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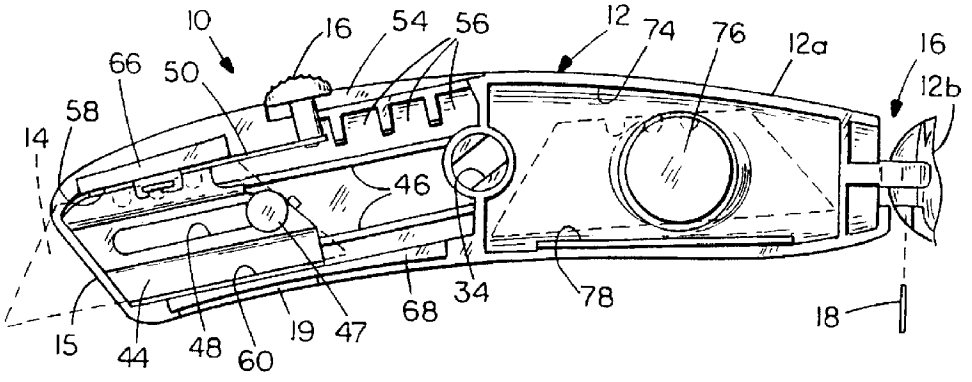
(12) (19) (CA) **Demande-Application**

(21) (A1) **2,264,565**
(86) 1998/06/30
(87) 1999/01/07

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(51) Int.Cl.[6] B26B 1/08, B26B 5/00
(30) 1997/06/30 (08/888,118) US

(54) **COUTEAU UNIVERSEL**
(54) **UTILITY KNIFE**



(57) Un couteau universel amélioré (10) comprend un manche (12) présentant des parties articulées fixées ensemble en position fermée par un cliquet déblocable (20). Une lame rétractible (14) et un porte lame (44) sont fixés et retenus mécaniquement à l'intérieur du manche (12). Un mode de réalisation (80) à lame fixe est également décrit.

(57) An improved utility knife (10) comprises a handle (12) having hinged sections secured together in the closed position by a releasable latch (20). A retractable blade (14) and blade carrier (44) are positively secured and retained within the handle (12). A fixed blade embodiment (80) is also disclosed.

PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 :		(11) International Publication Number:
B26B 1/08, 5/00	A2	WO 99/00224
		(43) International Publication Date: 7 January 1999 (07.01.99)

(21) International Application Number: PCT/US98/13770

(22) International Filing Date: 30 June 1998 (30.06.98)

(30) Priority Data:
08/888,118 30 June 1997 (30.06.97) US

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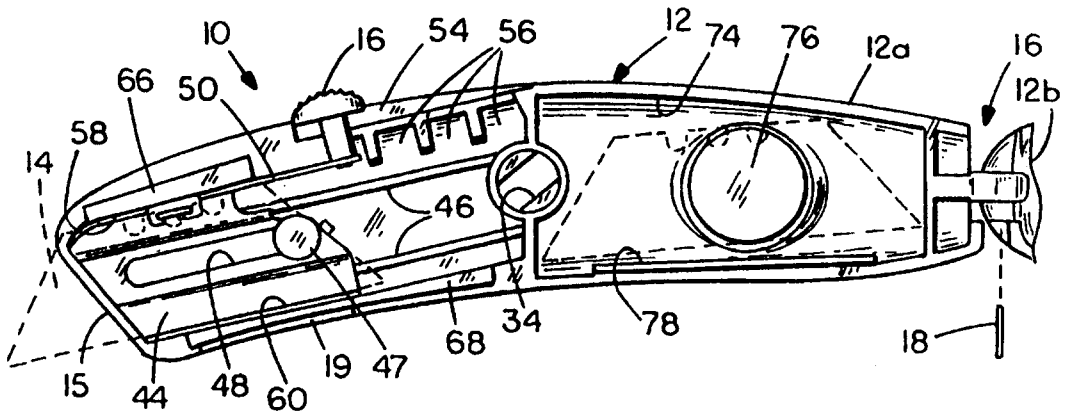
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(81) Designated States: AU, CA, CN, JP, MX, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).

Published
Without international search report and to be republished upon receipt of that report.

(54) Title: UTILITY KNIFE



(57) Abstract

An improved utility knife (10) comprises a handle (12) having hinged sections secured together in the closed position by a releasable latch (20). A retractable blade (14) and blade carrier (44) are positively secured and retained within the handle (12). A fixed blade embodiment (80) is also disclosed.

UTILITY KNIFE

Technical Field

The present invention relates generally to knives and knife handles. More particularly, this invention pertains to a new and unique utility knife of improved construction for more durability as well as more convenient use and operation.

Background Art

Utility knives are useful in a wide variety of applications, and many variations of such knives have been available heretofore. Such knives generally comprise a handle releasably secured about either a fixed or retractable blade, which can be replaced as necessary. Various blades for such knives have also been available.

Such utility knives are typically constructed for ease of replacement of the blades. However, two hands and careful attention and handling are typically required because the parts are usually secured together only when the knife is closed. It is not uncommon for at least some of the knife to come apart and require reassembly in the process of opening/closing it to change blades. This is inconvenient and unnecessarily time consuming and

frustrating. Some parts of utility knives are relatively small and can easily fall out and become lost. Moreover, this can be difficult and even unsafe when working in a precarious position, such as up on a roof, ladder or scaffold.

Another common problem with such utility knives relates to the manner in which the blades are supported and secured within the handle. In some knives of the prior art the blades can be twisted and become loose, and in some cases, even come out between the sections of the handle while working.

Some attempts have been made to address these problems. For example, one utility knife of the prior art has handle sections that are connected by a transverse central pivot. This avoids the problem of the handle coming apart, but does not address the problem of internal parts falling out when the handle is open.

A need has thus arisen for a new and unique utility knife of improved construction of greater durability as well as more convenient use and operation.

Summary of Invention

The present invention comprises a utility knife that overcomes the foregoing and other difficulties associated with the prior art. In accordance with the invention there is provided an improved utility knife having a handle with sections that are hinged together and secured in the closed position by a releasable thumb-actuated latch for actuation with one hand. The utility knife herein also incorporates various internal improvements for positively retaining the blade as well as the blade carrier therein. Provision is also made for positively retaining spare blades within the handle. Both retractable and fixed blade embodiments are disclosed.

Brief Description of Drawing

A better understanding of the invention can be had by reference to the following Detailed Description in conjunction with the accompanying Drawing, wherein:

Fig. 1 is a side view of a utility knife incorporating a first embodiment of the invention, shown closed;

Fig. 2 is an inside view of one side, shown open with the hinge pin exploded away and the blade shown in phantom lines;

Fig. 3 is an inside view of the other side, shown open;

Fig. 4 is an rear end view of the utility knife, shown closed;

Fig. 5 is an enlarged cross sectional view taken along lines 5-5 of Fig. 1 in the direction of the arrows;

Figs. 6 and 7 are partial sectional details showing the fastener in latched and unlatched positions, respectively;

Fig. 8 is an enlarged side view of the blade carrier with the blade shown in phantom lines;

Fig. 9 is a top view of the blade carrier;

Fig. 10 is a front end view of the blade carrier;

Fig. 11 is a side view of a utility knife incorporating a second embodiment of the invention, shown closed;

Fig. 12 is an inside view of one side of the handle, shown open with the hinge pin exploded away and the blade shown in phantom lines; and

Fig. 13 is an inside view of the other side of the handle, shown open.

Detailed Description

Referring now to the Drawing, wherein like reference numerals designate like or corresponding elements throughout the views, and particularly referring to Fig. 1, there is shown a utility knife 10 incorporating a first embodiment of the present invention. As will be explained more fully hereinafter, the knife 10 incorporates various improvements substantially enhancing operation and use.

The knife 10 includes a handle 12 with a retractable blade 14 which is movable between extended and retracted positions through a slot 15 in the front end by means of a thumb-actuated button 16. The blade 14 is of conventional construction. Various types of such blades are available and any suitable blade can be used. Blade 14 has been illustrated as a trapezoidal blade with a stright bottom cutting edge, however, it will be understood that the particular type of blade used is not critical to practice of the invention.

In the preferred embodiment, the rear end of handle 14 is bent downwardly at about 15 to 25 degrees, and preferably 19 degrees, from the front end as shown in U.S. Pat. 4,038,719, the entire disclosure of which is incorporated

herein by reference, for ergonomic reasons. However, the handle could be straight or even bent at a different angle, if desired.

The handle 12 is preferably formed of die cast zinc for durability, although any suitable material could be used.

Referring now to Figs. 1-4, the handle 12 is of split construction comprising two mating half sections 12a and 12b connected together by a hinge 16. This comprises an important feature of the present invention because it permits the knife 10 to be opened without the handle 12 falling apart, which can easily occur with some of the utility knives of the prior art. This facilitates alignment during closing, and also helps avoid misplacement and possible loss of part of the handle 12, which in turn allows the blade 14 to be changed more quickly and conveniently.

In the preferred embodiment the hinge 16 is located at the rear end of handle 12, although it could be located elsewhere such as along the bottom side, if desired. Also, while any suitable construction can be utilized, the hinge 16 preferably consists of a roll pin 18 inserted from the bottom through aligned holes in overlapping portions of the handle sections 12a and 12b as shown. See Fig. 4. A

longitudinal fingernail notch 19 is preferably provided in the underside of handle 12 to facilitate opening.

The handle 12 is selectively secured together by a releasable latch or fastener 20 for ease of opening. Any suitable fastener can be used. For example, a screw extending through a hole in one handle section for threaded receipt in an internally threaded boss in the other handle section, could be used. A captured screw could also be used for fastener 20 so that it remains with one of the handle sections when knife 10 is open.

In the preferred embodiment, the fastener 20 comprises a spring-loaded latch assembly like that shown in U.S. Pat. 5,022,156 which is assigned to Better Tools, Inc. the assignee hereof, and the entire disclosure of which is incorporated herein by reference.

The fastener 20 includes a shaft 22 that extends through a hole 24 in the handle section 12b. A cap 26 is provided on the outside end of the shaft 22, while a cross member 28 is provided on the inside end of the shaft. A snap ring 30 is provided in a circumferential groove between the ends of shaft 22 on the inside of the handle section 12b, while a spring 32 is provided between the other side of

the handle section and cap 26. The shaft 22 is thus retained on the handle section 12b, but is normally biased outwardly by spring 32. A slotted hole 34 is provided in the opposite handle section 12a, as best seen in Fig. 2, in alignment with hole 24 for receiving the T-shaped inner end of shaft 22.

The shaft 22 can thus be pushed inwardly by cap 32 so that the cross member 28 passes through hole 34, after which the shaft can be turned to seat the cross member 28 in a counterbore 36 on the outside of handle section 12a in order to latch handle 12 in a closed position. Turning the shaft 22 the other direction releases the cross member 28 so that it can be pulled back through the slotted hole 34 by spring 32 in order to urge the shaft outwardly to unlatch the handle 12 for blade replacement, etc.

Fig. 6 shows the fastener 20 in a latched position, while Fig. 7 shows it in an unlatched position, both with handle 12 closed.

Figs. 6 and 7 also show some refinements to fastener 20 over the latch assembly shown in U.S. Pat. 5,022,156. The outside end of hole 24 is preferably counterbored as shown so that cap 26 is recessed and substantially flush in the

latched position. A transverse ridge 38 is preferably provided on the top of cap 26. One end of the ridge 38 is curved and smooth while the other end extends beyond the periphery of cap 26 for cooperation with a fixed bump 40 on the outside of handle section 12b. This facilitates thumb manipulation so that knife 10 can be unlatched with one hand, while minimizing snagging and possible inadvertent unlatching.

The outside end of slotted hole 34 is also preferably counterbored, with a pair of ridges 42 being provided therein to act as stops for the ends of cross member 28 in the latched position. Adjoining surfaces of the cross member 28 and slotted hole 34 are preferably V-shaped, as best seen in Fig. 7, for positive retention of the shaft 22 in the latched position. Also, the underside of the end of the ridge 38 is preferably angled as shown for cooperation with the bump 40, resulting in a camming effect when shaft 22 is turned to the latched position, as best seen in Fig. 6.

Referring to Figs. 2, 3 and 5, further internal constructional details of handle 12 can be seen. The blade 14 is mounted on a blade carrier 44 that is guided and supported on a pair of ribs 46 on the inside of section 12a

for movment between extended and retracted positions. In accordance with the preferred construction the blade carrier 44 is also retained by a rivet 47 extending through a longitudinal slot 48 therein. This comprises an important feature of the present invention because it prevents the blade carrier 44 from falling out when knife 10 is opened.

The blade carrier 44 includes an integral longitudinal spring arm 50 with a lateral tab 52 at the end. The thumb button 16 is connected to arm 50 and extends through a longitudinal slot 54 in the top of handle 12 for accomodating movement thereof. Actuation of the the thumb button 16 flexes the spring arm 50 so that tab 52 can be selectively positioned into one of the detents or notches 56 in handle section 12a to extend or retract the blade 14 and secure it in position as desired.

In reference to Figs. 5 and 8-10, the blade carrier 44 is of generally channel-like configuration with opposing top and bottom flanges 58 and 60 and a rear locating tab 62 to facilitate proper receipt and positioning of the blade 14 on the carrier. The middle portion of carrier 44 containing slot 48 is recessed as shown to ride between ribs 46.

In the preferred embodiment the blade carrier 44 further includes a T-shaped lug 64 within a gap in the top flange 58 for cooperation with a notch in the top edge of blade 14, which must be inserted before the bottom edge for proper seating. Further support is provided by ribs 65 on the inside of handle section 12b. This comprises an important feature of the present invention because it resists twisting and facilitates positive retention of blade 14 on the carrier 44.

A pair of longitudinal raised extensions 66 and 68, as best seen in Fig. 2, are preferably provided in the handle section 12a for further guiding and supporting the blade carrier 44 toward and away from the from opening 15. The extensions 66 and 68 are adapted for receipt in opposing notches 70 and 72, respectively, in the handle section 12b, as best seen in Fig. 3, to act as stops. This also comprises an important feature of the present invention because the blade 14 and/or blade carrier 44 cannot pass between the handle sections 12a and 12b.

A rear compartment 74 is provided within handle 12 for storing extra replacement blades 14, which are positively retained therein by a magnet 76 so that they do not inadvertently fall out when the handle is opened. A

longitudinal extension 78 is also preferably provided so that the blades 14 cannot come out between the handle sections 12a and 12b or interfere with closing of the handle 12.

Referring now to Figs. 11-13, there is shown a utility knife 80 incorporating a second embodiment of the invention. The knife 80 includes numerous component parts that are substantially identical in construction and function to those of knife 10 of the first embodiment. The same reference numerals have been used to identify such component parts in knife 80, but with prime (') notations for differentiation.

The primary distinction between the embodiments comprises the fact that knife 80 is of the fixed blade type. The handle 12' is similar except that the blade 14' rests directly on ribs 46' located by a fixed lug 82. The blade 14' is preferably positively retained by a magnet 84 against inadvertently falling out when handle 12' is opened. Three ribs 65' are provided on handle section 12b'. Otherwise knife 80 is similar to knife 10.

From the foregoing, it will thus be understood that the present invention comprises a new and unique utility knife

having several advantages over the prior art. One significant advantage is that the handle sections are hinged together so that they cannot come apart. Another significant advantage is that various internal components are positively retained and secured against inadvertently falling out when the knife is opened. The knife herein can be unlatched and opened with one hand. Attention has been paid to making the blade resistant to dislocation under twisting. Other advantages will be evident to those skilled in the art.

Although particular embodiments of the invention have been illustrated in the accompanying Drawing and described in the foregoing Detailed Description, it will be understood that the invention is not limited only to the embodiments disclosed, but is intended to embrace any equivalents, modifications and/or rearrangements of elements falling within the scope of the invention as defined by the following Claims.

Claims

What is claimed is:

1. A utility knife, which comprises:

a handle having opposite front and rear ends, said handle being of longitudinally split construction having opposite mating portions;

a hinge interconnecting the portions of said handle for movement between open and closed postions;

means for mounting a blade within said handle extending out of a slot in the front end of said handle; and

latch means for releasably securing the portions of said handle together in the closed position.

2. The utility knife of claim 1, wherein said handle is formed of metal.

3. The utility knife according to claim 2, wherein said handle is formed of die cast zinc.

4. The utility knife of claim 1, wherein the rear end of said handle is bent downwardly at a predtermined angle from the front end.

5. The utility knife of claim 1, wherein said hinge comprises overlapping adjacent portions of said handle interconnected by a roll pin extending through aligned openings therein.

6. The utility knife according to claim 5, wherein said hinge is located at the rear end of said handle.

7. The utility knife of claim 1, wherein said blade mounting means comprises:

a plurality of longitudinal ribs extending rearwardly from the slot in the front end of said handle on opposite inside surfaces of said handle portions;

a blade carrier;

means for mounting said blade carrier on one of said handle portions for longitudinal sliding movement toward and away from the slot; and

means for selectively securing said blade carrier in a plurality of longitudinal positions.

8. The utility knife according to claim 7, wherein said means for mounting said blade carrier includes a fastener extending through a longitudinal slot.

9. The utility knife according to claim 7, wherein the slot is located in a longitudinal recess in said blade carrier.

10. The utility knife according to claim 7, wherein said blade carrier is of generally channel-like configuration including:

a pair of spaced apart, longitudinal top and bottom flanges adapted for receiving the top and bottom edges of a blade therebetween;

a rear locating tab; and

a T-shaped lug in a gap in the upper flange adapted for cooperating with a notch in the blade for purposes of retention.

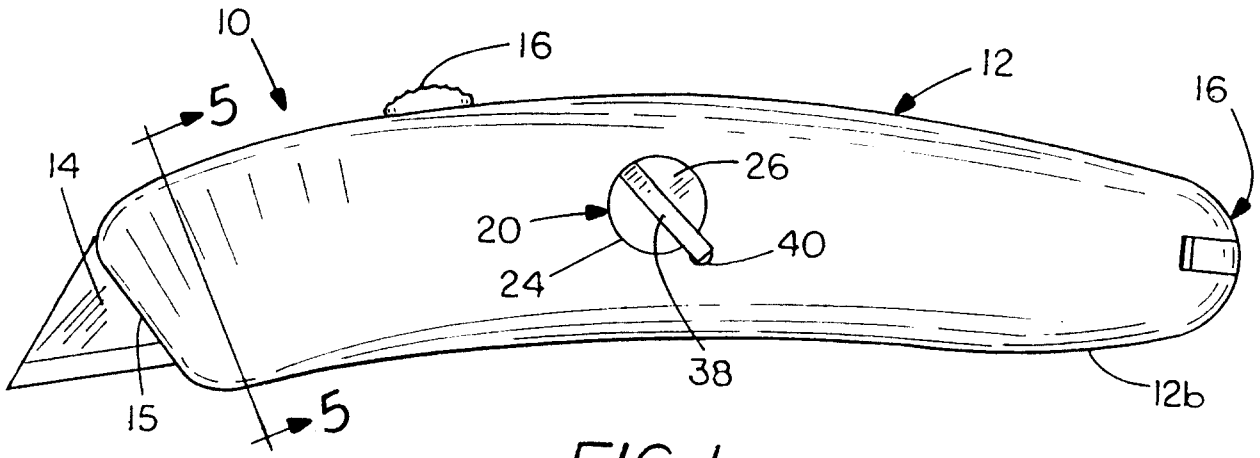


FIG. 1

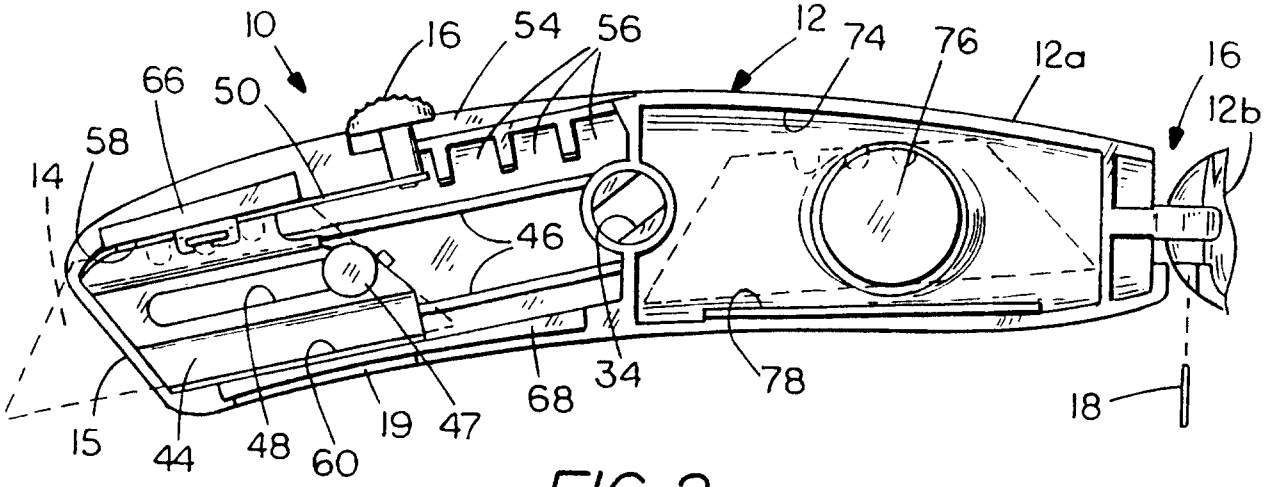


FIG. 2

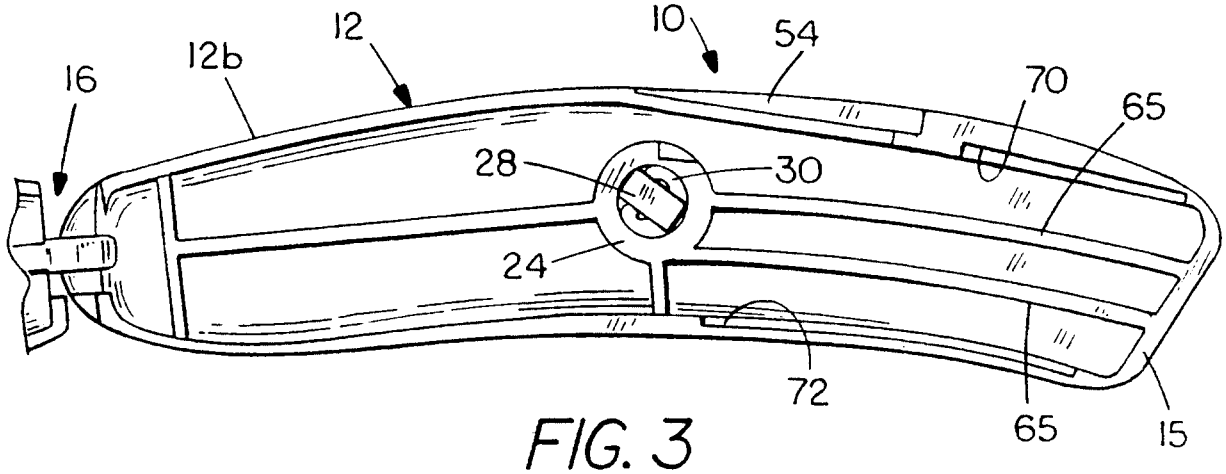


FIG. 3

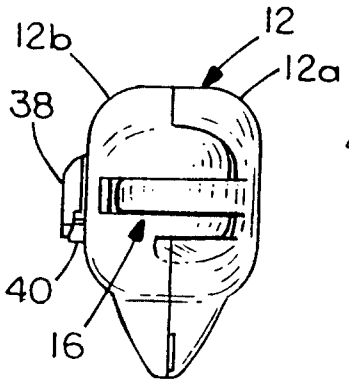


FIG. 4

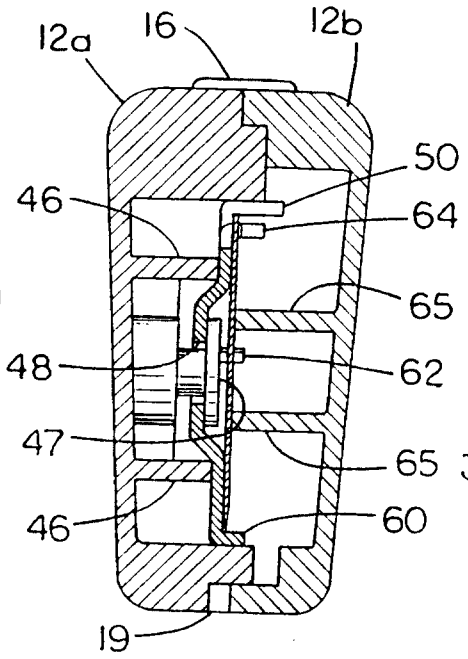


FIG. 5

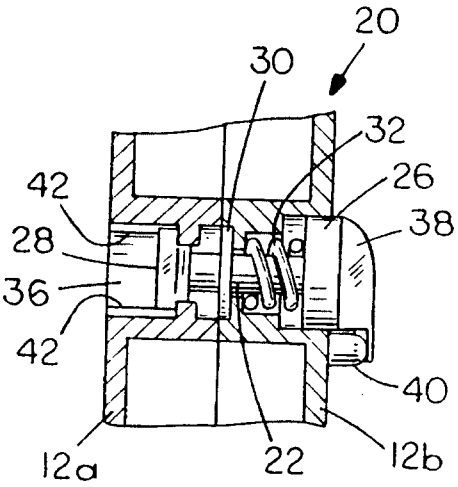


FIG. 6

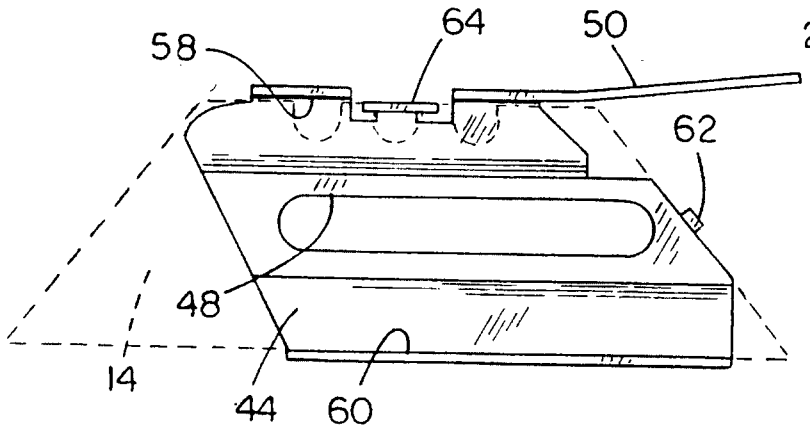


FIG. 8

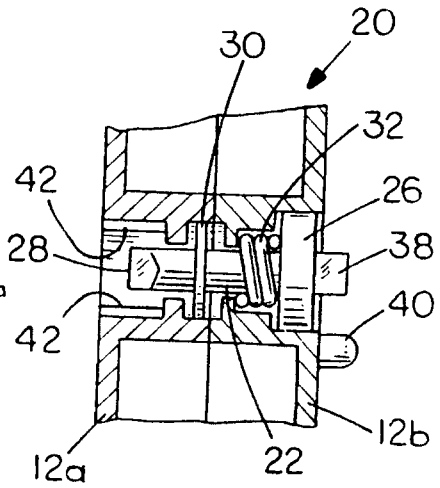


FIG. 7

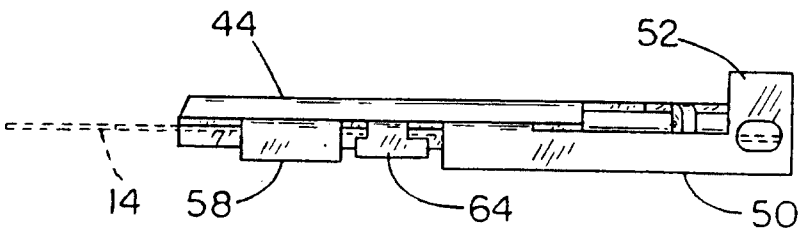


FIG. 9

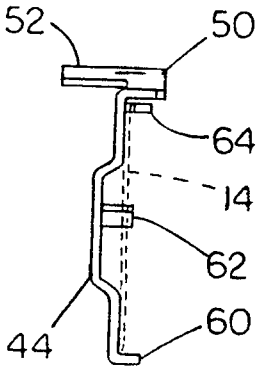


FIG. 10

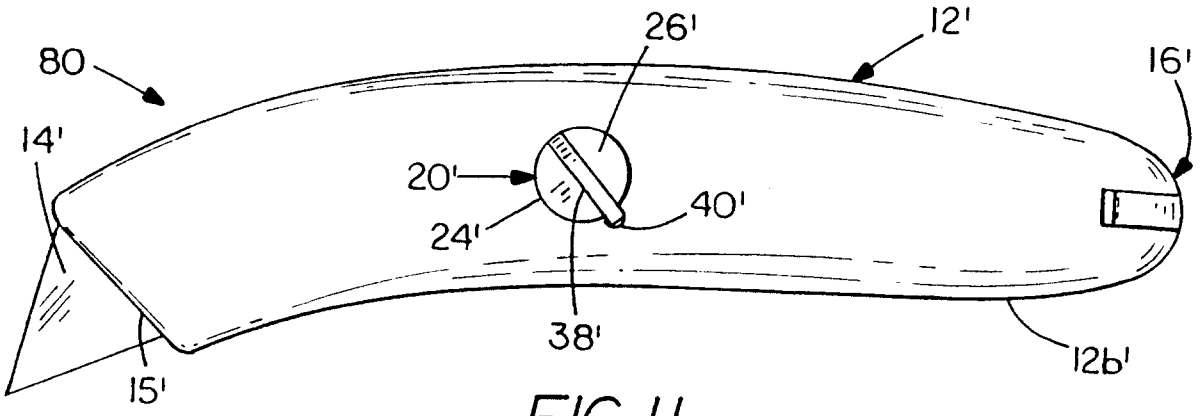


FIG. 11

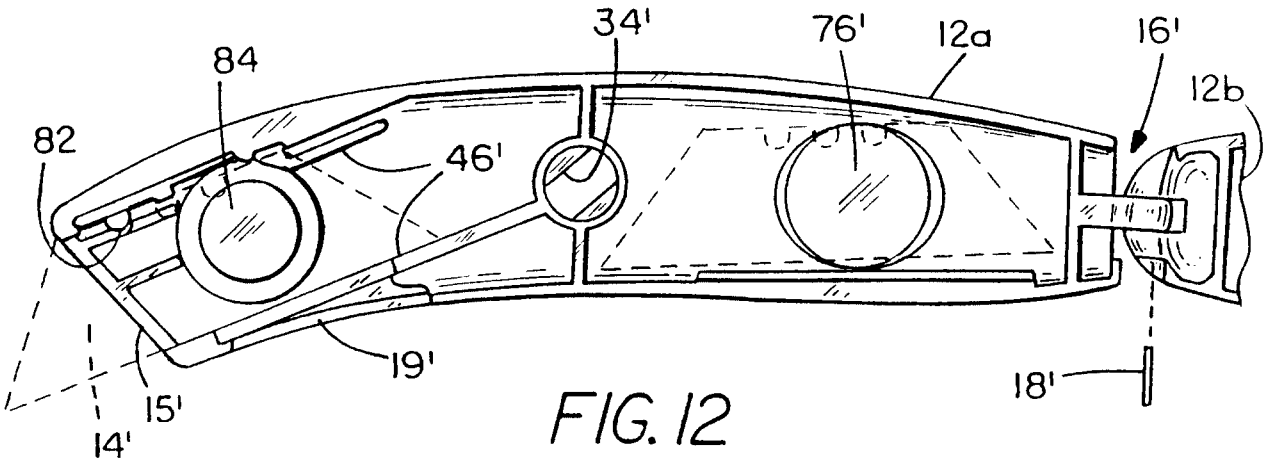


FIG. 12

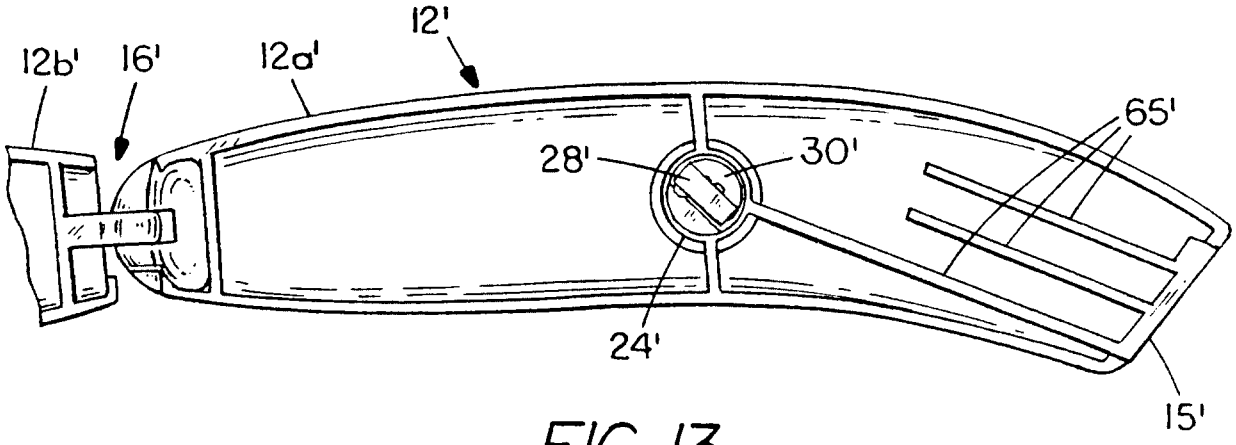
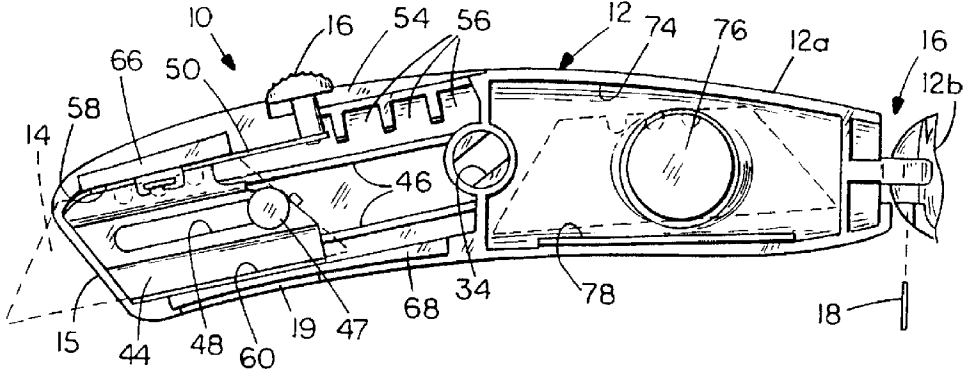


FIG. 13


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16
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56
12
74
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12a
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12b
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14
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