Nov. 11, 1952 J. HOPTA 2,617,187

FOLDABLE POCKET TOOL

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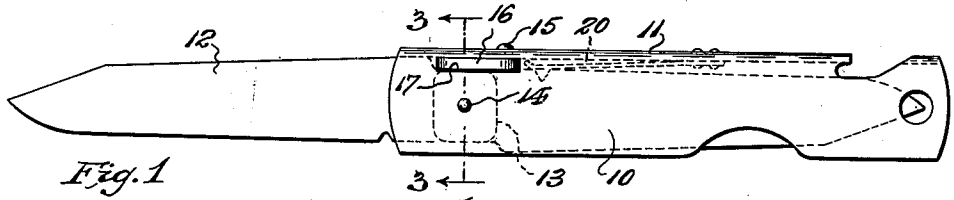


Fig. 1

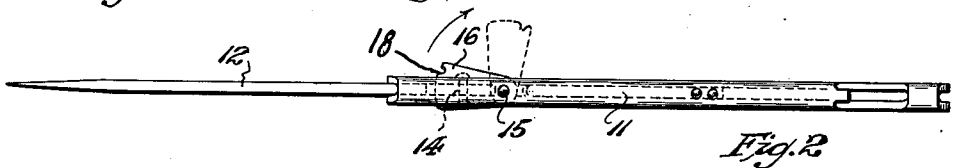


Fig. 2

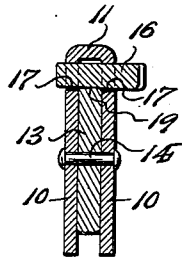


Fig. 3

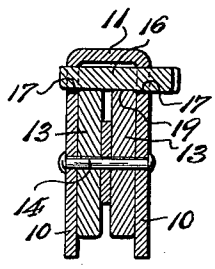


Fig. 4

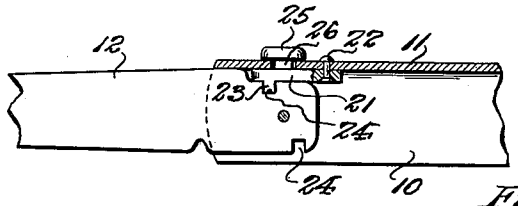


Fig. 5

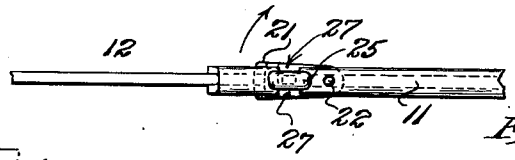


Fig. 6

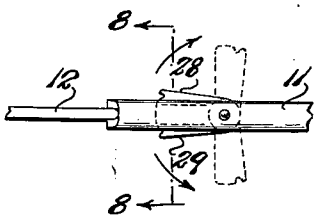


Fig. 7

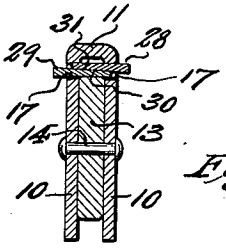


Fig. 8

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FOLDABLE POCKET TOOL

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3 Claims. (Cl. 30—161)

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This invention relates to improvements in pocket tools of the kind having a handle sheath to which one or more tool elements are pivotally connected so as to be optionally in-folded into the handle sheath or out-swung from the latter to an operative position for use; and this invention has reference, more particularly to improvements in manipulatable means for optionally locking the tool element or elements in either in-folded out of service relation to the handle sheath or in out-swung service relation thereto.

The invention has for an object to provide a pocket tool of the kind referred to, such e. g. as a pocket knife, wherein the handle sheath is of U-shape in cross-section, and within which at least one tool element, such e. g. as a knife blade, is pivoted subject to being swung into and out of said handle sheath; said handle sheath being provided with a simple and easily manipulated pivoted locking means which is cooperative with the butt end of the tool element, whereby to optionally secure the latter in either in-folded or out-swung position.

Other objects of the invention, not at this time more particularly enumerated, will be understood from the following detailed description of the same.

Illustrative embodiments of the present invention are shown in the accompanying drawings, in which:

Fig. 1 is a side elevational view of a pocket knife form of the tool of this invention showing, by full lines, a knife blade thereof as extended from the handle sheath and secured by the novel locking means in out-swung service position, and, by broken lines, in-folded and secured in out-of-service position within the handle sheath; Fig. 2 is a top edge elevational view of the same; and Fig. 3 is a cross-sectional view, taken on line 3—3 in Fig. 1, but drawn on an enlarged scale.

Fig. 4 is a view similar to that of Fig. 3, but showing a plurality of knife blades which are selectively movable into and out of the handle sheath.

Fig. 5 is a fragmentary longitudinal sectional view of a tool showing a modified form of the pivoted locking means, and Fig. 6 is a top edge elevational view of the tool of Fig. 5.

Fig. 7 is a fragmentary top edge view of a tool having another modified form of the pivoted locking means; and Fig. 8 is a cross-sectional view of the same, taken on line 8—8 in Fig. 7, but drawn on an enlarged scale.

Similar characters of reference are employed in the figures of the drawings, to indicate corresponding parts.

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The tool of this invention comprises a handle sheath which is of U-shape in cross-section, thus having spaced walls 10 connected at their top edges by a back wall 11. The handle sheath thus formed is preferably produced from a blank of sheet metal folded longitudinally upon itself into the desired U-shape, but may be otherwise made and of other material.

To the handle sheath is pivotally connected a tool element so arranged as to be swung into and out of the handle sheath. For purposes of illustration the tool element has been shown as comprising a knife blade 12, but it will be understood that many other forms or kinds of tool elements may be mounted in connection with the handle sheath, such e. g. as a screw driver blade, a can opening blade, a thread or feeler gauge blade, a manicure file, a hair comb, a button hook, etc.

The knife blade 12 terminates at its inner end in a butt portion 13 which is housed in an end portion of the handle sheath between the side walls 10 thereof, and is pivotally connected therewith by a transverse pivot pin 14 which extends through the butt portion 13 and said side walls 10.

Pivotally connected by a hinge pin 15 to the back wall 11 of the handle sheat his a laterally swingable locking member 16 which is disposed to lie beneath said back wall and intermediate the same and the butt portion 13 of the knife blade 12. At least one side wall 10 of the handle sheath is, and preferably both said side walls 10 are, provided with a longitudinal slot 17 to accommodate the locking member 16, and through one of which said locking member 16 can be swung out of the interior of the handle sheath. The locking member 16 is so shaped that at least one side thereof projects exteriorly of the handle sheath, when said locking member is swung into the latter to a normal knife blade butt portion engaging and securing position (as will be subsequently explained), and so that a free end portion of the locking member, thus projected, is accessible from the exterior of the handle sheath. Such exteriorly projected portion of the inswung locking member is provided at its free end with an indentation 18 which can be engaged by a finger-nail, when it is desired to manipulate the locking member so as to out-swing the same, and thus disengage it from the knife blade butt portion 13. The body of the locking member 16 is of wedge shape in transverse cross-section, thus optionally providing either an inclined plane under face 19 for opposition to and engagement with a side edge of the blade butt portion 13, or,

if desired, an inclined plane upper face or both upper and lower inclined faces.

When it is desired to release the in-folded knife blade 12 for out swinging movement to the operative open or extended relation to the handle sheath, the locking member 16 is engaged by a finger of the user and thereby out swung laterally from the interior of the handle sheath through a slot 17. Such outswinging of the lock member removes the same from the path of rotative movement of the knife blade butt portion 13, and consequently withdraws obstruction to such movement so that the knife blade can be swung out of the handle sheath to desired extended relation thereto. A blade ejector leaf spring 20 may be fixed within the handle sheaths (see Figs. 1 and 2) which, when the blade is released from engagement by the locking member 16, will function to automatically out swing said blade from the handle sheath interior. After the blade has been out swung to operative extended relation to the handle sheath (see Figs. 1 and 2) which, when back into the interior of the latter, thus interposing the body of said locking member between the back of the handle sheath and the opposed side edge of the blade butt portion 13. As the locking member is in-swung across the blade butt portion 13, the inclined plane under face 19 of the former will engage the opposed side edge of the latter with a strong wedging action and thrust, thus securely binding the blade butt portion against rotative movement, and thereby rigidly supporting the blade against collapse or displacement from its operative extended relation to the handle sheath. The wedged relation of the locking member to the blade butt portion also frictionally resists accidental displacement of the locking member from its operative relation to the blade.

It will be obvious, when it is desired to close the knife blade into the handle sheath, that the locking member 16 must be outswung so as to permit rotative movement of the blade butt portion 13. After the blade is folded into the handle sheath, the locking member 16 is returned to its in-swung holding position so as to engage the opposite side edge of the blade butt portion 13, which is then opposed thereto, and thus to firmly hold and secure the blade against displacement from such infolded relation to the handle sheath (see broken line representation of the blade shown in Fig. 1).

It will be understood that the handle sheath may be equipped with more than one blade. This is indicated in Fig. 4, wherein the butt portions 13 of two blades arranged side by side are shown, in which case the handle sheath is increased in width to accommodate the plurality of blades, and the locking member 16 is increased in width to engage the plurality of butt portions.

In Figs. 5 and 6 a modified form of laterally swingable locking means is shown. This modified arrangement comprises a locking member body 21 which is pivotally connected by a hinge pin 22 to the back wall of the handle sheath, and so as to lie intermediate said back wall and a butt portion 13 of a knife blade. Projecting from the underside of the locking member body 21 is an interlock lug 23 adapted, when the locking member body is in-swung to blade holding position, to enter and engage one or the other of interlock notches 24 which indent the side edges of a blade butt portion 13. The locking member body 21 may be formed similarly to the previously described locking member 16 so as to be subject to the mode of manipulation above described with respect to the latter. Alternatively, the locking member body, as shown in Figs. 5 and 6, is provided with an upstanding external finger piece 25 which is connected by a shank 26 to the upper face of said locking member body 21. Said finger piece overlies the outer surface of the top wall 11 of the handle sheath, and said top wall is cut away transversely to provide an opening or way 27 to permit outswinging movement therethrough of the finger piece shank 26, when the locking member is manipulated for out and in swinging movement relative to the handle sheath. It will also be understood that the external top finger piece arrangement may be optionally utilized in connection with the form of locking member 16 first described, as an alternative to the indented finger engageable end portion thereof.

Shown in Figs. 7 and 8 is another form of locking means for optionally holding a tool element in either infolded or outwardly extended relation to a handle sheath to which it is pivotally connected. This arrangement of locking means comprises a pair of superposed cooperative locking members 28 and 29 which are pivotally connected with the back wall 11 of the handle sheath, and respectively subject to outswinging movement in opposite directions through slots 17 provided in the side walls 10 of the handle sheath. Said locking members 28 and 29 are of complementary wedge shape in cross-section, with their meeting faces providing matching inclined plane surfaces 30 and 31. It will be obvious, when the locking members 28 and 29 are in swung to operative meeting relation over an underlying blade butt portion 13, that the same will, by their wedging action, be strongly thrust against the side edge of the blade butt portion which is opposed thereto, and thus will firmly secure the said butt portion and tool element against rotative movement, while at the same time said locking members will be frictionally retained against accidental out swinging movement and release from the engaged blade butt portion.

It will be understood that variations other than those above specified may be made without departing from the scope of this invention as defined in the following claims. It is, therefore, intended that all matter contained in the foregoing description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. A pocket or hand tool comprising a handle sheath of U-shape cross-section formed by spaced side walls and a connecting back wall, a tool element having a butt portion pivotally connected to and between the side walls of the handle sheath at an end of said sheath, whereby the tool element can be swung into and out of the sheath, a plate-like locking member pivotally connected by one end thereof to and beneath the back wall of the sheath to swing in a plane perpendicular to the plane of the side walls of the sheath, through openings provided in said side walls, across the sheath interior from one side thereof, said locking member being of an overall width greater than the transverse width of the handle sheath, said locking member tapering in thickness from its outer edge toward its inner edge, thus being of wedge shape in cross-section, said locking member, when inwardly

swung across the handle sheath, being adapted to wedge between the back wall of said sheath and the edge of the tool butt portion opposed thereto, whereby to firmly secure the tool element optionally in either out swung or in folded relation to the handle sheath, and said locking member having an external finger engageable means for manipulation thereof.

2. A pocket or hand tool comprising a handle sheath of U-shape cross-section formed by spaced side walls and a connecting back wall, at least one tool element having a butt portion pivotally connected to and between the side walls of the handle sheath at an end of said sheath, whereby the same can be swung into and out of the sheath, a pair of superposed plate-like locking members pivotally connected to and beneath the back wall of the sheath by a pivoting rivet common thereto, said locking members being adapted to be swung in planes perpendicular to the planes of the side walls of the sheath, through openings provided in said side walls, across the sheath interior respectively from opposite sides thereof, each locking member tapering in thickness from its outer side edge toward its inner side edge, whereby the same are of oppositely directed wedge shape in cross-section, said locking members when inwardly swung across the handle sheath into operative superposed relation, being adapted to wedge between the back wall of said sheath and the edge of a tool butt portion opposed thereto, whereby to firmly secure a tool element optionally in either out swung or in folded relation to the handle sheath, and each locking member having an external finger engageable means for manipulation thereof.

3. A pocket or hand tool comprising a handle sheath of U-shape cross-section formed by spaced

side walls and a connecting back wall, a tool element having a butt portion pivotally connected to and between the side walls of the handle sheath at an end of said sheath, whereby the tool element can be swung into and out of the sheath, a plate-like locking member pivotally connected by one end thereof to and beneath the back wall of the sheath to swing in a plane perpendicular to the plane of the side walls of the sheath, through openings provided in said said walls, across the sheath interior from one side thereof, said locking member being of an overall width greater than the transverse width of the handle sheath, said locking member, when inwardly swung across the handle sheath, being adapted to engage between the back wall of said sheath and the edge of the tool butt portion opposed thereto, whereby to firmly secure the tool element optionally in either out swung or in folded relation to the handle sheath, and said locking member having an external finger engageable means for manipulation thereof.

JOSEPH HOPTA.

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