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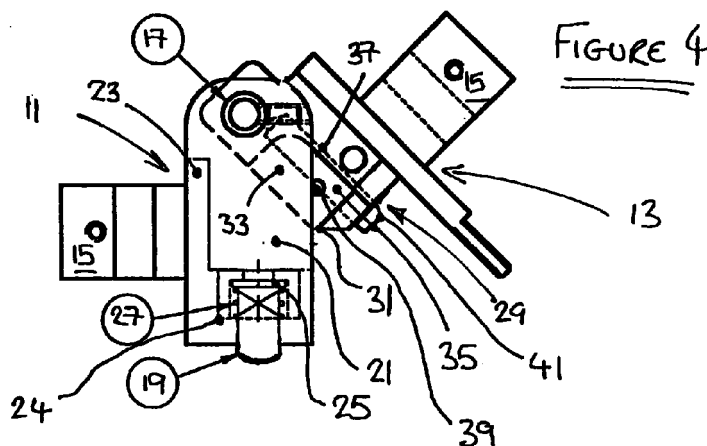
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(54) **Hinge mechanism for firearms**

(57) An embodiment provides a self-cleaning or clearing hinge mechanism 7 for firearms 1. The hinge 7 may be lockable in at least one predetermined position, and may comprise a self-tightening and/or adjusting lock mechanism 35, 41 operable to lock the hinge 7 in said at least one predetermined position.

A further embodiment provides a hinge mechanism 7 for firearms 1 comprising a self-tightening and/or adjusting lock mechanism 35, 41 operable to lock the hinge 7 in at least one predetermined position.



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Description

[0001] This invention relates to a hinge mechanism for firearms, and embodiments of the invention relate to firearms such as rifles incorporating such a mechanism.

[0002] It has previously been proposed to provide firearms, such as rifles, with a variety of different folding mechanisms to allow the firearm to be made shorter and more compact for carriage. For example, some rifles used for hunting, law enforcement or military purposes have been produced with a method of shortening the weapon by quick barrel removal ("take down"). Other firearms include mechanisms to allow the butt to be folded away or to allow the firearm to be quickly broken down into smaller components. Generally speaking, these previously proposed arrangements allow the firearm to be converted from a stowed position where the firearm is of reduced length (for example with the butt folded alongside the barrel of the firearm) to a firing position where the components of the firearm are arranged in a normal firing position (for example with the butt aligned with the barrel) and visa versa.

[0003] Several problems have been noted with respect to these previously proposed arrangements. For example, it has been noted that conventional folding mechanisms can quickly become fouled by dirt to such an extent that it is no longer possible to easily fold away and deploy the foldable butt of the firearm. Whilst this is only inconvenient, for the most part, for hunters and law enforcers, it can pose a serious threat for military personnel parachuting, for example, into hostile territory only to find that the butt of their firearm cannot be locked into a position where the firearm can be fired.

[0004] A further problem associated with these previously proposed firearms is that the lock mechanism of the hinge can be subject to wear throughout its life. Wear of the lock mechanism can cause the portions of the firearm either side of the lock mechanism to be moveable with respect to one another when the firearm is locked in the firing position. Movement of the firearm portions in this way can be extremely unsettling for the user of the firearm, and can seriously affect the accuracy of the weapon.

[0005] A further problem associated with these previously proposed arrangements is that the hinge mechanism can be difficult and awkward to operate, thus resulting in unacceptable delays in the assembly of the firearm from the stowed position to the firing position.

[0006] A further problem associated with these previously proposed firearms is that the hinge mechanisms, for example, are not easily disassemblable for repair, cleaning or component replacement for example.

[0007] It is an object of the invention to alleviate some or all of these or other problems associated with these and/or other previously proposed devices.

[0008] A first aspect of the invention provides a self-cleaning or clearing hinge mechanism for firearms. Preferably the hinge mechanism is lockable in at least

one predetermined position.

[0009] A further aspect of the invention provides a hinge mechanism for firearms that comprises a self-tightening and/or adjusting lock mechanism operable to lock the hinge in at least one predetermined position. Preferably the hinge mechanism is self-cleaning or clearing. The lock mechanism may include a tapered or conical or chamfered locking bolt.

[0010] A further aspect of the invention relates to a foldable firearm comprising a self-latching locking mechanism. A quick release mechanism may be provided to enable the firearm to be quickly converted from a firing configuration to a stowed configuration.

[0011] A further aspect of the invention relates to a quick release mechanism for a firearm. The firearm may be provided with a self latching locking mechanism.

[0012] A further aspect of the invention relates to a lockable hinge or self-locking hinge for firearms.

[0013] A further aspect of the invention provides a firearm incorporating any of the above mentioned arrangements. Preferably the hinge mechanism is provided towards the butt of the firearm. Preferably the firearm is a rifle. Preferably the hinge mechanism allows the butt of the firearm to be folded through 180°. Preferably the quick release mechanism allows conversion of the firearm at the press of a button. Preferably the hinge mechanism is easily disassemblable and adjustable.

[0014] An embodiment of the invention will now be described by way of example only with reference to the accompanying figures, in which:

Figure 1 is a plan view of a firearm in a firing position;

Figure 2 is a plan view of the firearm of Figure 1 in a stowed position;

Figure 3 is a plan view of a hinge mechanism of the firearm of Figure 1 in a locked firing position;

Figure 4 is a plan view of the mechanism of Figure 3 in an open position; and

Figure 5 is a plan view partly cut-away of a portion of the mechanism of Figure 3.

[0015] The following description relates to an embodiment incorporating the teachings of the invention in a folding stock (or butt) rifle, but it should be noted that the invention is not limited to such an arrangement as the teachings of the invention may be applied to other firearms or to other components of the firearm, such as the barrel for example.

[0016] As mentioned above, Figure 1 is a plan view of a firearm - which in this embodiment comprises a rifle 1 - in a locked firing position. The rifle 1 is composed of a stock portion 3 and a barrelled action 5 (herein referred to as a barrel portion). Interconnecting the stock and barrel portions 3, 5 is a hinge mechanism 7 - the construction of which will later be described. The hinge mechanism 7 allows the stock portion 3 and barrel portion 5 to be folded together and unfolded along

the line A--A shown.

[0017] Figure 2 is a plan view of the rifle 1 of Figure 1 in the stowed position with the stock portion 3 folded alongside the barrel portion 5. An external lock 9 (such as a pin and cooperating cup) is provided to keep the rifle 1 in the stowed position.

[0018] Figure 3 is a view of the hinge mechanism 7 that, in this embodiment, interconnects the stock portion 3 and the barrel portion 5. The hinge mechanism 7 comprises a female assembly 11 (attached to the stock) and a male assembly 13 (attached to the barrel portion) and each of these has a spigot 15 fittable into the stock or barrel portion, respectively, of the rifle 1. In the embodiment shown, the hinge mechanism is arranged for right-handed rifles where the stock portion 3 is to be folded to the left. For left-handed rifles the mechanism would simply be reversed. The female assembly 11 and male assembly 13 are connected to one another, and pivotable about one another, by virtue of a pivot pin 17 interconnecting the two assemblies. A quick release button 19 is provided that, when depressed, releases the hinge mechanism to allow the stock and barrel assemblies (and connected rifle components) to be pivoted about one another.

[0019] Figure 4 is a plan view of the hinge mechanism 7 in an open position showing the stock 11 and barrel assemblies 13. The female assembly 11 comprises an outer shell with an internal cavity 21 bounded by a protruding wall portion 23 which acts, in a manner to be described, as part of a self-cleaning mechanism. The button 19 has a cup 25 formed in one end thereof and is spring-mounted in a cavity 24 formed in an inner wall of the female assembly 11. Depressing the button causes the cup 25 to be moved, against the action of a spring 27, towards the internal cavity of the female assembly 11.

[0020] The male assembly 13 comprises a body portion 29 formed with a chamfered inner edge 31, and a recess 33 that acts in conjunction with the protruding wall portion 23 as the self-cleaning mechanism. A similar recess and protruding wall portion are formed on the underside of the barrel and stock assemblies but are hidden from view. A locking pin 35 is moveable against the action of a spring 34 into and out of a channel 37 (more clearly shown in Figure 5) formed in the male assembly 13. The pin 35 and spring 34 are retained within the channel 37 by a removable retaining pin 39. As shown, the locking pin 35 is formed with a chamfered or tapered or conical head 41 that is mateable with the cup 25 of the button 19 when the female assembly 11 is engaged with the male assembly 13. When the locking pin head 41 is engaged with the cup 25, the male assembly 13 is locked to the female assembly 11 and movement of the male assembly with respect to the female assembly is resisted. The locking pin head 41 is shaped so that, even after it has worn considerably, it still makes a secure fit with the cup and thus avoids problems associated with the butt and barrel being

moveable with respect to one another when the firearm is in the firing position.

[0021] As mentioned above, the recess 33 acts in conjunction with the protruding wall portion 23 as a self-cleaning mechanism. Should any foreign matter such as earth, for example, become trapped in the recess 33 of the male assembly 13, then a significant portion of that matter is swept from the recess 33 by the protruding wall portion 23 moving through the recess as the hinge mechanism is closed. In this way, at least a significant portion of any dirt or foreign material trapped in the hinge is removed on closure. This arrangement avoids problems associated with previously proposed devices where it can sometimes be difficult to convert the firearm to the firing position because of dirt trapped in the hinge.

[0022] Figure 5 is a plan view, partly cut away, of the male assembly 13. As shown, the locking pin 35 is spring mounted in the channel 37 and retained therein by the removable pin 41 which engages with a groove 43 formed in the locking pin. The groove 43 allows some movement of the locking pin 35, and reduces the likelihood of unwanted extraction of the pin 35 from the channel 37. The pin 41 is removable to allow the locking pin 35 to be replaced or for cleaning of the male assembly 13.

[0023] When the hinge mechanism 7 is moved from the position shown in Figure 4 to the position shown in Figure 3, the locking pin head 41 engages with an inner wall of the female assembly 11 surrounding the cavity 24 and is pushed against the action of the spring 34 back into the channel 37. As the assemblies 11, 13 move further towards the position shown in Figure 3 and when the locking pin 35 coincides with the cavity 27, the spring 34 drives the locking pin 35 into engagement with the cup 25 and the male assembly 13 is locked to the female assembly 11.

[0024] To release the two assemblies from one another it is first necessary to depress the button 19 against the action of the spring 25. Pushing the button towards the cavity 21 causes the locking pin to be depressed against the action of the spring 34 until the locking pin clears the surrounding walls of the cavity 24, whereupon the locking pin 35 can be forced out of engagement with the cup 25 by applying an appropriate force to the stock 3 and barrel 5 portions of the rifle either side of the hinge 7.

[0025] It can be seen therefore that the hinge mechanism herein described provides various advantages over previously proposed arrangements. In particular, it provides a secure lock between the stock and barrel portions of the rifle and thus alleviates problems associated with flexing of the rifle when in the firing position. Advantageously, the lock mechanism is releasable simply by pushing the button 19 and applying pressure to the stock and barrel of the rifle 1. The interaction of the protruding inner wall 23 and recess 33 alleviates problems associated with dirt contamination and the fact

that the pin has a shaped head alleviates problems associated with loosening of the lock mechanism after use. In addition, the locking pin 35 is easily removable for replacement or cleaning. Finally, the hinge mechanism described herein may advantageously be used in both left-handed and right-handed firearms.

[0026] It will be understood, of course, that aspects of the invention have been described herein by way of example only, and that modifications may be made without departing from the scope of the invention.

Claims

1. A self-cleaning or clearing hinge mechanism for firearms.
2. A hinge mechanism according to Claim 1, wherein the hinge is lockable in at least one predetermined position.
3. A hinge mechanism according to Claim 2, comprising a self-tightening and/or adjusting lock mechanism operable to lock the hinge in said at least one predetermined position.
4. A hinge mechanism for firearms comprising a self-tightening and/or adjusting lock mechanism operable to lock the hinge in at least one predetermined position.
5. A hinge mechanism according to Claim 4, wherein the hinge is self-cleaning or clearing.
6. A hinge mechanism according to Claim 4 or 5, wherein the self-tightening and/or adjusting lock mechanism includes a tapered or conical or chamfered locking bolt.
7. A hinge mechanism according to Claim 6, wherein the locking bolt comprises a resiliently biased bolt provided on a first hinge portion of said hinge, and a socket provided on a second hinge portion of said hinge, said bolt being engageable with said socket.
8. A hinge mechanism according to any of claims 2 to 7, wherein the lock mechanism is a self-latching locking mechanism.
9. A hinge mechanism according to any of claims 2 to 8, comprising a quick release mechanism enabling the firearm to be quickly converted from a firing configuration to a stowed configuration.
10. A hinge mechanism according to Claim 9, wherein the quick release mechanism allows conversion of the firearm from a firing configuration to a stowed configuration at the press of a button.
11. A hinge mechanism according to any preceding claim, comprising a first hinge portion and a second hinge portion connected to one another and movable to close the hinge, wherein one of said hinge portions is provided with a cleaning or clearing member operable to clean or clear at least a portion of a cavity formed in the other hinge portion upon closure of said hinge.
12. A hinge mechanism according to Claim 11, wherein said cleaning or clearing member sweeps through at least a portion of said cavity upon closure of said hinge.
13. A hinge mechanism according to Claim 11 or 12, wherein said cleaning or clearing member comprises an extended wall portion of one of said hinge portions.
14. A firearm comprising a hinge according to any preceding claim.
15. A firearm according to Claim 14, wherein the hinge mechanism is provided towards the butt of the firearm.
16. A firearm according to Claim 14 or 15, wherein the firearm is a rifle.
17. A firearm according to any of Claims 14 to 16, wherein the hinge mechanism allows the butt of the firearm to be folded through 180°.

