July 7, 1970 R. A. BENNETT 3,518,758

UTILITY KNIFE WITH MOVABLE AND ROTATABLE BLADE

Filed Oct. 24, 1967 2 Sheets-Sheet 1

FIG. 1

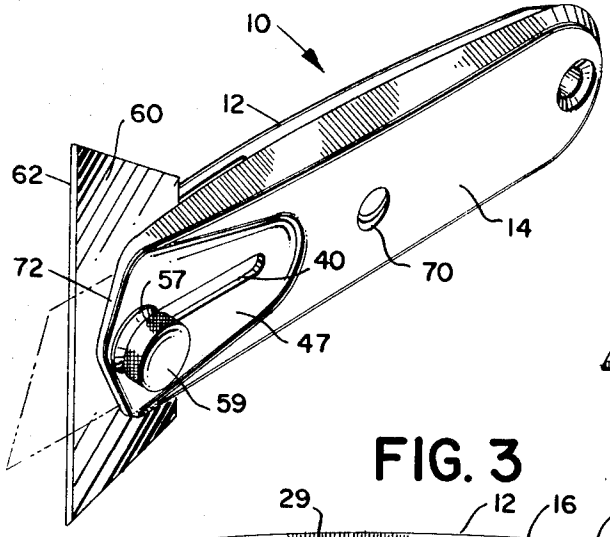

FIG. 2

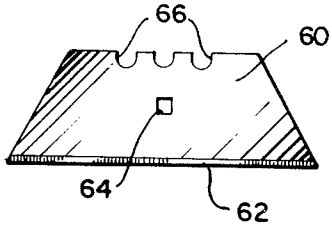

FIG. 3

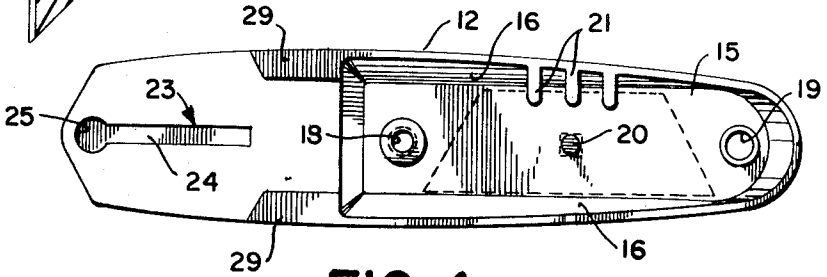

FIG. 4

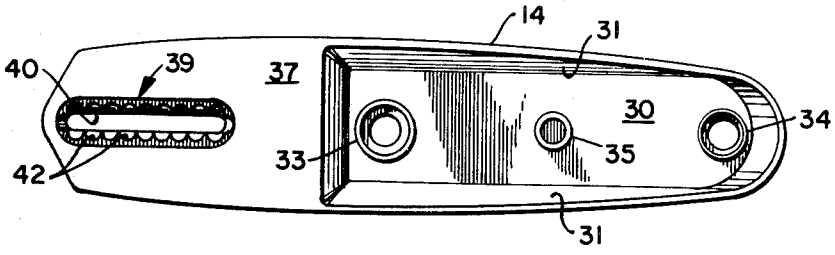

FIG. 5

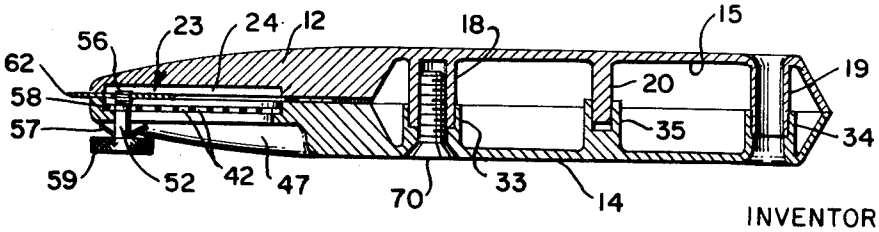

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FIG. 6

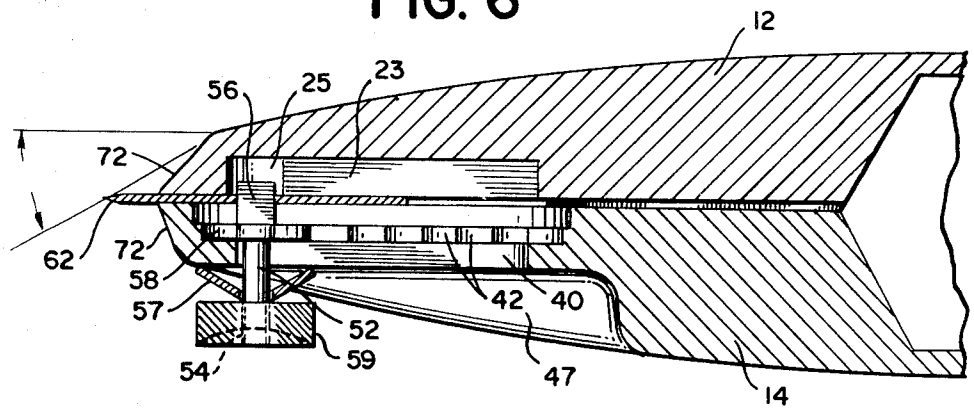

FIG. 7

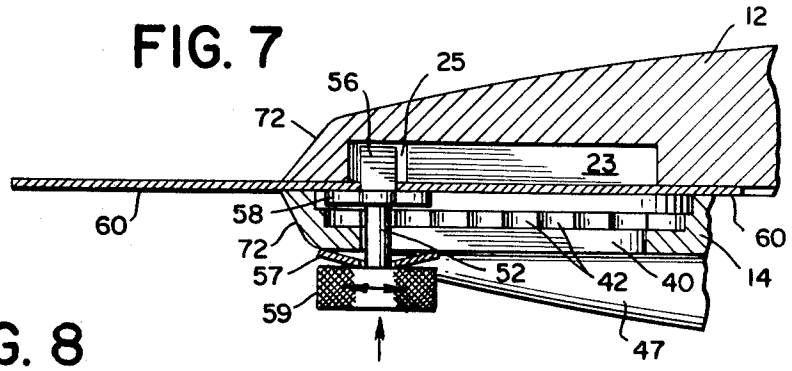

FIG. 8

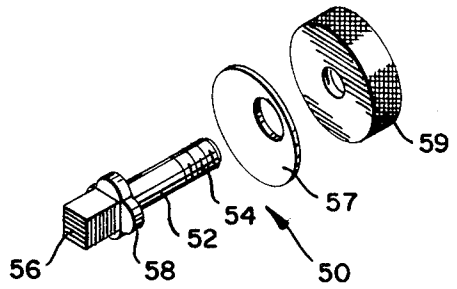

FIG. 9

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UTILITY KNIFE WITH MOVABLE AND ROTATABLE BLADE

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U.S. Cl. 30—154 8 Claims

ABSTRACT OF THE DISCLOSURE

A utility knife having a blade which is movable from a position entirely within the knife handle to one with an exposed cutting edge in a series of steps and in which a locking arrangement is provided which permits the blade to be turned to a scraping position and also to expose another portion of the blade for cutting without disassembling the knife handle.

Utility knives are of great use to home owners and others who have need for a general purpose knife which has a variable length cutting blade. Such knives also find added usefulness if they can be used for other purposes such as scraping windows.

In the past, knives have been sold in which a razor blade is located within a handle and some arrangement is provided to move the blade in fixed increments or continuously along the length of the handle to extend more or less of the blade length for cutting purposes. In some of these prior art knives it is possible to use the same blade for a scraper and also to turn the blade around, so that another portion of it can be used for cutting purposes, thereby insuring that the entire cutting edge of a single razor blade is used rather than just half of the edge. While this has been possible with certain prior art knives, it has generally been necessary to disassemble the knife both to adjust it for use as a scraper and also to reverse the blade in the knife handle, so that another portion thereof can be used for cutting purposes.

The present invention provides a utility knife of simplified construction in which a blade can be easily extended or retracted in incremental steps. In addition, the knife of the present invention has the capability of readily turning the knife blade by a fixed angle, for example, 90°, from its cutting position to a scraping position without disassembling the knife and also to reverse the blade so that another portion of it can be used for cutting purposes.

In accordance with the present invention, a novel utility knife is provided having a locking member which rides in a detent track. The locking member is biased outwardly by a spring to normally be in a locking position with the detent and the blade is moved longitudinally by depressing the spring and sliding the locking member along the detent track. The locking arrangement is made so that the locking member can be depressed to clear the detent so that the blade can be turned to a desired position.

Accordingly, it is an object of the present invention to provide a utility knife in which the blade can be moved in incremental steps to expose a greater or lesser amount of cutting edge and also turned without disassembling the knife.

A further object is to provide a utility knife with a novel locking arrangement.

An additional object is to provide a utility knife in which the locking member is spring-biased normally into a locking position.

A further object is to provide a utility knife which can be used as a scraper and the blade turned to expose a new cutting edge without disassembling the knife.

Other objects and advantages of the present invention

will become more apparent upon reference to the following specification and annexed drawings, in which:

FIG. 1 is a perspective view of the knife showing the blade extended in a scraping position;

FIG. 2 is an elevational view of a knife blade;

FIG. 3 is an elevational view showing the inside of one half of the handle;

FIG. 4 is a side elevational view showing the inside of the other half of the handle;

FIG. 5 is a top view of the assembled knife of FIG. 1 taken in section approximately through the center;

FIG. 6 is an enlarged top view showing a fragment of the front end of the knife in cross-section with the blade extended in scraping position;

FIG. 7 is a fragmentary view of the front portion of the knife taken in section showing the blade in an extended cutting position;

FIG. 8 is an end view of the locking bolt; and

FIG. 9 is an exploded perspective view of the locking member formed by the locking bolt, spring washer and knob.

Referring to FIGS. 1–5, the knife **10** of the present invention comprises an elongated handle having two sections **12** and **14**. The handle sections are preferably cast of metal or molded of plastic. For greater strength, it has been found that metal is more desirable. As shown best in FIGS. 3 and 5, handle section **12** has a depressed interior compartment **15** with a floor of generally rectangular shape except for the curved rear end of the handle. Walls **16** taper downwardly from the inner face of the knife section **12** to the floor of compartment **15**.

A threaded, cylindrical stud **18** projects upwardly from the floor of compartment **15** near the center of the handle section and an unthreaded stud **19** projects upwardly from the compartment floor near the curved end of the handle. A post **20** which can be round or polygonal, also projects upwardly from the compartment floor near its center. As shown most clearly in FIG. 3, a number of ribs **21** extend inwardly from the edge of the wall **16** at one side along the long portion of the handle section into the compartment area **15**. The use of these ribs **21** for holding blades is described in detail below.

A keyhole shaped slot **23** with an elongated portion **24** and a circular end portion **25** near the front end of the knife is formed in the front of the handle section **12**. As seen in FIGS. 5–7, the keyhole slot **23** extends only partially through the handle section **12** and the hole **25** is spaced back from the end of the knife. A pair of raised guides **29** are also formed on the inner face of the handle section **12** adjacent the compartment **15**. The guides **29** extend toward the front end of the knife for a distance sufficient to permit the blade to clear them when the blade is fully extended.

Referring to FIG. 4, the other handle section **14** has an overall shape complementary to the section **12** and has a complementary depressed compartment **30** formed therein tapering down from walls **31**. The compartment **30** can be eliminated, if desired. Cap members **33**, **34** and **35** extend upwardly from the floor of compartment **30** to fit over the corresponding studs **18** and **19** and the post **20** of the handle section **12**.

As shown in FIGS. 4–7, the front portion of handle section **14** has a smooth end area **37** in which is formed a depressed detent track **39** having an elongated slot **40** which lies outwardly of a plurality of semi-circular detents **42**. It should be noted that the members of a pair of semi-circular detents **42** oppose each other along the length of the track **39** and therein is an opposing semi-circular detent at each end of the track. Slot **40** extends completely through the wall of the handle section **14** into a generally triangular shaped depressed area **47** on the outer face of handle section **14** which is provided to ac-

commodate the thumb of a user of the knife (see FIG. 1).

As shown in FIGS. 8 and 9, a locking member **50** is provided which is formed by a bolt **52** having a threaded end **54** and a head **56** of generally square shape at the other end. A set of locking tabs **58** are located on the bolt at the inner end of the head **56**. The locking tabs **58** are formed in a generally cloverleaf shape here shown as having four tabs spaced 90° apart. Each tab matches and is capable of riding into one of the detents **42** of the handle section **14**.

The locking member is completed by a conical spring washer **57**, commonly called a Belleville spring, which fits over the unthreaded portion of bolt **52**. A knob **59**, which may be knurled if desired, has threads thereon which mate with the threads **54**. As described below, the knob **59** is staked to the bolt **52** during assembly of the knife.

FIG. 2 shows one type of blade **60** which can be used with the present invention. As shown, the blade **60** is of generally trapezoidal shape and has a cutting edge **62** at the base of the trapezoid. A central aperture **64** is provided which is of the same shape as and slightly larger than the head **56** of the locking member **50**. Similarly, three cutouts **66** are located on the upper side of the blade to mate with the ribs **21** in handle section **12** to hold the blade in compartment **15**. It should be noted that the locking member head **56** and the blade aperture **64** can be of any complementary, mating shape in which the head is not free to rotate within the aperture. For example, the head and aperture can be triangular.

The knife is assembled in the following manner. First, the bolt **52** of the locking member is inserted into the slot **40** of the detent track **39** of handle section **14** by passing the threaded end **54** of the bolt from the inside of handle section **14** through the slot. The spring washer **57** is then placed over the unthreaded portion of the bolt and the knurled knob **59** is fastened onto threads **54** and staked thereto to prevent it from being removed. As should be apparent, the bolt **52** is held within the handle section **14** since the tabs **58** are larger than the width of slot **40**.

After the locking member **50** is assembled, a blade **60** is placed in the front end of the handle section **14** with the head **56** of the locking member **50** passing through the correspondingly shaped aperture **64** of the blade. The two halves **12** and **14** of the handle are then put together by placing the caps **33**, **34** and **35** of section **14** over the corresponding studs **18**, **19** and post **20** of section **12**. The blade **60** is aligned between the two raised guides **29**. The two halves are then fastened together by a headed screw **70** which passes through the cap **33** and screws into the internally threaded stud **18**. It should be noted that the locking member head **56** extends into the keyhole slot **23** of handle section **12**.

As seen best by referring to FIGS. 1, 6 and 7, the operation of the knife is as follows. The tabs **58** of the locking member ride in the detents of the detent **42** track **39** and are of sufficient size to mate therewith. The head **56** is only slightly smaller than the aperture of the blade to provide a fairly tight fit so that the blade is moved as the locking member is moved. When the knob **59** of the locking member **50** is not depressed by the thumb of the operator, the spring washer **57** applies pressure outwardly between the outer face of handle section **14** and the knob **59**. This moves the locking member outwardly thereby locking a pair of opposing tabs **58** in a pair of the detents **42**. This prevents the blade from being moved longitudinally (into or out) of the handle.

When it is desired to extend or retract the blade **60** in a cutting position, as shown by the dotted line position of FIG. 1, it is only necessary to depress the knob **59**. This moves the tabs **58** of the locking member **50** toward the slot **23** of handle section **12**, clearing the tabs **58** from the detents **42**. As shown in FIG. 7, the head **56** of the locking member extends further into the slot **23** when the knob **59** is depressed. With the knob **59** depressed and the tabs **58** cleared from the detents the blade **60** can be moved longitudinally out of handle for a desired distance limited by the lengths of the slots **24** and **40** merely by moving the knob. When the desired length of the blade has been extended or retracted, it is necessary only to release the knob **59**. This, as shown in FIG. 6, causes the spring washer **57** to push back the locking member **50** causing the tabs **58** to lock in the detents **42**. The blade **60** is preferably properly sized so that the blade can be fully retracted into the housing with the locking member to the extreme right. The detent at the extreme right end of track **39** (FIG. 4) permits the locking member to be moved fully to the right while the detent at the extreme left of the track locks the blade fully extended, as shown in FIGS. 6 and 7. In the fully extended cutting position of FIG. 7, only about one half of the blade edge is exposed.

One important advantage of the present invention is that it permits the blade to be extended to a scraping position, such as shown in FIG. 6 or to be completely reversed so that the other half of the blade can be used as a cutting edge without taking the handle apart. As shown in FIG. 3, the circular end **25** of the slot **23** is large enough to permit rotation of the square head **56** of the locking member. This is the only place where the head **56** can be rotated since the slot **24** is of a size to permit a clearance fit of the head for sliding longitudinal movement but not permit its turning therein. When the blade **60** is fully extended (FIG. 7) at which time the head **56** is in the circular hole **25**, depressing knob **59** clears the tabs **58** from the detents and the blade **60** can now be turned by rotating knob **59**. Since there are four tabs **58** on the locking member, rotation of the blade **60** is in steps of 90 degrees. When the blade is turned 90 degrees from the dotted line position, shown in FIG. 1, it will assume the scraping position shown in FIGS. 1 and 6. While in the scraping position shown in FIG. 1, the knob **59** also can be depressed to adjust the protrusion of the blade from the end of the handle. The locking member **50** holds the blade in the same manner previously described as when the blade is in the cutting position.

As shown in FIG. 6, the nose of the knife is tapered at portions **72** on both handle sections **12** and **14**, so that with the blade in the scraper position and fully extended an angle of about 30 degrees is obtained, as shown. This has been found to be particularly advantageous in scraping paint from windows.

To fully utilize the entire blade for cutting, since normally only about one half of the blade is exposed when fully extended, it is only necessary to move the locking member **50** fully forward to the position shown in FIGS. 5–7, depress knob **59** and then rotate the blade 180 degrees. This brings the half of the blade within the knife to an exposed cutting position and places the previously exposed half of the blade within the handle. Thus, the entire cutting edge of the blade can be used without having to disassemble the handle, as is common with most knives currently being sold.

To change blades, it is necessary that only the screw **70** be removed, so that the handle sections **12** and **14** can be taken apart. The blade held by the locking member **50** is removed and a new blade is placed over the square head of the locking member. The two halves of the knife are then reassembled and the screw **70** inserted and tightened.

As shown in FIG. 3, a number of extra blades **60** may be held in the compartment **15**. These blades fit with their apertures **64** over the post **20** with the ribs **21** fitting into the circular grooves **66** of the blade. Thus, the blades are held in the compartment **15** securely and will not rattle or turn around when the second half **14** of the compartment is placed thereover, as shown in FIG. 5. The cap **35** of handle section **14** holds the blades securely.

While a preferred embodiment of the invention has been described, it will be understood that it is illustrative

only, and the invention is to be limited solely by the appended claims.

What is claimed is:

1. A utility knife comprising a blade formed with a keyed aperture, a handle having two sections defining an interior passage along which said blade moves toward and away from the front of the handle, the front of the handle formed with an opening through which said blade can extend and be rotated, means for holding the two handle pieces together, one of said sections formed with a through elongated slot along a portion thereof, a locking member having a head portion complementary to the keyed aperture of the cutting blade to engage the cutting blade and form an actuating member to move and rotate the blade and an end which extends through said slot exterior to said one section, cooperating means including an extending member on said locking member and a plurality of detents into which said member fits formed adjacent the slot along a generally straight line for holding said locking member and said blade in one of a number of predetermined positions along the slot, said handle also formed with at least one other detent adjacent the end of said slot at the front of the handle at an angle to the line of the other detents into which said extending member can fit upon rotation of the locking member to hold said blade at at least one other angle than that defined by the first named detents, and means for normally operating said locking member to actuate said extending member to fit into a said detent to prevent movement of the locking member and blade relative to said handle.

2. A utility knife as set forth in claim 1 wherein said detents are formed in said one handle section adjacent said through slot.

3. A utility knife as set forth in claim 1 wherein said operating means comprises a spring washer which urges a said extending member into a detent.

4. A utility knife as in claim 1 wherein said other detent is at an angle of substantially not more than 90° with respect to the line defined by the first named detents, the tab of said locking means when in said other detent holding the blade with its edge at said angle.

5. A utility knife as in claim 1 wherein said other detent is facing in the opposite direction from the first named detents, said locking means rotating the blade by substantially 180° when in said handle opening to engage the extending member in said other detent and hold the blade in position.

6. A utility knife as in claim 1 wherein there are two lines of detents lying opposite each other and facing in generally opposite directions on each side of said elongated slot, and the one other detent is between said two lines of detents and is at an angle different from the detents of the two lines.

7. A utility knife as in claim 6 wherein said extending member of said cooperating means on said locking means has a three sided tab, two of said tabs fitting into respective detents of said two lines or detents and the third tab fitting into said other detent.

8. A utility knife as in claim 7 wherein said extending member has four tabs, any three of which can engage the detents upon rotation of the locking member.

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U.S. Cl. X.R.

30—321