A jack knife has a pair of handle half sections that can be split apart and rotated 180° to move a blade back and forth between its stored and exposed positions. The handle half sections become locked together as a unitary handle when the blade is in its stored and exposed positions.

1 Claim, 8 Drawing Figures
SPLIT HANDLE JACK KNIFE

This invention relates to a jack knife or field knife and more specifically to a jack knife with split handle sections that can be maneuvered with a single hand to expose and store a cutting blade that need not be grasped or otherwise contacted by the person's hand.

BACKGROUND OF THE INVENTION

Conventional jack knives ordinarily have one or more blades pivoted at their proximal ends to one of the extreme ends of the jack knife housing that constitutes a handle.

The blunt edge of a blade must be gripped and ordinarily vigorously tugged to pull the blade from a retracted or stored position to an extended or exposed position. Since blades frequently become jammed, fingernails are often torn and fingers pinched during the tugging effort.

One hand must be used to grasp and stabilize the jack knife housing or sheath while the other is maneuvered to move the blade. Thus no hand is left free for servicing or handling other matters.

A severe danger prevails when the blade is finally swung to its fully extended position. Since conventional cam and/or spring latching mechanisms for temporarily locking blades in their extended positions are relatively weak, then minor forces or nudges are sufficient to override the latching mechanisms. When this situation arises, the blade is caused to snap or otherwise collapse upon the unwary person's hand.

Many conventional jack knives also incorporate locking or latching mechanisms that include components which become exposed when the blade is in its extended position. This creates an opportunity for these components to catch upon a person's clothes or other articles to thus interfere with a cutting operation.

BRIEF SUMMARY OF THE INVENTION

Briefly stated, the present invention contemplates a safe, handy and reliable jack knife or field knife that can be swiftly and easily opened and closed with a single hand by a person having ordinary manual dexterity.

The knife incorporates a pair of complementary handle half sections whose inner sides define a blade storage slot. A coupling such as a pivot pin interconnects the handle half section rear ends and the blade proximal end so that the half sections can be rotated in opposite directions through approximately 180° arcs relative to the blade axis. By thus relatively rotating the handle half sections, the blade can be moved between a stored position in the blade storage slot and an exposed position entirely outside of the slot.

One locking means positioned adjacent the handle half section front ends serve to lock the handle half sections together as a unitary handle when the blade is either in its stored or exposed position. The locking means may be characterized by a locking pin located on the inner side of one handle half section and a locking hole positioned on the inner side of the opposing handle half section, the pin and hole being positioned and sized for secure interengagement.

A notch is formed in the edge of one handle half section to permit entrance of a person's finger for prying apart the handle half sections and overcoming the locking means so that the handle half sections can be quickly split apart and relatively rotated to different extreme positions.

Interconnecting the handle half section rearward ends and blade proximal end is a stop means arranged to stop relative rotation of the handle half sections when they are rotated through an approximate 180° arc relative to the blade axis. Preferably the stop means is characterized by a pair of guide slots formed on the inner sides of the handle half section rearward ends and a pair of guide pins coupled to opposing sides of the blade proximal end, the pins projecting into the corresponding guide slots. Both the locking means and stop means become concealed within the handle half sections when the blade is stored or exposed so that none of their components is permitted to catch upon some external article during a cutting operation.

BRIEF DESCRIPTION OF THE DRAWINGS

The numerous benefits and unique aspects of the present invention will be fully understood when the following detailed description is studied in conjunction with the drawings in which:

FIG. 1 is a perspective view, showing the blade positioned in its blade storage slot defined by the handle half sections;

FIG. 2 is a bottom view as indicated by arrow 2 of FIG. 1, showing a pair of adjacent notches formed in the handle half sections;

FIG. 3 is a sectional view taken along line 3—3 of FIG. 2, showing how a person can use the notches to spread the handle half sections apart in order to relatively rotate the handle half sections for either exposing or storing the blade;

FIG. 4 is a perspective view showing the handle half sections being rotated between their extreme positions;

FIG. 5 is a side view, showing the handle half sections rotated approximately 180° relative to the blade axis in order to completely expose the blade;

FIG. 6 is an exploded fragmentary view taken along line 6—6 of FIG. 1, showing the stop means components when the blade is stored;

FIG. 7 is an exploded fragmentary view taken along line 7—7 of FIG. 5, showing the stop means components when the blade is fully exposed; and,

FIG. 8 is an exploded fragmentary view similar to that of FIG. 6, showing an alternative embodiment of the stop means.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Turning now to the drawings for a full understanding of the present invention, FIG. 1 illustrates a split handle jack knife 10 having a pair of complementary handle half sections 11 and 12. Handle half section 11 includes a front end 13, a rear end 14, and an inner side 15. Similarly handle half section 12 includes a front end 16, a rear end 17, and an inner side 18. Handle half section inner sides 15 and 18 are parallel and spaced apart to define a blade storage slot 19. Positioned within blade storage slot 19 is a cutting blade 20 having a distal end 21 terminating in a sharp point, a proximal end 22, and a blunt edge 20A that partially projects from between the handle half sections 11 and 12 when blade 20 is folded to its stored position.

Formed in the upper edge of handle half section 12 is a guide recess 24 whose function will be subsequently described. Handle half section rearward ends 14 and 17 are coupled to each other and blade proximal end 22...
by a coupling 25 that is preferably a socket headed pivot pin. Coupling 25 mounts handle half sections 11 and 12 so that they can be split apart and relatively rotated in opposite directions in order to expose and store blade 20.

FIG. 2 shows the bottom side of jack knife 10 and illustrates the fact that handle half section 11 is constructed from a metal frame 26 recessed to tightly retain a wooden panel 27. Similarly, handle half section 12 includes a metal frame 28 fixed to a wooden panel 29. Metal frame 26 is formed with a notch 30 that is adjacent to and registers with a second notch 31 formed in metal frame 28.

FIG. 3 illustrates how a person can begin to fully expose the blade from a stored position or vice versa by merely using a single hand. Handle half section 11, which is wider than handle half section 12, is formed with a blade guard 32 that is contoured to shield or protect a person's hand from the blade cutting edge. Locking means 33 functions to lock together handle half sections 11 and 12 as a unitary handle when the blade is in its stored and exposed positions. Locking means 33 is characterized by a locking pin 34 that projects perpendicularly from inner side 15 and a locking hole 35 formed on inner side 18. Locking pin 34 and locking hole 35 are sized and positioned to become securely interengaged and are located adjacent the front ends of their respective handle half sections. Alternatively locking means 33 could be a spring detent arrangement or the like.

In order to loosen handle half sections 11 and 12 from one another, a person merely inserts his thumb 36 into notch 30 and presses against second notch 31 as indicated by force arrow 37. The thumb pressure will quickly pry apart handle half sections 11 and 12 and overcome the locking means 33, i.e.; pin 34 will be withdrawn from locking hole 35 so that handle half sections 11 and 12 can be split apart. When locking means 33 is unlocked, then handle half sections 11 and 12 can be relatively rotated in opposite directions as indicated by arrows 39 and 38 respectively. The handle half sections are mounted and relatively arranged so that handle half section 12, the one not formed with the blade guard 32, must first move relative to the blade. Thus handle half section 12 first begins its rotation relative to the blade after which handle half section 11 is rotated relative to the blade. When each handle half section has been rotated approximately 180°, then guide recess 24 will first engage locking pin 34 in order to permit locking pin 34 to be smoothly slid along inner side 18 into locking position within locking hole 35.

FIG. 4 shows a cutting edge 40 and longitudinal axis 41 of blade 20. Handle half section 12 is shown rotated approximately 90° relative to blade axis 41, and, the relative rotation between handle half section 11 and blade axis 41 is shown as approximately 50°.

FIG. 5 shows blade 20 in its fully exposed position and ready for use. This position is achieved when there has been a 360° relative rotation between handle half sections 11 and 12, a 180° relative rotation between blade axis 41 and handle half section 11, and, a 180° relative rotation between blade axis 41 and handle half section 12. The locking means also operates in this situation to unite the handle half sections together as a unitary, comfortable handle for the user.

FIG. 6 shows the structural interrelationship of various components that constitute a stop means when the blade 20 is at its stored position. The stop means generally operates to prevent the handle half sections 11 and 12 from rotating more than 180° relative to the blade axis and coacts with the locking means to safely stabilize the blade in its stored and exposed positions. The stop means includes a coupling aperture 42 and a 180° arcuate guide slot 43 formed in the rearward end 14 of handle half section 11. Similarly, a coupling aperture 44 and a 180° arcuate guide slot 45 are formed in the rearward end 17 of handle half section 12. A coupling aperture 46 formed through proximal end 22 of blade 20 is arranged to register with coupling apertures 42 and 44 so that the pivot pin coupling (not shown) may be received to join the handle half sections and blade together. Spaced equidistantly from coupling aperture 46 are diametrically opposed guide pins 47 and 48. Guide pin 47 is shaped to fit and slide within guide slot 43 and guide pin 48 is shaped to fit and slide within guide slot 45.

Referring to FIG. 7, when both handle half sections 11 and 12 have been rotated 180° relative to the blade axis, guide pin 47 will have travelled through a 180° arc along slot 43 and guide pin 48 will also have travelled through a 180° arc within guide slot 45. The extreme ends of the arcuate guide slots 43 and 45 prevent over-travel of the blade. Therefore, rather than being freely rotatable in which situation there would be a risk of injury, the movement of the blade is confined and predictable so that the user can become accustomed to the behavior and operation of the jack knife.

FIG. 8 shows an alternative embodiment of the stop means whose position is analogous to that of FIG. 6. In contrast with the embodiment of FIG. 6 where the arcuate guide slots are formed on the inner sides of the blade rearward ends and the guide pins are positioned on the blade proximal end, in the FIG. 8 stop means embodiment, the arcuate guide slots are formed on opposing sides of the blade proximal end and the guide pins are mounted on the handle half sections. Thus handle half section 11 is formed with a coupling aperture 49 and a guide pin 50. Handle half section 12 is formed with a coupling aperture 51 and a guide pin 52. Blade proximal end 22 is formed with coupling aperture 53, that registers with apertures 49 and 51, and a pair of arcuate guide slots 54 (only one of which is shown) on its opposing walls.

Both the locking means and stop means are fully concealed within the combined exterior surfaces of handle half sections 11 and 12 when blade 20 is in its fully stored and fully exposed positions. Thus no projecting component is presented that could catch upon the person's clothing or some article and disrupt some cutting action.

OPERATION

Keeping the above constructions in mind, it can be understood how many of the previously described disadvantages of conventional jack knives are overcome or substantially eliminated by the present invention.

In order to benefit from the advantages of the present invention and assuming that the user wants to open the jack knife 10 from its closed position as shown in FIG. 1, the user withdraws jack knife 10 from his
pocket or other location and orients it in a single hand with the bottom section facing upwardly as shown in FIG. 2. The user inserts his thumb 36, as shown in FIG. 3, into notch 30 and exerts pressure indicated by force arrow 37 against second notch 31. Soon handle half sections 11 and 12 will be pried apart to an extent where locking pin 34 will be retracted from locking hole 35. At this time, the rotational or pivoting movement of handle half section 12 is initiated in a direction indicated by arrow 38 shown in FIG. 3 and FIG. 4. As inner side 18 slides across inner side 15, the user’s thumb is protected from blade cutting edge 40 by blade guard 32.

In accordance with one contemplated manual technique for fully exposing blade 20, the user then flips jack knife 10 over, grasps front end 16 of handle half section 12 and, with a jerking or snap action swings handle half section 12 approximately 180° relative to blade axis 41. When the rotational movement of handle half section 12 is automatically stopped by the stop 20 means shown in FIG. 7, handle half section 11, which by this time will have become angularly displaced from blade axis 41 due to the jerking or snap action, is squeezed towards handle half section 12. In order to once again lock the handle half sections together as a unit, the user merely continues to squeeze the handle half sections together forcing locking pin 34 to enter guide recess 24, slide over inner side 18, and drop resiliently into locking hole 35.

With the blade now fully exposed and rigidly 30 oriented as shown in FIG. 5, jack knife 10 is ready for use. Since all the components of the stop means and locking means are concealed, they are prevented from catching on the user’s clothing or other article and so cannot interfere with the intended operation of jack knife 10.

In order to close jack knife 10 and return blade 20 to its stored position as shown in FIG. 1, the handle half sections are once again spread apart by exerting thumb pressure in notches 30 and 31. The handle half sections 11 and 12 are again split and rotated in opposite directions but in reverse directions from those followed while maneuvering blade 20 to its exposed position.

It should be noted that even if locking means 33 fails or is somehow disengaged while jack knife 10 is being used for cutting purposes, the stop means functions to virtually eliminate the possibility of blade 20 snapping or folding against the user’s hand. Since the user’s hand will be wrapped around the handle half sections and the user would naturally tend to increase gripping force if he sensed that components were becoming loose, blade 20 would be permitted only to wiggle or oscillate through a very limited arcuate range.

From the foregoing it will be evident that the present invention has provided a split handle jack knife in which all of the various advantages are fully realized.

What is claimed is:
1. A split handle jack knife capable of being opened and closed with one hand comprising:
   a. a first handle half section having a front end, rear end, and inner side;
   b. a blade guard formed on the inner side of the first handle half section;
   c. a second handle half section having a front end, rear end, and inner side, the handle half sections being of complementary shape and arranged so that their inner sides together with the blade guard define a blade storage slot;
   d. a blade having a proximal end, distal end, and cutting edge, the blade being positioned to move between a stored position in the blade storage slot and an exposed position outside of the slot;
   e. a pivot pin interconnecting the handle half section rear ends and the blade proximal end, the handle half sections being mounted for relative rotation in opposite directions in order to expose and store the blade;
   f. locking means for locking the handle half sections together as a unitary handle when the blade is in its stored and exposed positions, the locking means including a locking pin located on the inner side first handle half section and a locking hole positioned on the inner side of the second handle half section for securely interengaging with the locking pin, the locking pin and hole being positioned adjacent the front ends of their respective handle half sections;
   g. a first thumb notch formed in the edge of the first handle half section and a second thumb notch formed in the edge of the second handle half section positioned to register with the first thumb notch in order to permit entrance of a person’s thumb for prying apart the handle half sections and overcoming the locking means so that the handle half sections can be split apart and relatively rotated to different positions;
   h. stop means interconnecting of the handle half section rearward ends and blade proximal end for stopping relative rotation of the handle half sections when each is rotated through an approximately 180° arc relative to the blade axis, the stop means and locking means being concealed within the combined exterior surfaces of the handle half sections when the blade is in its stored and exposed positions; and,
   i. a guide recess on the edge of the second handle half section opposite the edge on which the second notch is located, the guide recess and a portion of the second notch constituting entrances to facilitate sliding movement of the locking pin towards and from the locking hole.

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