- Preserving the cease-firing mechanism with release lever whether this is in automatic-fire or semiautomatic-fire mode in order to limit wear on the stop sear and maintain the same level of reliability and safety throughout the service life of the product.
- And in addition, all of these operations need to be accomplished by means of a rotary fire selector, namely a fire selector similar to that of a conventional gun.

The objective of these requirements is to allow a machine gun to have control ergonomics comparable with those of a gun without compromising its supporting capabilities.

Summary

[0022a] In a first aspect, the present disclosure refers to a safety device for a firearm allowing to prevent a shot from being fired, without blocking a re-cocking function, said safety device comprising a stop able to be moved between a stopping position immobilizing moving parts of the firearm in a rearward position and a release position allowing said moving parts to move in both rearward and forward directions, said safety device comprising a safety element able to move between a position of immobilizing the stop in the stopping position and a position of releasing the stop, said safety element bearing against an immobile part of the firearm, and said safety element being able to be moved toward the position of releasing the stop via a rearward movement of the moving parts.

[0023] In an example, the present disclosure relates to a safety device for a firearm making it possible to prevent a shot from being fired, without blocking the re-cocking function, and which can preferably be engaged whatever the condition of the weapon, said weapon comprising a stop able to be moved between a stopping position immobilizing the moving parts of the weapon in a rearward position and a release position allowing said moving parts to move in both directions, said safety device comprising a safety element able to move between a position of immobilizing the stop in the stopping position and a position of releasing the stop, said safety element bearing against an immobile part of the weapon, and said safety element being able to be moved toward the position of releasing the stop via a rearward movement of the moving parts.

[0024] In the present disclosure, what is meant by the moving parts is all of the parts set in motion by the weapon reload cycle. This is, for example, an assembly comprising a slide in which a bolt moves, the slide being able to be attached to a gas recoil piston. It may also more simply relate to a breech in the case of a non-locked breech.

[0025] According to preferred examples, the safety device according to the disclosure comprises a suitable combination of at least one of the following features:

- the lifting of the stop is commanded by a release lever pivoting about a pivot pin provided on a front part of the stop and held by a hooked pawl to a trigger blade or a rocker that can be connected to or disconnected from the trigger blade upon release of the trigger blade or disconnection of the rocker until such point as the moving parts move toward the rear of the weapon;
- the safety element is placed in the path of the stop by an elastic return element;
- the release of the return movement of the safety element under the stop is performed before the raising of the stop in each sear notch of the moving parts;

- the advance of the release of the return movement of the safety element under the stop on the raising of the stop is obtained by longitudinal offset between the rack formed on the sliding surfaces of the moving parts acting on the safety element, and the rack formed by the sear notches of the moving parts;
- the advance on the release of the return movement of the safety element under the stop on the raising of the stop is obtained by a longitudinal offset between the surface of the safety element and the sear notch of the stop (what is meant by a sear notch, all the surfaces underneath the moving parts and against which the stop bears in order to stop the moving parts);
- the advance on the release of the return movement of the safety element under the stop on the raising of the stop is obtained by having the movement of the safety element toward the position of releasing the stop, and the recoil movement of the moving parts being in opposite direction;
- the movement of the safety element toward the position of releasing the stop via the recoil movement of the moving parts is obtained by means of an intermediate lever or an intermediate wheel;
- the safety element pivots about a pivot pin fixed in the weapon;
- the safety element is retracted by the moving parts by collaboration between the sliding surfaces of the moving parts and the sliding surface of safety element;
- the safety element slides in a direction orthogonal to the movement of the stop.

[0026] A second aspect of the present disclosure relates to a firing mechanism incorporating the firearm safety device according to the first aspect.

[0027] Advantageously, the firing mechanism of the present disclosure comprises a semiautomatic-fire function which is obtained by a mechanism further comprising a rocker actuating the stop, and a trigger blade connected to the rocker by a disconnector able either to ensure mechanical coupling between the trigger blade and the rocker, or to disconnect said mechanical coupling between the trigger blade and the rocker, said disconnector being arranged in such a way as to pivot the rocker from the firing position to the rest position, so as to prevent the next shot from being let off when the trigger blade is kept in the firing position.

[0028] As a preference, the function of selecting the automatic-fire, semiautomatic-fire function and the function of selecting the safety function are performed by the same control for the operator.

[0029] Advantageously, the control mechanism consists of a rotary lever actuating a slider able to move in translation and allowing activation or deactivation of the functions associated with

semiautomatic fire and safety, so that three positions of the lever correspond to a safety position, to a semiautomatic-fire position, and to an automatic-fire position.

[0030] Advantageously, the slider comprises a safety control slot in which there moves a safety control lug fixed to the safety element, the shape of which allows the permanent positioning of the safety element in the position of releasing the stop when the fire selector is in the semiautomatic or automatic position, and allows the movement of the safety element between the position of immobilizing the stop and the position of releasing the stop when the selector is in the safety position.

[0031] As a preference, the shape of the slider immobilizes the trigger blade when the safety is on and releases it when the fire selector is in the semiautomatic or automatic position.

[0032] Advantageously, the various slots in the slider comprise notches in which the various lugs become lodged when the selector is in a selection position, so as to prevent the selector from being able to find a position of stable equilibrium between two positions, rendering the weapon status poorly defined.

[0033] Finally, in an example, the present disclosure also relates to an open-bolt firearm comprising a firing mechanism integrating the firearm safety device according to the first aspect.

Description of the figures

[0034] Figure 1 shows an exploded view of one example of a firing device according to the invention.

[0035] Figures 2a to 2d depict various cross sections through an example of a mechanism of the invention, with the various components assembled, the moving parts being positioned in the rearward position, and the safety being on.

[0036] Figure 2e depicts a perspective view of the example of a mechanism of figures 2a to 2d (in the safe position).

[0037] Figure 3 depicts a cross section through a device according to the invention, with the selector in the semiautomatic position.

[0038] Figure 4 depicts a cross section through the device of figure 3 in which the slider is no longer visible, with the trigger blade pressed, and the moving parts moving forward.

[0039] Figure 5 depicts the same cross section as figure 4, after the disconnector has disengaged.

[0040] Figure 6 shows a cross section of the device of figure 2, with the slider visible, the selector in the automatic position and weapon at rest.

Claims

1. A safety device for a firearm allowing to prevent a shot from being fired, without blocking a re-cocking function, said safety device comprising a stop able to be moved between a stopping position immobilizing moving parts of the firearm in a rearward position and a release position allowing said moving parts to move in both rearward and forward directions, said safety device comprising a safety element able to move between a position of immobilizing the stop in the stopping position and a position of releasing the stop, said safety element bearing against an immobile part of the firearm, and said safety element being able to be moved toward the position of releasing the stop via a rearward movement of the moving parts.
2. The safety device for a firearm as claimed in claim 1, wherein a lifting of the stop is commanded by a release lever pivoting about a pivot pin provided on the stop and held by a hooked pawl to a trigger blade or a rocker having a connected or a disconnected position from the trigger blade upon release of the trigger blade or disconnection of the rocker until such point as the moving parts moved toward a rear of the firearm.
3. The safety device for a firearm as claimed in claims 1 or 2, wherein the safety element is placed in a path of the stop by an elastic return element.
4. The safety device for a firearm as claimed in claim 3, wherein the release of the return movement of the safety element under the stop is performed before a raising of the stop in each sear notch of the moving parts.
5. The safety device for a firearm as claimed in claim 4, wherein an advance of the release of the return movement of the safety element under the stop on the raising of the stop is obtained by longitudinal offset between a rack formed on the sliding surfaces of the moving parts acting on the safety element, and a rack formed by sear notches of the moving parts.
6. The safety device for a firearm as claimed in claim 5, wherein the advance on the release of the return movement of the safety element under the stop on the raising of the stop is obtained by a longitudinal offset between a surface of the safety element and the sear notch of the stop.
7. The safety device for a firearm as claimed in claim 6, wherein the advance on the release of the return movement of the safety element under the stop on the raising of the stop is obtained by having the movement of the safety element toward the position of

releasing the stop, and a recoil movement of the moving parts being in opposite directions.

8. The safety device for a firearm as claimed in claim 7, wherein the movement of the safety element toward the position of releasing the stop via the recoil movement of the moving parts is obtained by means of an intermediate lever or an intermediate wheel.
9. The safety device for a firearm as claimed in one of the preceding claims, wherein the safety element pivots about a pivot pin fixed in the firearm.
10. Safety device for a firearm as claimed in claims 7 and 9, wherein the safety element is retracted by the moving parts by collaboration between the sliding surfaces of the breech and the sliding surface of the safety element.
11. Safety device for a firearm as claimed in claim 1, wherein the safety element slides in a direction orthogonal to the movement of the stop.
12. A firing mechanism incorporating the firearm safety device as claimed in one of the preceding claims.
13. The firing mechanism as claimed in claim 12, wherein a semiautomatic-fire function is obtained by a mechanism further comprising a rocker actuating the stop, a release lever holding the stop in the release position at a start and an end of firing, and a trigger blade connected to the rocker by a disconnector able either to ensure mechanical coupling between the trigger blade and the rocker, or to disconnect said mechanical coupling between the trigger blade and the rocker, said disconnector being arranged in such a way as to pivot the rocker from a firing position to a rest position, so as to prevent a next shot from being let off when the trigger blade is kept in the firing position.
14. The firing mechanism as claimed in claim 13, wherein a function of selecting an automatic-fire, semiautomatic-fire function and the function of selecting a safety function are performed by a same control for an operator.
15. The firing mechanism as claimed in claim 14, wherein the control mechanism consists of a rotary lever actuating a slider able to move in translation and allowing activation or deactivation of the functions associated with semiautomatic fire and safety, so that three positions of the lever correspond to a safety position, to a semiautomatic-fire position, and to an automatic-fire position.
16. The firing mechanism as claimed in claim 15, wherein the slider comprises a safety control slot in which there moves a safety control lug fixed to the safety element, the shape of which allows a permanent positioning of the safety element in the position of releasing the stop when a fire selector is in the semiautomatic or automatic position,

and allows the movement of the safety element between the position of immobilizing the stop and the position of releasing the stop when the selector is in the safety position.

17. The firing mechanism as claimed in claim 16, wherein the shape of the slider immobilizes the trigger blade when a safety is on and releases it when the fire selector is in the semiautomatic or automatic position.