

Description

This invention relates to knives of the kind having a blade which is movable between an extended or operative position and a retracted or inoperative position. It is usual for the blade to be contained within a handle of the knife when retracted, and the invention will be hereinafter described with particular reference to that form of knife.

Retractable blade knives of the foregoing kind are generally constructed so that a worn or damaged blade can be removed and replaced by a new blade. Example constructions of that kind are disclosed by U.S. patents 3,577,637, 3,593,417 and 4,242,795. It is not convenient to sharpen the blade in knives of the foregoing kind and as a result blade replacement may occur or be required at relatively short intervals of time.

It has been proposed in the past to provide a retractable blade knife with a self-sharpening facility, and U.S. patent 1,890,506 (Frank) discloses that particular construction. The Frank knife is not known to have been manufactured in commercial quantities, and is distinguished from the other retractable blade knives referred to above in that the blade is not readily replaced. It has the further disadvantage in that retraction of the blade extends rather than reduces the overall size of the knife. The Frank knife is also not satisfactory because the self-sharpening facility does not sharpen the entire length of the blade cutting edge, and in particular does not and cannot sharpen the very tip of the blade which is often the most used portion of the blade.

Another common problem with knives of the foregoing kind is that the blade is not firmly restrained in the extended position so that pressure on the blade during use can cause unintentional retraction of the blade.

It is an object of the present invention to provide a knife of the foregoing kind which has an effective self-sharpening facility. It is another object to provide such a knife having means to prevent inadvertent extension of the blade. It is a further object to provide such a knife with means whereby the blade is positively retained in the extended position.

According to this invention, there is provided a retractable blade knife including, a hollow handle, a blade opening at a front end of said handle, a blade carrier mounted within said handle for movement relative thereto, connecting means whereby a blade can be connected to and removed from said carrier, said carrier being movable between a rest position at which a blade connected to said carrier is contained within said handle and a forward position at which the said blade is projected through said opening beyond said handle front end, actuator means operable to cause said carrier movement, a blade sharpener located within said handle adjacent said opening and being operable to engage the cutting edge of the said blade so as to sharpen that edge during movement of said blade through said opening, and sharpener release means which is selectively operable to render said sharpener inoperable.

The actuator means may be connected to said

carrier and operable to cause movement thereof. Preferably, a blade sharpener is located within said handle adjacent said opening and mounted for movement relative to said handle. There may be biasing means urging said sharpener towards a stop position at which the sharpener prevents movement of said blade forwardly through said opening and release means operable to move said sharpener away from said stop position and into a release position at which a said blade is able to be moved forwardly through said opening.

The sharpener preferably includes sharpening means which is engageable with said cutting edge and which is located forwardly of the front end of said blade when said carrier is in said rest position. The blade may be removably connected to said carrier.

Stop means can be mounted on said handle for movement between a stop position at which it is operative to prevent movement of a said blade forwardly through said opening and a release position at which it is not so operative, and also release means which is operable to move said stop means from said stop position to said release position.

Releasable locking means may be provided which is operable to prevent movement of said carrier out of said forward position.

The blade sharpener is arranged so that when it engages the cutting edge of a blade it automatically sharpens that blade as a consequence of movement of the blade into or out of the knife handle. In a preferred embodiment hereinafter described, the sharpening operation is most effective during withdrawal of the blade into the handle, and means is provided to enable that sharpener to be held inoperative during at least part of the movement of the blade into its extended operative position.

An embodiment of the invention is described in detail in the following passages of the specification which refer to the accompany drawings. The drawings, however, are merely illustrative of how the invention might be put into effect, so that the specific form and arrangement of the various features as shown is not to be understood as limiting on the invention.

In the drawings:

Figure 1 is a side elevational view of one form of retractable blade knife incorporating an embodiment of the invention,

Figure 2 is a top plan view of the knife shown in Figure 1,

Figure 3 is a partially sectioned and exploded view of the rear end portion of the knife shown in Figure 1,

Figure 4 is an end view of the removable end portion shown in Figure 3,

Figure 5 is a cross-sectional view taken along line V-V of Figure 1,

Figure 6 is a longitudinal sectional view of the knife shown in Figures 1 and 2, but with parts omitted for convenience of illustration,

Figure 7 is sectional view taken along line VII-VII of Figure 5,

Figure 8 is a view similar to Figure 7 but showing the blade fully retracted,

Figure 9 is a view similar to Figure 8 but with parts omitted for convenience of illustration,

Figure 10 is a view similar to Figure 9 but showing the stop means rendered inoperative,

Figure 11 is a view similar to Figure 10 and showing the blade carrier in a forward position,

Figure 12 is a part sectional view showing the manner of actuation of the blade carrier of the knife of Figure 1,

Figure 13 is a view similar to Figure 12 but showing the blade carrier moved to its forwardmost position,

Figure 14 is a view similar to Figure 13 and showing the blade actuator in its stored position,

Figure 15 is a cross-sectional view taken along line XV-XV of Figure 6.

Figure 16 is a view taken along line XVI-XVI of Figure 14.

According to the example form shown in the drawings, the knife includes an elongate handle 1 having a passage 2 (Figures 5 and 6) extending lengthwise therein. That passage 2 is defined between an upper wall 3, a lower wall 4, and two side walls 5 and 6, and extends from a rear end portion 7 of the handle 1 to a front end wall 8. An opening 9 (Figure 6) is provided through the front end wall 8 to permit movement of a blade 10 into and out of the handle passage 2. Preferably, that opening 9 is in the form of a narrow slot extending between upper and lower sides of the handle 1 and which is dimensioned to allow passage of the knife blade 10 with little clearance. That is, it is preferred that the opening 9 is dimensioned so as to at least minimise lateral movement of the blade 10 relative to the handle 1, and preferably also provide a support which is engageable by the upper edge 11 of the blade 10 when the knife is in use.

The rear end portion 7 of the handle 1 is removable in the construction shown to enable access to the interior of the handle 1. Removal of that end portion 7 may be employed to enable exchange of the knife blade 10 if it becomes worn or damaged. Also, the handle 1 may include a spare blade storage compartment 12 (Figure 5) which is accessible as a consequence of removing the end portion 7. The compartment 12 may be adapted to contain a single spare blade (not shown), or a plurality of such blades.

In the arrangement shown, the end portion 7 is slidably engaged with the main body 13 of the handle 1 so as to be relatively movable in a direction transverse to the longitudinal axis of the handle 1. Keying ribs 14 (Figures 1 and 3) provided on the end portion 7 slidably engage within complementary slots formed in the handle main body 13 so as to hold the end portion 7 against endwise removal from the main body 13. Snap engaging means comprising a detent 15 (Figures 3 and 4) may be provided on the end portion 7 for cooperation with the main body 13 so as to resist inadvertent dislodgement of the end portion 7 from the main body 13. As best seen in Figure 4, the detent 15 is at the end of a flexible arm 16 formed integral with the end portion 7.

The blade 10 may be of any suitable form, but is generally of plate-like form having a substantially

straight cutting edge 17. It is preferred that a front edge 18 and the upper edge 11 of the blade 10 are also substantially straight and that the front edge slopes upwardly and rearwardly from a tip 19 at its junction with the cutting edge 17. In such a case, it is also preferred that the front wall 8 of the knife handle 1 slopes downwardly and rearwardly as shown so as to expose a substantial part of the blade cutting edge 17 when the blade 10 is extended (Figure 1). It is also preferred that the blade 10 is double ended so as to be reversible.

A blade carrier 20 (Figure 16) is mounted within the knife handle passage 2 for sliding movement towards and away from the front wall 8. That carrier 20 can be of any suitable form such as to provide support for a blade 10, and any appropriate releasable connection can be provided between the blade 10 and the carrier 20 to ensure that the blade 10 moves with the carrier 20. In the construction shown, that connection includes a plurality of laterally projecting pins 21 on a side surface 22 of the carrier 20, each of which neatly engages within a respective hole 23 formed through a portion 24 of the blade 10 which overlies the carrier surface 22. Confinement of the blade 10 within the handle 1 may be such as to prevent the carrier pins 21 disengaging from the blade holes 23.

Exchange of a blade 10 may be effected by sliding the carrier 20 and connected blade 10 out of the handle 1 through the rear end thereof. Such removal is of course prevented while the rear end portion 7 of the handle 1 remains in place.

The carrier 20 is movable between two extreme positions. One is a rest position as shown in Figure 8, and in that position the blade 10 is fully contained within the handle 1. The other is a forward position as shown in Figure 7, and in that position the blade 10 has been projected through the opening 9 so as to extend beyond the handle front wall 8. That is, the blade 10 is positioned so as to be operative.

Movement of the carrier 20 may be effected through any suitable actuator means, but in the construction shown that actuator means comprises a lever 27 which is pivotally connected at an inner end 28 to the carrier 20 for relative movement between an operative position (Figures 12 and 13) and a stored position (Figure 14). Also, the lever 27 is preferably arranged to be accessible at the side wall 5 of the handle 1.

According to the arrangement shown, the lever 27 is pivotally connected to the carrier 20 so that it can be swung about a pivot 29 (Figure 12) having its axis extending between the upper and lower walls 3 and 4 of the handle 1. An elongate opening 30 is provided in the side wall 5 to accommodate the lever 27 when it is in the stored position. The length of the opening 30 is such as to accommodate the full length of the lever 27 without substantial clearance at either end. One end 31 of the opening 30 is formed by a surface 32 (Figure 3) of the handle end portion 7.

The pivoted inner end 28 of the lever 27 is adjacent the rear end portion 7 of the handle 1 when the lever 27 is in its stored position and the knife blade 10 is retracted (Figure 8). The outer or free end 33 of the lever 27 is located towards the front end of

the handle 1 under those circumstances, and the lever 27 is substantially contained within the opening 30. A raised finger engageable portion 48 of the lever 27 is accessible to permit the lever 27 to be pulled outwards about the pivot 29 to adopt the operative position as shown in Figure 13.

When it is desired to extend the blade 10, the lever 27 is pivoted laterally outwards from the handle 1 and is pushed forward so that the carrier 20 and connected blade 10 also move forward. The blade 10 is thereby projected through the front wall opening 9 of the handle 1 to adopt the extended position as shown in Figure 1. At that time the pivoted inner end 28 of the lever 27 is at the forwardmost end of the opening 30 in the handle side wall 5 and the lever 27 can be swung inwards to be again accommodated in that opening 30. The relative disposition of the lever ends 28 and 33, however, is now the reverse of that existing when the blade 10 is retracted.

Positive locking means is provided to prevent the blade 10 being inadvertently pushed back into the handle 1 from the extended position when the blade 10 is subjected to endwise pressure in use. In the construction shown, that locking means includes the lever 27 and a cooperative abutment surface formed by the end 31 of the handle opening 30. That is, when the lever 27 is accommodated within the opening 30 as shown in Figure 14, the outer end 33 of the lever 27 is arranged in opposed relationship to that abutment surface so as to positively resist rearward movement of the carrier 20. Pivotal movement of the lever 27 out of the opening 30 releases that locking arrangement by removing the lever end 33 from a position at which it can engage the abutment surface.

Stop means is provided to prevent inadvertent movement of the blade 10 into the extended position. That may include a movable stop member located within the handle 1 which is engageable with the blade 10 or a cooperable part of the carrier 20. That is, when the carrier 20 is at the rest position, that stop member is arranged to be engaged by the blade 10 or the carrier 20 such as to prevent forward movement of the carrier 20 beyond a particular position.

In the preferred construction shown, the stop means is formed by cooperable parts of a blade sharpener 34 and the carrier 20, but other arrangements are possible. The sharpener 34 is located within the handle 1 adjacent the front wall 8, and its function and construction will be further described below. The sharpener 34 includes a body member 35 and the stop means part of the sharpener 34 is formed by a lateral projection 36 provided on a rear end portion of an arm 37 which is connected to and extends rearwardly from the body member 35. The cooperable part of the carrier 20 is formed by the front end portion 25 of a laterally projecting lip 26 formed along the upper side of the carrier 20.

When the carrier 20 is at the rest position as shown in Figure 8, the carrier stop part 25 is located rearwardly of the sharpener stop part 36. Forward movement of the carrier 20 results in the stop part 25 engaging the stop part 36, and further forward movement is thereby prevented. At that time,

the blade 10 has not been projected through the opening 9.

Release means is provided whereby the stop means can be selectively rendered inoperative. In the construction shown, that release means is connected to the sharpener 34 so as to be operable to move the stop part 36 out of the path of the carrier stop part 25 and thereby permit extension of the blade 10. That release means includes a button 38 which is accessible at the upper side of the handle 1 and which is spring biased into an upper stop operative position as shown in Figure 9. Depression of the button 38 against the influence of the biasing spring 39 is effective to move the stop part 36 into its inoperative position as shown by Figure 10.

The button biasing spring 39 is preferably formed by a resilient arm as shown in Figure 6 which extends lengthwise of the handle 1, and has one end 40 fixed to the handle 1 and its opposite end 41 attached to the sharpener 34. The spring end 40 is preferably secured to the handle adjacent the rear end thereof as shown. The arrangement is such that the spring 39 normally urges the sharpener 34 and connected button 38 in an upward direction and any appropriate means may be provided to limit such upward movement. Furthermore, the sharpener 34 and/or button 38 may cooperate with appropriate guide means provided on or within the handle 1 so as to be confined to a particular path of movement.

Sharpening means 42 is provided on the sharpener 34 and is arranged so as to be operative to automatically sharpen the cutting edge 17 of the blade 10. In the arrangement shown, the sharpening means 42 is not engageable with the blade cutting edge 17 when the button 38 is depressed, but is so engageable when the button 38 is allowed to move upwards under the influence of its biasing spring 39. It is an important feature of the construction shown that the tip 19 of the blade 10 is located rearwards of the sharpening means 42 when the blade 10 is fully retracted.

With the foregoing arrangement, it is necessary to depress the release button 38 to permit extension of the blade 10 and as a consequence the blade 10 does not contact the sharpening means 42, at least during the initial part of that extension movement. If the button 38 is released during the course of that movement, there may be sharpening engagement, but that is not essential nor is it preferred. When the blade 10 is fully extended, the button 38 is released so that the sharpening means 42 is moved into engagement with part of the blade cutting edge 17 which is located within the handle 1 and is therefore not normally operative.

Retraction of the blade 10 does not require depression of the release button 38. Consequently, the sharpening means 42 remains in engagement with and sharpens the cutting edge 17 during movement of the blade 10 back into the handle 1. Furthermore, that sharpening is effected up to the very tip 19 of the blade 10 because the blade 10 is moved rearwardly beyond the sharpening means 42 when adopting the fully retracted position. Such full retraction has the affect of automatically conditioning the stop means to be operative, because the spring

39 urges the sharpener 34 into its uppermost position when the blade 10 moves clear of the sharpening means 42.

As will be apparent from Figures 9 to 11, the stop part 36 is provided with a ramp surface 45 and the stop part 25 is provided with a ramp surface 46. The ramp surfaces 45 and 46 may be flat or curved as required. When the stop part 25 is located forwardly of the stop part 36, the ramp surfaces 45 and 46 are arranged in opposed relationship as shown by Figure 11. Rearward movement of the carrier 20 results in those two surfaces 45 and 46 engaging with the consequence that the sharpener 34 is ramped upwards against the action of the spring 39, and the carrier 20 can continue to move rearward. The stop means is thereby automatically rendered inoperative during rearward movement of the carrier. Other arrangements could be adopted to achieve the same result.

The sharpening means 42 can be of any suitable form. In the construction shown, it comprises a device having a pair of cutting plates 43 of tungsten carbide or other suitable material and which are relatively arranged to define a V-shaped sharpening recess 44 between them. Preferably, the plates 43 overlap to define that recess 44 and are in face to face relationship. It is further preferred that the plates 43 slope upwardly and rearwardly to facilitate a relatively smooth sharpening action during retraction of the blade 10.

Since the two plates 43 are out of lateral alignment, only one will be engaged by the blade 10 during the final part of the retracting movement of the blade 10 over the sharpening device 42. That may cause lateral deflection of the blade 10 and consequently an absence of sharpening at one side of the blade tip. If such deflection does occur, a third blade or a rubbing member may be located opposite to the rearmost plate 43 of the pair referred to. That third blade or rubbing member can be arranged to prevent or minimise the aforementioned deflection and thereby ensure that effective sharpening of the blade 10 is carried up to the tip 19 of the blade 10.

A channel-shaped metal insert 47 (Figures 6 and 15) is preferably provided at the top of the handle opening 9. That insert 47 receives an upper edge portion of the knife blade 10 and provides a rigid and wear resistant support against which the upper edge 11 of the blade 10 can bear during use and movement into and out of the handle 1.

It will be apparent from the foregoing description that the present invention provides an effective knife of the retractable blade type, particularly in the ability to prevent inadvertent extension of the blade and to also provide for self-sharpening of the blade.

Various alterations, modifications and/or additions may be introduced into the constructions and arrangements of parts previously described without departing from the spirit or ambit of the invention as defined by the appended claims.

Claims

1. A retractable blade knife including, a hollow handle (1), a blade opening (9) at a front end of said handle (1), a blade carrier (20) mounted within said handle (1) for movement relative thereto, connecting means (21,23) whereby a blade (10) can be connected to and removed from said carrier (20), said carrier (20) being movable between a rest position at which a blade (10) connected to said carrier (20) is contained within said handle (1) and a forward position at which the said blade (10) is projected through said opening (9) beyond said handle front end, and actuator means (27) operable to cause said carrier movement; characterised in that a blade sharpener (34) is located within said handle (1) adjacent said opening (9) and being operable to engage the cutting edge (17) of the said blade (10) so as to sharpen that edge (17) during movement of said blade (10) through said opening (9), and that a sharpener release means (38) is selectively operable to render said sharpener (34) inoperable.
2. A knife according to claim 1, wherein a said blade (10) is releasably connected to said carrier (20), and said carrier (20) is removable from said handle (1) through a rear end thereof to permit removal and connection of a said blade (10) respectively from and to said carrier (20).
3. A knife according to claim 2, wherein a rear end portion (7) of said handle (1) is removable from the main body (13) of the handle (1) to permit movement of said carrier (20) through said rear end.
4. A knife according to claim 2 or 3, wherein said rear end portion (7) is slidably connected to said main body (13) for relative movement in a direction transverse to the longitudinal axis of said handle (1).
5. A knife according to claim 2, 3 or 4, wherein snap engaging means (15) acts between said rear end portion (7) and said main body (13) so as to resist removal of said rear end portion (7) from the main body (1).
6. A knife according to any preceding claim, wherein biasing means (39) urges said sharpener (34) towards a stop position at which the sharpener (34) prevents movement of a said blade (10) forwardly through said opening (9), and said release means (38) is operable to move said sharpener (34) away from said stop position and into a release position at which a said blade (10) is able to be moved forwardly through said opening (9).
7. A knife according to claim 6, wherein co-operable parts (36,25) of said sharpener (34) and said carrier (20) are engageable to prevent forward movement of said carrier (20) to a position at which said blade (10) extends over said sharpening means (42).
8. A knife according to claim 7, wherein said co-operable parts (36,25) do not prevent rearward movement of said carrier (20) from said forward position to said rest position.
9. A knife according to any preceding claim, wherein said sharpener (34) includes sharpening means (42) which is engageable with said blade edge (17), and said sharpening means (42) is located for-



39 urges the sharpener 34 into its uppermost position when the blade 10 moves clear of the sharpening means 42.

As will be apparent from Figures 9 to 11, the stop part 36 is provided with a ramp surface 45 and the stop part 25 is provided with a ramp surface 46. The ramp surfaces 45 and 46 may be flat or curved as required. When the stop part 25 is located forwardly of the stop part 36, the ramp surfaces 45 and 46 are arranged in opposed relationship as shown by Figure 11. Rearward movement of the carrier 20 results in those two surfaces 45 and 46 engaging with the consequence that the sharpener 34 is ramped upwards against the action of the spring 39, and the carrier 20 can continue to move rearward. The stop means is thereby automatically rendered inoperative during rearward movement of the carrier. Other arrangements could be adopted to achieve the same result.

The sharpening means 42 can be of any suitable form. In the construction shown, it comprises a device having a pair of cutting plates 43 of tungsten carbide or other suitable material and which are relatively arranged to define a V-shaped sharpening recess 44 between them. Preferably, the plates 43 overlap to define that recess 44 and are in face to face relationship. It is further preferred that the plates 43 slope upwardly and rearwardly to facilitate a relatively smooth sharpening action during retraction of the blade 10.

Since the two plates 43 are out of lateral alignment, only one will be engaged by the blade 10 during the final part of the retracting movement of the blade 10 over the sharpening device 42. That may cause lateral deflection of the blade 10 and consequently an absence of sharpening at one side of the blade tip. If such deflection does occur, a third blade or a rubbing member may be located opposite to the rearmost plate 43 of the pair referred to. That third blade or rubbing member can be arranged to prevent or minimise the aforementioned deflection and thereby ensure that effective sharpening of the blade 10 is carried up to the tip 19 of the blade 10.

A channel-shaped metal insert 47 (Figures 6 and 15) is preferably provided at the top of the handle opening 9. That insert 47 receives an upper edge portion of the knife blade 10 and provides a rigid and wear resistant support against which the upper edge 11 of the blade 10 can bear during use and movement into and out of the handle 1.

It will be apparent from the foregoing description that the present invention provides an effective knife of the retractable blade type, particularly in the ability to prevent inadvertent extension of the blade and to also provide for self-sharpening of the blade.

Various alterations, modifications and/or additions may be introduced into the constructions and arrangements of parts previously described without departing from the spirit or ambit of the invention as defined by the appended claims.

Claims

1. A retractable blade knife including, a hollow handle (1), a blade opening (9) at a front end of said handle (1), a blade carrier (20) mounted within said handle (1) for movement relative thereto, connecting means (21,23) whereby a blade (10) can be connected to and removed from said carrier (20), said carrier (20) being movable between a rest position at which a blade (10) connected to said carrier (20) is contained within said handle (1) and a forward position at which the said blade (10) is projected through said opening (9) beyond said handle front end, and actuator means (27) operable to cause said carrier movement; characterised in that a blade sharpener (34) is located within said handle (1) adjacent said opening (9) and being operable to engage the cutting edge (17) of the said blade (10) so as to sharpen that edge (17) during movement of said blade (10) through said opening (9), and that a sharpener release means (38) is selectively operable to render said sharpener (34) inoperable.

2. A knife according to claim 1, wherein a said blade (10) is releasably connected to said carrier (20), and said carrier (20) is removable from said handle (1) through a rear end thereof to permit removal and connection of a said blade (10) respectively from and to said carrier (20).

3. A knife according to claim 2, wherein a rear end portion (7) of said handle (1) is removable from the main body (13) of the handle (1) to permit movement of said carrier (20) through said rear end.

4. A knife according to claim 2 or 3, wherein said rear end portion (7) is slidably connected to said main body (13) for relative movement in a direction transverse to the longitudinal axis of said handle (1).

5. A knife according to claim 2, 3 or 4, wherein snap engaging means (15) acts between said rear end portion (7) and said main body (13) so as to resist removal of said rear end portion (7) from the main body (1).

6. A knife according to any preceding claim, wherein biasing means (39) urges said sharpener (34) towards a stop position at which the sharpener (34) prevents movement of a said blade (10) forwardly through said opening (9), and said release means (38) is operable to move said sharpener (34) away from said stop position and into a release position at which a said blade (10) is able to be moved forwardly through said opening (9).

7. A knife according to claim 6, wherein co-operable parts (36,25) of said sharpener (34) and said carrier (20) are engageable to prevent forward movement of said carrier (20) to a position at which said blade (10) extends over said sharpening means (42).

8. A knife according to claim 7, wherein said co-operable parts (36,25) do not prevent rearward movement of said carrier (20) from said forward position to said rest position.

9. A knife according to any preceding claim, wherein said sharpener (34) includes sharpening means (42) which is engageable with said blade edge (17), and said sharpening means (42) is located for-



wardly of a front end of a said blade (10) when said carrier (20) is in said rest position.

10. A knife according to claim 9, wherein said sharpener (34) includes a body member (35), and said sharpening means (42) is secured to that body member (35) and defines a V-shaped sharpening recess (44) for receiving the cutting edge (17) of a said blade (10).

11. A knife according to claim 10 when appended to claim 6, wherein said biasing means (39) includes a spring arm (39) which extends longitudinally of a passage (2) and has its opposite ends connected to said handle (1) and said body member (35) respectively.

12. A knife according to claim 10 or 11, wherein said sharpening means (42) includes two overlapping cutter plates (43), and said cutter plates (43) slope upwardly and rearwardly.

13. A knife according to claim 10 when appended to claim 7, wherein one of said cooperable parts (36,25) comprises an arm (37) secured to and extending rearwardly from said body member (35) and a lateral projection (36) provided on a rear end portion of said arm (37), and the other said cooperable part (25) is provided on a front end portion of said carrier (20).

14. A knife according to claim 13, wherein a ramp surface (45,46) is provided on each said cooperable part (36,25), and said ramp surfaces (45,46) engage during rearward movement of said carrier (20) so as to render said cooperable parts (36,25) inoperable to prevent said rearward movement.

15. A knife according to any one of claims 6 to 8, wherein said handle (1) has an upper wall (3), a lower wall (4) and two side walls (5,6), each of said walls extends between front and rear ends of said handle (1), a passage (2) is defined between said walls, said carrier (20) is located within said passage (2), and said biasing means (39) urges said sharpener (34) in a direction towards said upper wall (3).

16. A knife according to claim 15, wherein said release means (38) includes a button (38) connected to said sharpener (34) and which projects upwardly through and beyond said upper wall (3) at least when said sharpener (34) is in said stop position.

17. A knife according to any one of claims 6 to 8, wherein said sharpener (34) is positioned between said stop and release positions when engaging a cutting edge (17) of a said blade (10).

18. A knife according to any one of claims 6, 7, 8 and 17, wherein guide means is provided on said handle (1) and cooperates with said sharpener (34) to guide said sharpener (34) in its movement between said stop and release positions.

19. A knife according to any preceding claim, wherein stop means (36,25) is operative to prevent movement of said carrier (20) forwardly from said rest position to a position at which said sharpening means (42) is operatively engageable with said blade edge (17), and said release means (38) is operable to render said stop means (36,25) inoperative.

20. A knife according to any preceding claim, wherein said actuator means (27) includes a lever (27) which is pivotally connected at an inner end (28) to said carrier (20) so as to be movable relative

thereto between operative and stored positions, said lever (27) projects laterally outwards of said handle (1) when in said operative position and is substantially contained within said handle (1) when in said stored position.

21. A knife according to claim 20, wherein said lever (27) projects outwardly through an elongate opening (30) in said handle (1) when in said operative position, and the outer end (33) of the lever (27) is engageable with respective opposite ends of said opening (30) when in the stored position according to whether said carrier (20) is in the rest or forward position respectively.

22. A knife according to claim 20 or 21, wherein releasable locking means (27,31) is operable to prevent movement of said carrier (20) out of said forward position.

23. A knife according to claim 22, wherein said actuator means (27) forms at least part of said locking means (27,31).

Revendications

1. Couteau à lame rétractable qui comprend un manche creux (1), une ouverture (9) de passage de la lame située à l'extrémité avant dudit manche (1), un porte-lame (20) monté dans ledit manche pour pouvoir se déplacer par rapport à celui-ci, des moyens d'assemblage (21, 23) grâce auxquels une lame (10) peut être fixée audit porte-lame (20) et en être séparée, ledit portelame (20) pouvant se déplacer entre une position de repos dans laquelle une lame (10) est assemblée audit porte-lame (20) est contenue dans ledit manche (1) et une position avant dans laquelle ladite lame (10) est une saillie à travers ladite ouverture (9) au-delà de l'extrémité avant dudit manche, et des moyens actionneurs (27) pouvant être mis en action pour provoquer ledit mouvement du porte-lame, caractérisé en ce qu'un affûteur de lame (34) est placé à l'intérieur du manche (1), dans la région adjacente à ladite ouverture (9) et pouvant être mis en action pour attaquer le bord tranchant (17) de ladite lame (10) de manière à affûter ce bord (17) pendant le mouvement que la lame (10) décrit à travers ladite ouverture (9), et en ce que des moyens de dégagement (38) de l'affûteur peuvent être mis sélectivement en action pour rendre ledit affûteur (34) inopérant.

2. Couteau selon la revendication 1, dans lequel une dite lame (10) est assemblée audit porte-lame (20) par une liaison démontable, et ledit porte-lame (20) peut être extrait dudit manche (1) à travers une ouverture arrière de ce dernier pour permettre d'enlever et d'y assembler une dite lame (10) respectivement du et audit porte-lame (20).

3. Couteau selon la revendication 2, dans lequel une partie d'extrémité arrière (7) dudit manche (1) peut être séparée du corps principal (13) du manche (1) pour permettre audit porte-lame (20) de passer à travers ladite extrémité arrière.

4. Couteau selon la revendication 2 ou 3, dans lequel ladite partie d'extrémité arrière (7) est reliée à coulissement audit corps principal (13) pour se déplacer en mouvement relatif dans une direction transversale à l'axe longitudinal dudit manche (1).



5. Couteau selon la revendication 2, 3 ou 4, dans lequel des moyens d'encliquetage (15) agissent entre ladite partie d'extrémité arrière (7) et ledit corps principal (13) de manière à résister à la séparation entre ladite partie d'extrémité arrière (7) et le corps principal (1).

6. Couteau selon une quelconque des revendications précédentes, dans lequel des moyens de sollicitation (39) sollicitent ledit affûteur (34) vers une position d'arrêt dans laquelle l'affûteur (34) empêche ladite lame (10) d'avancer à travers ladite ouverture (9) et lesdits moyens de dégagement (38) peuvent être actionnés pour écarter ledit affûteur (34) de ladite position d'arrêt et le placer dans la position de dégagement dans laquelle la lame (10) peut être poussée vers l'avant à travers ladite ouverture (9).

7. Couteau selon la revendication 6, dans lequel des parties (36, 25) dudit affûteur (34) et dudit portelame (20) qui peuvent coopérer entre elles peuvent être mises en prise pour empêcher ledit portelame (20) d'avancer jusqu'à une position dans laquelle ladite lame (10) s'étend au-dessus desdits moyens d'affûtage (42).

8. Couteau selon la revendication 7, dans lequel lesdites parties (36, 25) qui peuvent coopérer entre elles n'empêchent par ledit portelame (20) de reculer de ladite position avant à ladite position de repos.

9. Couteau selon une quelconque des revendications précédentes, dans lequel ledit affûteur (34) comprend des moyens d'affûtage (42) qui peuvent être mis en prise avec ledit bord (17) de la lame et lesdits moyens d'affûtage (42) sont placés en avant d'une extrémité avant de ladite lame (10) lorsque ledit portelame (20) se trouve dans ladite position de repos.

10. Couteau selon la revendication 9, dans lequel ledit affûteur (34) comprend un corps (35), et lesdits moyens d'affûtage (42) sont fixés audit corps (35) et définissent une encoche d'affûtage (44) en forme de V destinée à recevoir le bord tranchant (17) de ladite lame (10).

11. Couteau selon la revendication 10 rattachée à la revendication 6, dans lequel lesdits moyens de sollicitation (39) comprennent un bras à ressort (39) qui s'étend dans la direction longitudinale d'un passage (2) et dont les extrémités opposées sont reliées respectivement audit manche (1) et audit corps (35).

12. Couteau selon la revendication 10 ou 11, dans lequel lesdits moyens d'affûtage (42) comprennent deux plaquettes de coupe (43) qui se chevauchent, et lesdites plaquettes de coupe (43) sont inclinées vers le haut et vers l'arrière.

13. Couteau selon la revendication 10 rattachée à la revendication 7, dans lequel une desdites parties (36, 35) qui peuvent coopérer entre elles comprennent un bras (37) fixé audit corps (35) et qui s'étend vers l'arrière à partir de ce corps, et une saillie latérale (36) prévue sur une portion d'extrémité arrière dudit bras (37), tandis que l'autre (25) desdites parties qui peuvent coopérer entre elles est prévue sur une partie d'extrémité avant dudit portelame (20).

14. Couteau selon la revendication 13, dans lequel une surface de rampe (45, 46) est prévue sur

chacune desdites parties (36, 25) qui peuvent coopérer entre elles, et lesdites surfaces de rampes (45, 46) entrent en prise entre elles pendant le mouvement dudit portelame (20) vers l'arrière de manière à rendre lesdites parties (36, 25) qui peuvent coopérer entre elles inopérantes pour empêcher ledit mouvement vers l'arrière.

15. Couteau selon une quelconque des revendications 6 à 8, dans lequel le manche (1) possède une paroi supérieure (3), une paroi inférieure (4) et deux parois latérales (5, 6), chacune desdites parois s'étend entre les extrémités avant et arrière dudit manche (1), un passage (2) est défini entre lesdites parois, ledit portelame (20) est placé dans ledit passage (2), et lesdits moyens de sollicitation (39) tendent à repousser ledit affûteur (34) vers ladite paroi supérieure (3).

16. Couteau selon la revendication 15, dans lequel lesdits moyens de dégagement (38) comprennent un bouton (38) relié audit affûteur (34) et qui fait saillie vers le haut à travers ladite paroi supérieure (3) et au-delà de cette paroi, au moins lorsque ledit affûteur (34) se trouve dans ladite position d'arrêt.

17. Couteau selon une quelconque des revendications 6 à 8, dans lequel ledit affûteur (34) est positionné entre lesdites positions d'arrêt et de dégagement lorsqu'il attaque un bord tranchant (17) de ladite lame (10).

18. Couteau selon une quelconque des revendications 6, 7, 8 et 17, dans lequel des moyens de guidage sont prévus sur ledit manche (1) et coopèrent avec ledit affûteur (34) pour guider ledit affûteur (34) dans son mouvement entre lesdites positions d'arrêt et de dégagement.

19. Couteau selon une quelconque des revendications précédentes, dans lequel les moyens d'arrêt (36, 25) peuvent entrer en action pour empêcher le mouvement dudit portelame (20) vers l'avant de ladite position de repos à une position dans laquelle lesdits moyens d'affûtage (42) peuvent être mis en prise fonctionnelle avec ledit bord (17) de la lame, et lesdits moyens de dégagement (38) peuvent être mis en action pour rendre lesdits moyens d'arrêt (36, 25) inactifs.

20. Couteau selon une quelconque des revendications précédentes, dans lequel lesdits moyens actionneurs (27) comprennent un levier (27) qui est articulé sur ledit portelame (20) à son extrémité intérieur (28) de manière à pouvoir se déplacer par rapport à ce portelame entre une position active et une position escamotée, ledit levier (27) fait saillie latéralement à l'extérieur dudit manche (1) lorsqu'il se trouve dans ladite position active et il est sensiblement contenu dans ledit manche (1) lorsqu'il est dans ladite position escamotée.

21. Couteau selon la revendication 20, dans lequel ledit levier (27) fait saillie à l'extérieur à travers une ouverture allongée (30) formée dans ledit manche (1) lorsqu'il se trouve dans ladite position active et l'extrémité extérieure (33) du levier (27) peut être mise en prise avec des extrémités respectives opposées de ladite ouverture (30) lorsqu'il se trouve dans la position escamotée, selon que ledit portelame (20) se trouve respectivement dans la position de repos ou dans la position avant.



22. Couteau selon la revendication 20 ou 21, dans lequel des moyens de verrouillage déverrouillables (27, 31) peuvent être mis en action pour empêcher ledit porte-lame (20) de s'écarter de ladite position avant.

23. Couteau selon la revendication 22, dans lequel lesdits moyens actionneurs (27) forment au moins une partie desdits moyens de verrouillage (27, 31).

Patentansprüche

1. Messer mit einziehbarer Klinge, das einen hohlen Handgriff (1), einen Klingenöffnung (9) an einer Stirnseite des Handgriffs (1), einen innerhalb des Handgriffs (1) montierten Klingenträger (20), der eine zu diesem relative Bewegung ausführen kann, Verbindungsmittel (21, 23), durch die eine Klinge (10) mit dem Träger (20) verbunden und von diesem entfernt werden kann, wobei der Träger (20) zwischen einer Ruheposition, in der eine mit dem Träger (20) verbundene Klinge (10) in den Handgriff (1) eingezogen ist, und einer vorgeschobenen Position hin- und herbewegbar ist, in der die Klinge (10) durch die Öffnung (9) über die Stirnseite des Handgriffs hinausragt, sowie eine Betätigungseinrichtung (27) aufweist, die dazu dient, die Bewegung des Trägers (20) zu bewirken; dadurch gekennzeichnet, daß innerhalb des Handgriffs (1) nahe bei der Öffnung (9) ein Klingenschärfer (34) angeordnet ist, der dazu dient, mit der Schneidkante (17) der Klinge (10) in Eingriff zu gelangen, um so während der Bewegung der Klinge (10) durch die Öffnung (9) diese Kante (17) zu schärfen, und daß eine Freigabeeinrichtung (38) für den Schärfer wahlweise betätigbar ist, um den Schärfer (34) unwirksam zu machen.

2. Messer nach Anspruch 1, bei dem eine Klinge (10) lösbar mit dem Träger (20) verbunden ist und bei dem der Träger (20) von dem Handgriff (1) durch dessen hinteres Ende hindurch entfernbar ist, um das Entfernen und Anbringen einer Klinge (10) von dem bzw. an den Träger (20) zu ermöglichen.

3. Messer nach Anspruch 2, bei dem ein hinterer Endabschnitt (7) des Handgriffs (1) von dem Hauptkörper (13) des Handgriffs (1) entfernbar ist, um die Bewegung des Trägers (20) durch das hintere Ende zu ermöglichen.

4. Messer nach einem der Ansprüche 2 oder 3, bei dem der hintere Endabschnitt (2) steckbar mit dem Hauptkörper (13) verbunden und in einer Richtung quer zu der Längsachse des Handgriffs (1) relativ zu diesem bewegbar ist.

5. Messer nach einem der Ansprüche 2, 3 oder 4, bei dem zwischen dem hinteren Endabschnitt (7) und dem Hauptkörper (13) ein Schnappverschlusmechanismus (15) wirkt, um einem Abnehmen des hinteren Endabschnitts (7) von dem Hauptkörper (13) entgegenzuwirken.

6. Messer nach einem der vorhergehenden Ansprüche, bei dem ein Vorspannmittel (39) den Schärfer (34) auf eine Stopp-Position zu drückt, in der der Schärfer (34) eine Bewegung der Klinge (10) vorwärts durch die Öffnung (9) verhindert, und bei dem die Freigabeeinrichtung (38) dazu dient, den

Schärfer (34) aus der Stopp-Position heraus und in eine Freigabeposition zu bewegen, in welcher die Klinge (10) vorwärts durch die Öffnung (9) bewegt werden kann.

7. Messer nach Anspruch 6, bei dem miteinander zusammenwirkende Teile (36, 25) des Schärfers (34) und des Trägers (20) miteinander in Eingriff bringbar sind, um eine Vorwärtsbewegung des Trägers (20) in eine Position zu verhindern, in welcher die Klinge (10) sich über die Schärfungseinrichtung (42) hinaus erstreckt.

8. Messer nach Anspruch 7, bei dem die miteinander zusammenwirkenden Teile (36, 25) eine Rückwärtsbewegung des Trägers (20) aus der vorgeschobenen Position in die Ruheposition nicht verhindern.

9. Messer nach einem der vorhergehenden Ansprüche, bei dem der Schärfer (34) eine Schärfungseinrichtung (42) aufweist, die mit der Messerkante (17) in Eingriff bringbar ist, und bei dem die Schärfungseinrichtung (42) vor einem Vorderende der Klinge (10) angeordnet ist, wenn sich der Träger (20) in der Ruheposition befindet.

10. Messer nach Anspruch 9, bei dem der Schärfer (34) einen Grundkörper (35) aufweist und bei dem die Schärfungseinrichtung (42) mit dem Grundkörper (35) verbunden ist sowie eine V-förmige Schleifkerbe (44) begrenzt, die die Schneidkante (17) einer Klinge (10) aufnimmt.

11. Messer nach Anspruch 10 und 6, bei dem das Vorspannmittel (39) einen Feserstab (39) aufweist, welcher sich in Längsrichtung eines Durchgangs (2) erstreckt und dessen entgegengesetzte Enden mit dem Handgriff (1) bzw. dem Grundkörper (35) verbunden sind.

12. Messer nach einem der Ansprüche 10 oder 11, bei dem die Schärfungseinrichtung (42) zwei sich überdeckende Schneidplatten (43) aufweist, und bei dem die Schneidplatten (43) schräg nach oben und nach hinten verlaufen.

13. Messer nach den Ansprüchen 10 und 7, bei dem einer der zusammenwirkenden Teile (36, 25) einen Arm (37), der an dem Grundkörper (35) befestigt ist und sich von diesem rückwärts erstreckt, sowie einen seitlichen Vorsprung (36) aufweist, der an einem hinteren Endbereich des Armes (37) vorgesehen ist, und bei dem der andere zusammenwirkende Teil (25) an einem vorderen Endabschnitt des Trägers (20) vorgesehen ist.

14. Messer nach Anspruch 13, bei dem eine Rampenfläche (45, 46) an jedem der zusammenwirkenden Teile (45, 26) vorgesehen ist und bei dem die Rampenflächen (45, 46) während der Rückwärtsbewegung des Trägers (20) miteinander in Eingriff sind, um die zusammenwirkenden Teile (36, 25) unwirksam machen zu können, damit sie die Rückwärtsbewegung nicht behindern.

15. Messer nach einem der Ansprüche 6 bis 8, bei dem der Handgriff (1) eine obere Wand (3), eine untere Wand (4) und zwei Seitenwände (5, 6) aufweist, sich jede Wand zwischen dem Vorder- und dem Hinterende des Handgriffs (1) erstreckt, zwischen den Wänden ein Durchgang (2) begrenzt ist, der Träger (20) innerhalb des Durchganges (2) angeordnet ist und das Vorspannmittel (39) den Schär-



fer (34) in einer Richtung auf die obere Wand (3) zu drückt.

16. Messer nach Anspruch 15, bei dem die Freigabeeinrichtung (38) einen mit dem Schärfer (34) verbundenen Knopf (38) aufweist, der zumindest, wenn der Schärfer (34) in der Stopp-Position ist, nach oben durch die obere Wand (3) hindurch und über diese hinaus zeigt.

17. Messer nach einem der Ansprüche 6 bis 8, bei dem der Schärfer (34) sich zwischen der Stopp- und der Freigabeposition befindet, wenn er mit einer Schneidkante (17) einer Klinge (10) in Eingriff ist.

18. Messer nach einem der Ansprüche 6, 7, 8 oder 17, bei dem an dem Handgriff (1) ein Führungsglied vorgesehen ist, das mit dem Schärfer (34) zusammenwirkt, um den Schärfer (34) bei dessen Bewegung zwischen der Stopp- und der Freigabeposition zu führen.

19. Messer nach einem der vorhergehenden Ansprüche, bei dem eine Stoppeinrichtung (36, 25) dazu dient, eine Bewegung des Trägers (20) aus der Ruheposition heraus nach vorwärts in eine Position zu verhindern, in der die Schärfungseinrichtung (42) wirksam mit der Klingenkante (17) in Eingriff bringbar ist, und bei dem die Freigabeeinrichtung (38) dazu dient, die Stoppeinrichtung (36, 25) unwirksam zu machen.

20. Messer nach einem der vorhergehenden Ansprüche, bei dem die Betätigungseinrichtung einen Hebel (27) aufweist, der an seinem inneren Ende (28) schwenkbar mit dem Träger (20) verbunden ist, um relativ zu diesem zwischen einer Betätigungsstellung und einer Aufbewahrungsstellung hin- und herbewegt zu werden, wobei der Hebel (27) in der Betätigungsstellung seitlich aus dem Handgriff (1) hervorsteht und in der Aufbewahrungsstellung im wesentlichen innerhalb des Handgriffs (1) liegt.

21. Messer nach Anspruch 20, bei dem der Hebel (27) in der Betätigungsstellung durch eine längliche Öffnung (30) in dem Handgriff (1) nach außen hervorsteht und bei dem das äußere Ende (33) des Hebels (27) in der Aufbewahrungsstellung mit entsprechend gegenüberliegenden Enden der Öffnung (30) in Eingriff bringbar ist, je nachdem, ob der Träger (20) in der Ruheposition oder in der vorgeschobenen Position ist.

22. Messer nach Anspruch 20 oder 21, bei dem eine lösbare Sicherungseinrichtung (27, 31) dazu dient, die Bewegung des Trägers (20) aus der vorgeschobenen Position heraus zu verhindern.

23. Messer nach Anspruch 22, bei dem die Betätigungseinrichtung (27) zumindest einen Teil der Sicherungseinrichtung (27, 31) bildet.

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