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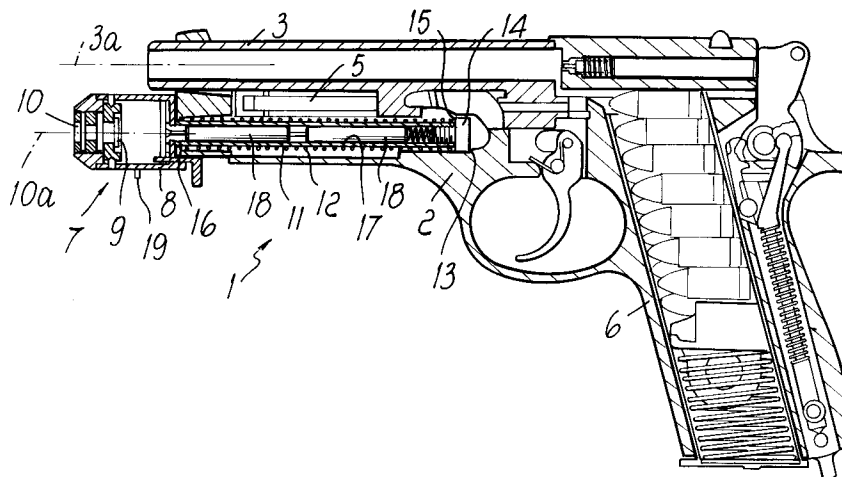
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I-20123 Milano (IT)(54) **Firearm with a laser-beam aiming device.**

(57) Automatic or semiautomatic firearm, such as a pistol, rifle or the like, with a laser-beam aiming device. The firearm (1) comprises: a frame (2) which slideably supports, along a sliding direction substantially parallel to the axis (3a) of the firearm barrel (3), a slide/breech-block, or breech-block; an automatic re-cocking device for the automatic movement of the slide/breech-block, or breech-block, with respect to

the frame (2) along the sliding direction upon firing and for its return into the initial position. The firearm has a laser-beam aiming device (7) which comprises a container (8) accommodating a laser-beam source (9) and connected to a support (11) associated with the frame (2) of the firearm (1). This support, connected to the container, is constituted by an element (11) of the firearm re-cocking device.

*Fig. 2***EP 0 618 422 A1**

The present invention relates to an automatic or semiautomatic firearm, such as a pistol, rifle or the like, with a laser-beam aiming device.

Automatic or semiautomatic firearms, such as for example pistols or rifles, are known which have a laser-beam aiming device allowing to obtain greater firing precision.

These aiming devices generally comprise a laser beam source constituted by a special diode arranged inside a block fixed to the body or frame of the firearm. Electric power is supplied to the diode which emits the laser beam by means of batteries or accumulators arranged inside the block itself or in appropriate containers connected to the diode by means of a wire.

Emission of the laser beam, during the aiming of the firearm, allows its user to see a bright dot on the target which is very close to the point which will be hit by the bullet after firing, allowing the user of the firearm to rapidly correct his aim and, at the same time, performing a deterrent action against the person on which the firearm is trained.

In currently commercially available firearms, the block with the laser beam source is usually provided with a contoured support fixed, by means of screws or fixing straps, to the frame of the firearm, generally below the barrel.

Although the presence of a laser-beam aiming device on firearms has been appreciated thanks to its undisputed advantages in terms of precision and effectiveness, it has also created some problems which so far have not been solved.

More particularly, the block containing the laser-beam source, once applied to the firearm, unavoidably alters its contour and also significantly changes its weight distribution, thus altering its balance.

Alteration of the contour of the firearm is a significant drawback, particularly in the case of pistols generally meant to be stored in holsters which are shaped according to the contour of the firearm without the laser-beam aiming device. Due to this fact, pistols currently commercially available with laser-beam aiming devices do not fit the holsters meant for them and force the use of specifically modified holsters.

As regards the change in the balance of the firearm, in currently commercially available firearms provided with laser-beam aiming devices this can be ascribed to a large extent to the position in which the block with the laser-beam source is fixed and to the weight of the block and of the possible support which fixes it to the firearm frame.

The aim of the present invention is to solve the problems described above by providing an automatic or semiautomatic firearm, such as for example a pistol or a rifle, with a laser-beam aiming device which is integrated with the firearm, altering

its contour and weight significantly less than currently commercially available laser-beam aiming devices.

Another object of the present invention is to provide a firearm wherein the laser-beam aiming device can be in a position extremely close to the barrel, so as to achieve high precision in firearm aiming.

Another object of the invention is to provide a laser-beam aiming device which can be mounted as an accessory on a wide range of currently commercially available firearms without requiring a particular pre-configuration of the firearm.

With these and other objects in view, there is provided, according to the present invention, an automatic or semiautomatic firearm, such as a pistol, rifle or the like, with a laser-beam aiming device, which comprises: a frame which slideably supports, along a sliding direction substantially parallel to the axis of the firearm barrel, a slide/breech-block, or breech-block; an automatic re-cocking device for the automatic movement of said slide/breech-block, or breech-block, with respect to said frame along said sliding direction upon firing and for its return into the initial position; a laser-beam aiming device being furthermore provided which comprises a container accommodating a laser-beam source and connected to a support associated with said frame, said support connected to said container being constituted by an element of said firearm re-cocking device.

Further characteristics and advantages of the present invention will become apparent from the following description of some preferred but not exclusive embodiments thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a lateral elevation view of a pistol with a laser-beam aiming device according to the invention, in a first embodiment;

figure 2 is an enlarged sectional view of the same pistol as in figure 1, taken along a longitudinal median plane;

figure 3 is an enlarged sectional detail view of a pistol with a laser-beam aiming device according to the invention, in a second embodiment; and

figure 4 is an enlarged and sectional detail view of a pistol with laser-beam aiming device according to the invention, in a third embodiment.

With reference to figures 1 and 2, the firearm according to the present invention, constituted by a semiautomatic pistol, generally designated by the reference numeral 1, in the illustrated embodiment, comprises in a per se known manner a frame 2 which slideably supports a slide/breech-block 4 along a direction substantially parallel to the axis 3a of the barrel 3.

The slide/breech-block 4 supports the barrel 3 and can move, due to the recoil of the firearm or to the pressure of the gases produced by the explosion of the cartridge, along guides 5 parallel to the axis 3a and formed by the frame 2, toward the rear end of the firearm, i.e. the end of the firearm which has the stock or butt 6.

In practice, the frame 2, the slide/breech-block 4 and the various firing elements are the same as in a conventional pistol; their detailed description is omitted, since they are known elements.

The pistol 1 is provided with a laser-beam aiming device, generally designated by the reference numeral 7, which comprises a container 8 inside which a laser beam source 9, constituted for example by a known diode, is accommodated. The container 8 has, on its front end, a hole 10 the axis 10a of which is substantially parallel to the axis 3a.

According to the present invention, the container 8 is connected to an element of the re-cocking device of the pistol.

Preferably, the container 8 is connected to the recoil spring guide 11 of the re-cocking device.

More particularly, the re-cocking device of the pistol comprises, in a known manner, a helical spring 12 arranged so that its axis is parallel to the axis 3a of the barrel 3 and fitted around a recoil spring guide 11.

The recoil spring guide 11 rests with one of its ends, toward the rear end of the firearm, against a shoulder 13 formed by the frame 2, and this end of the recoil spring guide 11 has an expansion 14 forming a shoulder 15 for an end of the spring 12.

The other end of the recoil spring guide 11 protrudes from the front end of the firearm, slidably passing through a passage 16 formed in the front end of the slide/breech-block 4 below the barrel 3. Said end of the recoil spring guide 11 that protrudes from the front end of the firearm is rigidly connected to the container 8 so as to support it.

In the embodiment illustrated in figure 1, the hole 10 is arranged coaxially to the recoil spring guide 11.

Advantageously, as illustrated, the recoil spring guide 11 can be hollow, so as to form an internal seat 17 for the batteries or accumulators 18 required to power the laser beam source 9.

A switch 19 is furthermore provided on the container 8 to activate or deactivate the laser beam source 9.

The laser-beam aiming device can be supplied together with the pistol or separately as an accessory. In the latter case, the device is constituted by the container 8, rigidly connected to a support made in the form of a recoil spring guide 11 of a known pistol, with the possible difference that it is hollow to contain the power supplies of the laser beam source 9 located in the container 8.

Conveniently, the expansion 14 of the recoil spring guide 11 is coupled by screwing to the remaining part of said recoil spring guide 11 so as to allow replacement of the batteries or accumulators 18 and correct mounting of the spring 12 around the recoil spring guide 11.

It should be noted that in the embodiment illustrated in figures 1 and 2 the laser-beam aiming device has, as a whole, a minimal bulk which alters only to a minimal extent both the contour and the weight distribution of the firearm. This fact allows to use the holsters usually provided for a pistol not equipped with the aiming device, and facilitates the correct placement of the firearm during its use.

Figure 3 illustrates a second embodiment of the firearm, designated by the reference numeral 20, with a laser-beam aiming device.

In this case, too, the support 31 of the container 28, accommodating the laser beam source 29, is made in the form of the recoil spring guide of the re-cocking device of the pistol.

Differently from the first embodiment, illustrated in figures 1 and 2, the recoil spring guide 31 is not hollow, and the batteries or accumulators 38 are accommodated in the container 28 below the source 29. The same reference numerals have been kept for the other elements of the firearm and of the laser-beam aiming device, which are unchanged with respect to figures 1 and 2.

Figure 4 illustrates a third embodiment of the firearm, designated by the reference numeral 40, with a laser-beam aiming device.

In this case, too, the laser-beam aiming device is composed of a container 48 accommodating the laser beam source and fixed to the end of a support 51 which is made in the form of the recoil spring guide of the re-cocking device of the pistol.

Differently from the previously described embodiments, in this embodiment the hole 50, having an axis 50a, from which the laser beam exits, instead of being coaxial to the recoil spring guide 51, is spaced below said guide 51 and is parallel thereto.

The batteries or accumulators 58 are accommodated, as in the embodiment illustrated in figure 3, directly in the container 48.

A switch for activating and deactivating the laser beam source is provided on the containers 28 and 48 as well.

Although the embodiments illustrated in figures 3 and 4 have a laser-beam aiming device which is bigger than the one shown in figures 1 and 2, since the support of these aiming devices is provided as a part of the re-cocking device of the pistol, there is in any case a reduction in bulk and weight with respect to known laser-beam aiming devices.

In practice it has been observed that the firearm with the laser-beam aiming device according

to the present invention fully achieves the intended aim, since by virtue of the fact that part of the laser-beam aiming device is formed as an integral part of the firearm, alteration of the contour and weight distribution of the firearm is limited.

A further advantage is that it is possible to mount the laser-beam aiming device according to the invention very easily and quickly on firearms already commercially available.

Although the basic concept of the invention has been described and illustrated with reference to a pistol, it may nonetheless be adopted for rifles or similar firearms as well.

The firearm with the laser-beam aiming device thus conceived is susceptible to numerous modifications and variations, all of which are within the scope of the inventive concept; all the details may furthermore be replaced with other technically equivalent elements.

In practice, the materials employed, as well as the dimensions, may be any according to the requirements and the state of the art.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

Claims

1. Automatic or semiautomatic firearm, such as a pistol, rifle or the like, with a laser-beam aiming device, which comprises: a frame (2) which slideably supports, along a sliding direction substantially parallel to the axis (3a) of the firearm barrel (3), a slide/breech-block (4), or breech-block; an automatic re-cocking device for the automatic movement of said slide/breech-block (4), or breech-block, with respect to said frame (2) along said sliding direction upon firing and for its return into the initial position; a laser-beam aiming device (7) being furthermore provided which comprises a container (8) accommodating a laser-beam source (9) and connected to a support (11) associated with said frame (2), characterized in that said support connected to said container is constituted by an element (11) of said firearm re-cocking device.
2. Firearm according to claim 1, characterized in that said re-cocking device comprises a helical spring (12) wound around a recoil spring guide (11) arranged substantially parallel to the axis (3a) of said barrel (3) and forming, with its end

directed toward the rear end of the firearm, a shoulder (15) for said spring (12), said spring engaging, with its other end, against a shoulder formed by said slide/breech-block (4), or breech-block; said support being constituted by said recoil spring guide (11) and said container (8) being connected to the end of said recoil spring guide (11) opposite to the end of said recoil spring guide (11) which forms said shoulder (15) for said spring.

3. Firearm according to the preceding claims, characterized in that said slide/breech-block (4) slidably engages guides (5) formed by said frame (2) and orientated substantially parallel to said sliding direction, said slide/breech-block (4) supporting said barrel (3) and having, below said barrel, a passage (16) which is slidably crossed by the end of said recoil spring guide (11) connected to said container (8) of the laser-beam aiming device (7).
4. Firearm according to one or more of the preceding claims, characterized in that said container (8) has a hole (10,50) for the exit of the laser beam, said hole being arranged substantially parallel to the axis of said recoil spring guide (11,31,51).
5. Firearm according to one or more of the preceding claims, characterized in that said exit hole (10) for said laser beam is arranged coaxially to said recoil spring guide (11,31).
6. Firearm according to one or more of the preceding claims, characterized in that said recoil spring guide (11) is internally provided with a seat (17) for batteries (18) or accumulators for supplying power to said laser beam source (9).
7. Firearm according to one or more of the preceding claims, characterized in that the axis (10a) of the exit hole (10) for the laser beam is arranged coaxially to said recoil spring guide (31) and in that a seat for batteries or accumulators for supplying power to said laser beam source (29) is formed in said container (28).
8. Firearm according to one or more of the preceding claims, characterized in that the axis (50a) of said exit hole (50) for the laser beam is spaced below said recoil spring guide (51), a seat for batteries (58) or accumulators for supplying power to said laser beam source being formed in said container (48).

9. Firearm according to one or more of the preceding claims, characterized in that a switch (19) for activating and deactivating said laser beam source (9,29) is provided on said container (8,28,48). 5
10. Laser-beam aiming device for automatic or semiautomatic firearms, such as pistols, rifles or the like, of the type comprising: a frame (2) which slideably supports, along a sliding direction substantially parallel to the axis (3a) of the firearm barrel (3), a slide/breech-block (4), or breech-block; an automatic recocking device for the automatic movement of said slide/breech-block (4), or breech-block, with respect to said frame (2) along said sliding direction upon firing and for its return into the initial position; characterized in that it comprises a container (8) accommodating a laser-beam source (9) and connected to a support (11) associable with said frame (2), said support (11) connected to said container (8) being formed as an element of the firearm re-cocking device. 10
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11. Laser-beam aiming device according to claim 10, characterized in that said support is constituted by the recoil spring guide (11) of said re-cocking device. 25
12. Laser-beam aiming device according to claims 10 and 11, characterized in that said container (8,28,28) has an exit hole (10,50) for the laser beam, said hole being orientated substantially parallel to the axis of said recoil spring guide (11,31,51). 30
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13. Laser-beam aiming device according to one or more of the preceding claims, characterized in that said exit hole (10) for said laser beam is arranged coaxially to said recoil spring guide (11,31). 40
14. Laser-beam aiming device according to one or more of the preceding claims, characterized in that said recoil spring guide (11) is internally provided with a seat (17) for batteries (18) or accumulators for supplying power to said laser beam source (9). 45
50
15. Laser-beam aiming device according to one or more of the preceding claims, characterized in that the axis (10a) of the exit hole (10) of the laser beam is arranged coaxially to said recoil spring guide (11,31) and in that a seat for batteries (38) or accumulators for supplying power to said laser beam source (29) is formed in said container (28). 55
16. Laser-beam aiming device according to one or more of the preceding claims, characterized in that the axis of said laser beam exit hole (50) is spaced below said recoil spring guide (51), a seat for batteries (58) or accumulators for supplying power to said laser beam source (9) being formed in said container (48).
17. Laser-beam aiming device according to one or more of the preceding claims, characterized in that a switch (19) for activating and deactivating said laser beam source (9) is provided on said container (8,28,48).

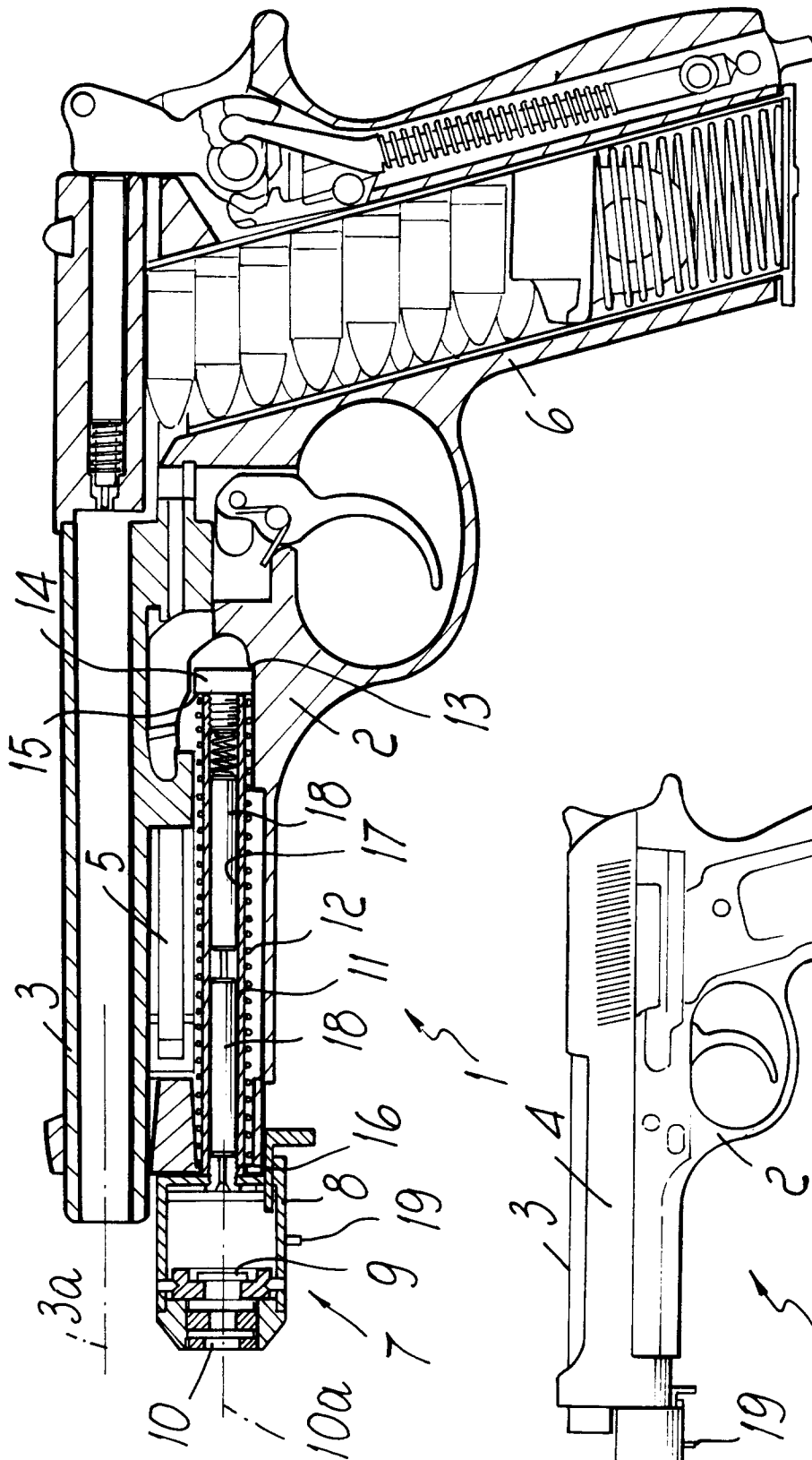


Fig. 2

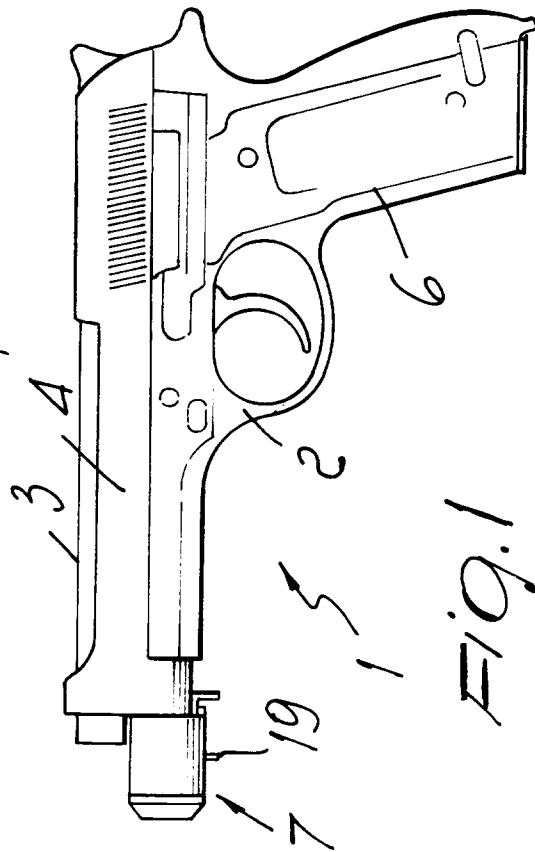


Fig. 1

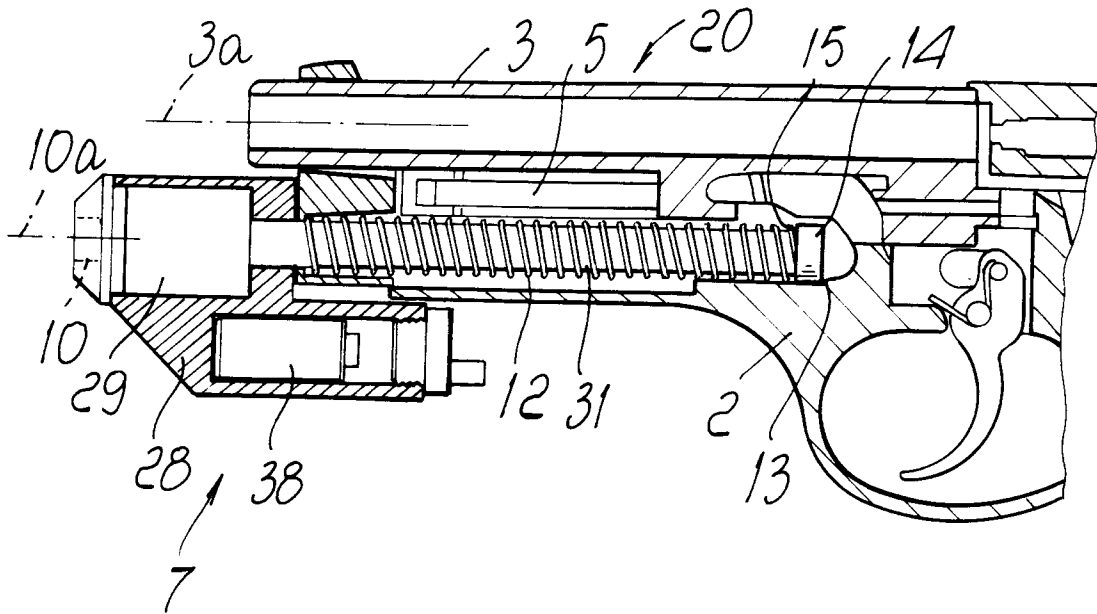


Fig. 3

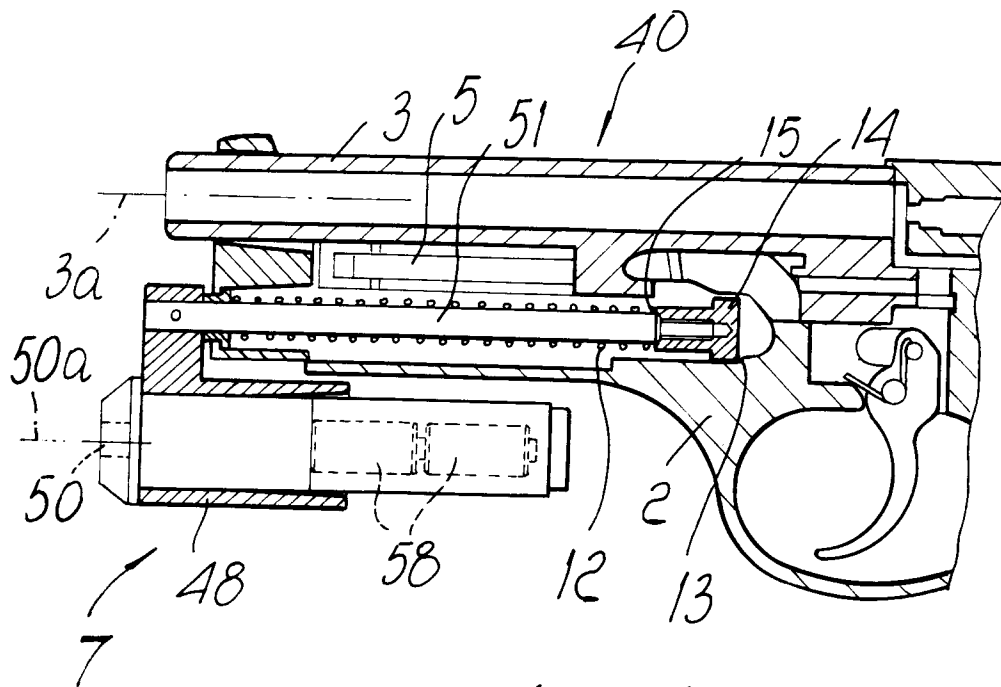


Fig. 4



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 93 11 9633

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
X	US-A-4 934 086 (W. HOUDE-WALTER) * column 1, line 7-12; figures 1-7 * * column 2, line 28 - column 3, line 52 * * column 4, line 45 - line 66 * ---	1-5, 9-13,17	F41G1/35
A	US-A-3 513 581 (O. SLATER) * column 2, line 14-54; figures 1-3 * ---	7-9, 15-17	
A	US-A-2 844 710 (R. ZINSSER) * column 1, line 46 - column 2, line 43; figures 1-4 * -----	7-9, 15-17	
			TECHNICAL FIELDS SEARCHED (Int.Cl.5)
			F41G
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 5 July 1994	Examiner Van der Plas, J
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