

Hand-held firearm with a slide-retraction lever

The invention relates to a hand-held firearm with a slide-retraction lever that comprises a first and a second handle for the retraction of the slide-retraction lever, which are arranged on the opposite sides of the weapon, and having a locking device that is coupled to the first handle in such a way that operating the first handle releases its lock to the weapon.

The position indications used in the following, such as "front," "rear," "side," etc., refer to a hand-held firearm in a normal, horizontal firing position, whereby the muzzle, and thus the firing direction of the weapon, points toward the front.

In semi-automatic hand-held firearms often a slide-retraction lever or locking lever is rigidly connected to the breech. This construction is still used today, especially in lower-cost semi-automatic rifles for small-caliber cartridges. Advantageously, the breech, if it does not close properly, can be pressed shut with the slide-retraction lever. However, it is a disadvantage that the rigid slide-retraction lever extends through the housing to the outside and thus must be able to move freely parallel to the weapon. When it collides with an obstacle then this may lead to a jamming, or if it hits a body part of the marksman he can be injured.

Even before the First World War reloading devices were built where the slide-retraction lever decouples from the breech after the retraction. The above disadvantage is thereby avoided, but also the mentioned advantage of the manual shutting of the breech.

Since the advent of the housing construction method in military rifles usually the fixed coupling of the breech with the slide-retraction lever is abandoned, and instead of this the slide-retraction lever is decoupled from the breech in an inserted state.

In reloading devices known from the state of the art the slide-retraction lever is in hand-held firearms attached either to the right side or the left side of the weapon. For example, in DE 101 22 345 C1 of the same applicant it involves a cocking lever that is attached to only one side and can be operated on one side, that prestresses the breech against the pressure of a closing spring and fixes it in various positions. For this, a longitudinal slit with a rigid clamping rail is present in the housing in which the cocking lever is inserted and can be rigidly clamped.

In DE 39 28 125 A1 of the same applicant, a reloading device is described with a slide-retraction lever that can be rotated to both sides. It is inserted in a slit that extends in the longitudinal direction in the housing outside on the weapon.

DE 19545774 C2, also from the same applicant, discloses a self-loading rifle with a, into the housing inserted, cocking lever that has a hand grip that stands away from the housing. The hand grip includes a nose that can be brought, for holding the cocking lever, spring-supported into in a form-fit engagement with a construction in the housing. By rotating back the hand grip during the sliding back of the cocking lever it can be released from the engagement. The cocking lever can hereby be operated always only on one side.

In class-specific hand-held firearms, such as the American M 16 A2, the slide-retraction lever has on its operating end a T-shaped hand grip and can be operated from both sides of the weapon. A handle is arranged only on one

side of the hand grip of the slide-retraction lever which is held pivoted on the hand grip and engages with a locking nose in a clearance of the weapon housing in order to block the movement of the slide-retraction lever with respect to the weapon housing. The locking nose lifts itself out of the clearance upon operation of the handle and thereby unlocks the slide-retraction lever.

These reloading devices, known from the state of the art, can be operated only either from the right or the left and the slide-retraction lever can thereby only unlock from one side. These slide-retraction levers have thereby the disadvantage that they are designed only for the use of the weapon either by a right-handed or a left-handed person. Especially in the military field two, for right-handed or left-handed persons, different weapon designs increase, in the storage, distribution, and use of the weapons, the logistical and administrative expenses. In addition, the production and acquisition costs of weapons designed for left-handed persons are higher, since these are usually associated with higher costs due to the smaller number of parts during the production.

In addition, in the case of military rifles, the boundary conditions that occur during use, such as pollution, ambient temperature, weapon temperature, among others, vary. A cartridge can thereby cant in the chamber when inserted and cause a jamming. The breech system then can no longer close properly. This can pose a significant danger to the operator. It is true that such jams are extremely rare, but a weapon should be free from any breakdown.

The invention is therefore based on the task to improve the operability of a class-specific weapon.

According to the invention this task is solved by the subject matter of the independent claim 1. According to it, in a weapon mentioned in the introduction, the locking device is also

coupled to the second handle in such a way that by operating the second handle their locking is unlatched independently of the operation of the first handle.

The handles of the slide-retraction lever are thus not only constructed on both sides, but can also always be operated from one side or the other side of the weapon in order to release the lock of the slide-retraction lever.

Such a weapon, which thus can be used universally by both right-handed and left-handed persons, saves, especially in the military field, time and costs, as well as in the procurement as well as in the management and distribution of weapons.

In addition, weapons constructed in this way reduce the danger to the weapon commander or persons in the surroundings. Due to the in such a way designed operator guide, operation failures, for example, by a crossing over to the other side of the weapon during the operation of a weapon designed for a right-handed person by a left-handed person or vice versa, are prevented. In addition, jamming can be corrected more easily.

The weapon basically includes all types of hand-held firearms with a slide-retraction lever such as automatic, semiautomatic, small caliber, large caliber, hand-held firearms, for example, machine guns, submachine guns, or rapid fire pistols, or the like.

In addition, in the case of a hand-held firearm the first and the second handle are preferably coupled to each other via a coupling mechanism. The first and the second handle are hereto preferably mounted hinged on the slide-retraction lever. The coupling mechanism includes in addition preferably a pin that is constructed on the first handle, and a, with this pin engaging, clearance that is constructed on the second handle, whereby the pin and the clearance

are designed and arranged in such a way that they couple the rotational movements of the two handles to each other. Alternatively, also a coupling of the handles each by means of a connection designed as a gear wheel. However, the arrangement of the handles must be such that the teeth of gear wheel have a slight offset, as only in this way an interlocking of the teeth is possible and thereby a desired leverage action as well as coupling of the two handles is achieved.

Furthermore, the pins have preferably a round head section and the clearance a rectangular profile. Alternatively, the head section can also be designed to be sphere-shaped, cone-shaped, or drop-shaped, and the profile can be constructed to be somewhat round or rounded. Especially preferably, however, the pins are thereby undercut.

In addition, the coupling mechanism of the hand-held firearm has preferably at least one spring that prestresses the handles in their rest positions. This spring can be one or more leaf, disk, or compression springs made from an elastomeric material or metal that is connected to the handles as one piece or multiple pieces. Preferably, this involves a separate compression spring.

In addition, the first and the second handle are preferably integrated into the slide-retraction lever of the hand-held firearm and each has preferably, on a section that rises towards the outside in the direction of the muzzle of the weapon, a handle area for their operation. In addition, the handles can be operated for the unlocking of the lock preferably in the pull direction of the slide-retraction lever. The handle areas alternatively can also be arranged laterally or backward, but an orientation to the front and operability in the direction of tension of the slide-retraction lever is ergonomically the most advantageous.

In addition, the locking device of the hand-held firearm includes preferably a with the first and a with the second handle

connected locking nose which each engage preferably with a clearance on the housing or the breech sleeve. Alternatively, the locking noses of the handles can also be brought into engagement for the locking with a clearance in the barrel or tube. A locking in the housing, however, has the advantage that the processing cost for the production of the clearances is lower. Of course, the noses can also be constructed on the housing or the barrel and the clearance on the handle.

Alternatively, a lock can be constructed only with a locking nose or locking point on one side in the housing or the breech sleeve, whereby in this case both handles are coupled to this one locking nose or point and must be operable independently from each other in order to release the lock.

Finally, the slide-retraction lever in the weapon is preferably movable inside a guide device in the longitudinal direction of the weapon. In addition, preferably one of the ends of the slide-retraction lever acts on the breech and the other end is coupled to the handle. Alternatively, the slide-retraction lever can be arranged on the weapon or outside the weapon, but it can then more easily be impeded or damaged or end up out of the guide.

The slide-retraction lever as well as the housing can be manufactured from, for example, thin sheet metal or plastic reinforced with glass-fiber.

When a simple blowback action is used, the slide-retraction lever preferably acts directly on it. Alternatively, in the case of a locked breech with a breech head and a breechblock support, it is preferred that the slide-retraction lever acts directly on the breechblock support.

The slide-retraction lever can thereby be connected directly, or via a connecting element, to the breech as well as the breechblock support. This connection can be rigid and form locking or force-closed and/or can be partially decoupled. However, preferably the breech or the breechblock support are acted upon indirectly and carried along by the slide-retraction lever during retraction.

The subject matter of the invention is further explained with reference to the attached, schematic drawing. These show

- Fig. 1 a perspective partial view, slightly oblique, from above of some main components of a weapon according to the invention;
- Fig. 2 a top view of the locking mechanism of the weapon of fig. 1 in the locked position;
- Fig. 3 a top view of the locking mechanism in the unlocked position of the weapon of fig. 1;
- Fig. 4a, b the slide-retraction lever of the weapon of fig. 1, once in cross section and once in top view;
- Fig. 5 a side view of the slide-retraction lever of the weapon of fig. 1; and
- Fig. 6a, b a perspective oblique view and a top view of the slide-retraction lever of fig. 1 in the guide device.

The invention will be described in the following with the aid of a schematic representation of a semiautomatic rifle, but this is not to be considered as limiting. As already mentioned, the invention in general relates to the, at the beginning mentioned, weapons with a continuous loading system.

According to fig. 1, the semiautomatic rifle comprises, among others, a housing 2, a tube 4, a breech system 6, a shaft 8, a trigger 10, and a frame 12. All other parts of the semiautomatic rifle, such as the trigger mechanism, etc., are not described in detail in the following since they are self-evident for the average professional. Thus, for example, the cartridge chamber is located at the rear end of the tube 4, and is locked by the breech system 6 that can move back and forth inside the housing 2. The breech system 6 can consist of two components, thus it can consist of a breech head 16 and a breechblock support 18. The breech head 16 has thereby on its front surface, thus on the side that faces the muzzle, a recess for the accommodation of a cartridge base into which an ejector leads. An extractor is located on one outside of the recess that engages in the base edge of a cartridge and supports the ejection of the cartridge case from the cartridge chamber after a shot.

In addition, at the rear end of the housing 2 a slide-retraction lever 22 is arranged centered above the tube 4, which protrudes towards the rear, beyond the shaft 8, with a T-shaped hand grip 24 out of the housing 2. Two handles 26, 28 are arranged on the hand grip 24 on both sides of the weapon for the unlocking of the slide-retraction lever 22. The handles 26, 28 each include corresponding handling areas 52 a and 52 b and can move relative to the hand grip 24, whereby, for the unlocking of the handles 26, 28, the respective handling areas 52 a and 52 b can be pressed into the hand grip 24. The handling areas 52 a and 52 b have a ribbed surface to, for example, facilitate the operation with gloves. In addition, respective round clearances are present inside the handles 26, 28 in order to reduce their weight.

The hand grip 24 is manufactured as one-piece and has over its height centered milled out lateral slits, which

partially merge into each other in the inside. The handles 26, 28 are inserted into these and each is fixed with an, into a bore inserted, bolt 36 a and b. The latter extends perpendicular to the handles 26, 28 and serves as their rotation axis. In a transversal bore inside the hand grip, that extends between the sections of the lateral slits that do not merge into each other, a spring 30 is inserted that prestresses both handles 26, 28 against each other in their rest positions. They are in their rest position in fig. 1.

A coupling mechanism between the two handles 26, 28 includes a pin 32 constructed on the first handle 26 and a, with this pin 32 engaging, on the second handle 28 arranged and approximately complementary to the pin 32 constructed, clearance 34. The pin 32 and the clearance 34 are in addition constructed and arranged in such a way that they couple the rotational motions of both the handles 26, 28 to each other. The coupling thereby takes place by means of the round head section of the pin 32 that rests on the rectangular profile of the clearance 34. Upon operating one or the other handle 26, 28, the respective other handle 26, 28 is moved along so that both handles 26, 28 always rotate in the same direction of action and against the pressure of the spring 30 around their rotation axes 36 a and b.

In addition, a locking nose 38 a and b is coupled to each of the two handles 26, 28 which each engage with a clearance 40 a and b in the housing 2. The above-described compression spring 30 thereby acts in such a way on the handles 26, 28, that the locking noses 38 a and b engage in the rest position of the handles 26, 28 in the clearances 40 a and b and are released from it upon operation of the handles 26, 28 (cf., fig. 3).

The locking noses 38 a and b are engaged with the clearances 40 a and b in fig. 1 and the

slide-retraction lever is locked with respect to the weapon. the above-described coupling mechanism, the locking is always unlocked, by operation of one or the other handle 26, 28, independently of the other handle 26, 28, from housing 2 and the slide-retraction lever 22 is thus released. The operation of the handles 26, 28 thereby takes place in the direction of tension of the slide-retraction lever 22, thus in the longitudinal direction of the weapon towards the rear. By operating only one arbitrary (or also both) handle 26, 28, then both locking noses 38 a and b are released from the clearances 40 a and b.

In rest position, shown in fig. 1, the hand grip of the slide-retraction lever 22 rests on a bearing surface of housing 2. The actual retraction takes place, according to the in the above described unlocking of the slide-retraction lever 22, by withdrawal of the slide-retraction lever 22 on the hand grip 24 in the longitudinal direction of the weapon up to the shaft 8 (cf., fig. 3). The slide-retraction lever 22 thereby glides in a guide device 44 with the same size in the housing 6 and is guided over two, on both sides on the slide-retraction lever 22 arranged, horizontally oriented guide noses 56 that each are in engagement with a guide transversal groove inside the guide device 44 (see figs. 6a and 6b).

One, from the front end of the slide-retraction lever 22 vertically down protruding, nose 60 pushes from behind a pusher 62 onto the breech 6, which thus carries it along during the retraction and releases it during the forward travel of the breech 6. The nose 60 has a bore 62 that extends in the longitudinal direction of the weapon. Through it a (not shown) gas extraction rod extends that, after a shot has been fired, acts on the breech 6 in such a way that it is moved to the rear in order to initiate the reloading process.

The semicircular clearance 58 on the front end of the guide device 44 serves as a movement area for the control bolt during the locking of the breech 6.

To remove the slide-retraction lever 22 from the guide device 44, the breech 6 is pulled to the rear and rotated downwards. The access to the slide-retraction lever 22 is thereby enabled. The latter is pulled back until its guide noses 56 arrive in the clearances 54 that are dimensioned in such a way that the guide noses 54 are released from the guide grooves and as a result the slide-retraction lever 22 can be removed downwards from the weapon, for example, for cleaning purposes.

The slide-retraction lever 22 is over its length up to the nose 60 equipped with a central longitudinal slit 50, inside which the breechblock support 18 with the gas rod can move back and forth. During the retraction of the slide-retraction lever 22, the nose 60 carries the breechblock carrier 18 along against the spring pressure of a recoil spring (not shown), and thus brings it into its clamped position. After the retraction, the slide-retraction lever 22 is brought again back into its initial position in the housing 2 and there locked, whereas the breech remains in its clamped position.

The slide-retraction lever 22 moves during the retraction the breech 6 inside the guide device 44 to such an extent that, in the case of a closed bolt position weapon, the breech 6 guides a cartridge into the cartridge chamber and closes or locks the breech 6 or, in the case of a open bolt position weapon, moves the breech 6 back until it is caught by the trigger mechanism behind the cartridge feed.

In the case of jamming the weapon commander can pull back the slide-retraction lever 22 as described above so that the canted cartridges should be ejected and the weapon is again reloaded.

Fig. 2 shows a top view of the handles 26, 28 of the slide-retraction lever 22 of fig. 1 in the locked position. The locking noses 38 a and b are thereby each engaged with the clearances 40 a and b and the spring 30 is in its relaxed position. Fig. 3 shows the handles 26, 28 in their unlocked position, whereby the slide-retraction lever 22 already has been pulled towards the rear partly out of the housing 2. Figs. 4a and b show a top view and a cross sectional view of the slide-retraction lever 22 of fig. 1, with and without the upper part of the hand grip 24. Fig. 5 shows the slide-retraction lever 22 of fig. 1 in a side view.

Patent claims

1. Hand-held firearm with
 - a slide-retraction lever (22) that has a first and second handle (26; 28) for the retraction of the slide-retraction lever (22), that are arranged on the opposite sides of the weapon; and
 - a locking device (38; 40) that is coupled to the first handle (26; 28) in such a way that by operating the first handle (26; 28) its lock with the weapon is released,characterized by that
 - the locking device (38; 40) is also coupled to the second handle (26, 28) in such a way that by operating the second handle (26; 28) its lock with the weapon is released, independently of the operation of the first handle (26; 28).
2. Hand-held firearm according to claim 1, in which the first and second handle (26; 28) are directly coupled to each other.
3. Hand-held firearm according to claim 2, in which the first and second handle (26; 28) are hinged on the slide-retraction lever (22) and the coupling mechanism has a, on the first handle constructed, pin (32) and a, with this pin (32) engaging, on the second handle constructed clearance (34), whereby the pin (32) and the clearance (34) are constructed and arranged in such a way that they couple the rotation movements of the two handles (26; 28) to each other.

4. Hand-held firearm according to claim 3, in which the pin (32) has a round head section and the clearance (34) have a rectangular profile.
5. Hand-held firearm according to one of the claims 2 to 4, in which the coupling mechanism in addition has at least one spring (30) which prestresses the handles (26; 28) in their rest positions.
6. Hand-held firearm according to one of the claims 3 to 5, in which the first and second handle (26; 28) are integrated into the slide-retraction lever (22) and have each a, on a section protruding towards the outside in the direction of the muzzle of the weapon, handling area (52 a; b) for their operation.
7. Hand-held firearm according to one of the preceding claims, in which the locking device has a locking nose (38 a; b) that is coupled to a first and to a second handle (26; 28), which each engage with a clearance (40 a; b) on the housing (2) or the breech sleeve (2).
8. Hand-held firearm according to one of the preceding claims, in which the handles (26; 28) for releasing the lock can be operated in the direction of tension of the slide-retraction lever (22).
9. Hand-held firearm according to one of the preceding claims, in which the slide-retraction lever (22) in the weapon can move inside a guide device (44) in the longitudinal direction of the weapon and in which one end (46) of the slide-retraction lever (22) acts on the breech (6) and the other end (48) [Tr.- original reads: (4B)] is coupled to the handles (26; 28).