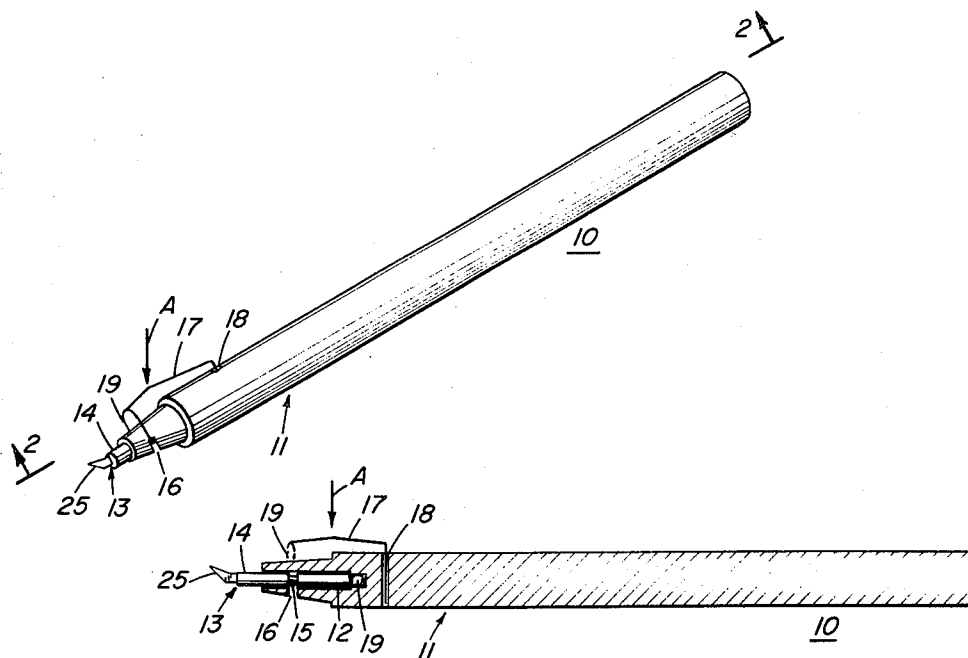
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[57] ABSTRACT

A swivel knife which has a blade unit comprising an elongated cylindrical body having a blade element at one end thereof, the body having an annular retaining groove. A housing is provided with an elongated passage extending longitudinally in one end thereof, the passage having a radius proportioned to rotatably receive the body of the blade unit. The passage has a length proportioned to receive at least a portion of the length of the body so that the blade element protrudes from the housing. A manually actuatable retaining means is mounted in the housing for engaging the annular groove to retain the body in the housing. When it is desired to remove the blade unit, the retaining means is manually actuated to disengage the groove to render the body removable from the housing. In one preferred embodiment of the invention the retaining means comprises a spring-bias wire mounted in the housing. In this embodiment the wire communicates with the groove through a slot in the housing.

2 Claims, 6 Drawing Figures



SWIVEL KNIFE

BACKGROUND OF THE INVENTION

This invention relates to cutting tools and, more particularly, to an improved swivel knife having a blade that is easily removable.

There have been previously devised many types of hand-held cutting tools for use by craftsmen such as draftsmen, artists, photographers, etc. The majority of such cutting tools employ a small blade that is rigidly mounted at the end of the tool. The blade is generally mounted in removable fashion to facilitate the changing thereof. Typically, the end of the tool is provided with a slit into which the blade is seated and a screw-on collet compresses the slit so that the blade is grasped. This rigidly-mounted type of knife is satisfactory for certain applications but has been found deficient in applications where it is necessary to cut curved shapes. The disadvantage stems from the need to continually twirl the fingers or lift the hand in order to impart the required curved impetus to the cutting blade.

Responsive to the described need there has been developed a type of cutting tool known as a "swivel knife" which employs a blade attached to a stem that is free to rotate within the housing of the cutting tool. Thus, as the craftsman's hand is moved around a curve, the blade will orient itself in the direction required for continued motion and the amount of twirling from the fingers or lifting of the hand that was previously necessary is substantially diminished. A problem with this type of tool is that provisions must normally be made for temporarily "locking" the stem with respect to the housing in order to remove the collet so that the blade can be changed. One conventional technique is to provide a small borehole through the stem which can receive a pin that is used to hold the stem stationary while the collet is removed or replaced. There are various other ways in which this function can be achieved, none of them being completely satisfactory however.

It is accordingly an object of this invention to provide an improved swivel knife having an easily changeable blade.

SUMMARY OF THE INVENTION

The present invention is directed to a swivel knife which has a blade unit comprising an elongated cylindrical body having a blade element at one end thereof, the body having an annular retaining groove. A housing is provided with an elongated passage extending longitudinally in one end thereof, the passage having a radius proportioned to rotatably receive the body of the blade unit. The passage has a length proportioned to receive at least a portion of the length of the body so that the blade element protrudes from the housing. A manually actuable retaining means is mounted in the housing for engaging the annular groove to retain the body in the housing. When it is desired to remove the blade unit, the retaining means is manually actuated to disengage the groove to render the body removable from the housing.

In one preferred embodiment of the invention the retaining means comprises a spring-bias wire mounted in the housing. In this embodiment the wire communicates with the groove through a slot in the housing.

Further features and advantages of the invention will become more readily apparent from the following de-

tailed description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an elevational perspective view of a swivel knife in accordance with an embodiment of the invention.

FIG. 2 is a cross-sectional view of the swivel knife of FIG. 1 as taken through a section defined by the arrows 2—2 of FIG. 1.

FIG. 3 is an elevational perspective view of a blade unit in accordance with an embodiment of the invention.

FIG. 4 is an exploded view of the blade unit of FIG. 3.

FIG. 5 is an elevational perspective view of the swivel knife in accordance with another embodiment of the invention.

FIG. 6 is a cross-sectional view of the knife of FIG. 5 as taken through a section defined by arrows 6—6 of FIG. 5.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIGS. 1 and 2 there is shown a swivel knife 10 in accordance with an embodiment of the invention. A housing 11 is provided with an elongated passage 12 that has a radius proportioned to rotatably receive a blade unit 13. The blade unit, also shown in FIG. 3, comprises an elongated cylindrical body 14 having a blade element 25 at an end thereof. The body 14, which may be formed of a rigid plastic material, has an annular retaining groove 15 therein.

The passage 12 has a length proportioned to receive most of the length of the body 14 so that the blade element 25 protrudes from the housing. In this embodiment the housing is provided with a slot 16 that is aligned with the groove 15 when the blade unit 13 is fully inserted in the housing. A spring wire 17 is mounted in the housing 11 by insertion in a small borehole 18. The wire terminates in a loop 19 (shown in dotted line in the cross section of FIG. 2) which encircles the housing at the position of slot 16 and acts to retain the blade unit 13 in position by engaging the annular groove 15 in the body 14 of the blade unit. When the blade unit 13 is inserted, the bias of wire 17 causes the wire loop 19 to hold the blade unit in place while the annular groove 15 allows free rotation of the entire blade unit so that effective operation as a swivel knife is achieved. A metal ball 19 is preferably press fit at the end of the passage 12 to act as a bearing and facilitate easy rotation of the blade unit 13. When it is desired to remove the blade unit 13, all that is required is that the wire 17 be pushed with a finger in the direction indicated by the arrow A. This action disengages the groove 15 and allows easy removal of the blade unit.

There are various alternate ways in which the blade unit 13 can be constructed. A preferred embodiment of the blade unit is shown in FIG. 4 which depicts a plastic body 14 having a substantially cylindrical opening 20 at one end which receives a metal blade element 25. The rear portion of the blade element 25 is a flange which is pressed fit into the passage 20. It is also possible to form the blade unit 13 out of an integral piece of cylindrical metal by machining the annular groove 15 and the blade element 25 by any suitable technique.

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FIGS. 5 and 6 show another embodiment of the invention which employs a different type of retaining means. A housing 31 is again provided with an elongated passage 32 which receives the blade unit 13 as described above. In this embodiment, a longitudinal slot 33 is provided in the housing 31 and the slot extends through to the passage 32 at a position which corresponds to the position of annular groove 15 of the blade unit when the blade unit is fully inserted. A thin metal lever 34 is mounted in the slot by a small pin 35 which defines a pivot position of the lever. The lever has a tooth 37 near its end, the tooth normally engaging the annular groove 15 to retain the blade unit in position. A small spring 36 biases the lever to its normal rest position. To remove the blade unit, a finger pressure in the direction indicated by the arrow B compresses the spring 36 so that the lever pivots and the tooth 37 disengages from annular groove 15.

We claim:

1. A swivel knife comprising:
a blade unit comprising an elongated cylindrical body

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having a blade element at one end thereof, said body having an annular retaining groove therein; a housing having an elongated passage extending longitudinally in one end thereof, said passage having a length proportioned to receive at least a portion of the length of said body so that said blade element protrudes from said housing, said housing having a slot at a position corresponding to the groove in said body; and

manually actuable retaining means comprising a single length of spring-bias wire mounted at one end in said housing and having a loop at its other end which communicates with said groove through said slot, said wire being manually actuable by bending against the bias thereof to disengage said groove to render said body removable from said housing.

2. A swivel knife as defined by claim 1 wherein said blade unit comprises a generally cylindrical plastic body having an annular groove therein and a blade having a rear flange press fit in said body.

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