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des brevets



(11)

EP 2 017 567 A1

(12)

## EUROPEAN PATENT APPLICATION

(43) Date of publication:  
21.01.2009 Bulletin 2009/04

(51) Int Cl.:  
*F41A 19/10 (2006.01)*

(21) Application number: 08160060.3

(22) Date of filing: 10.07.2008

(84) Designated Contracting States:  
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR  
HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT  
RO SE SI SK TR**  
Designated Extension States:  
**AL BA MK RS**

(30) Priority: 20.07.2007 IT MI20071467

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### (54) Rapid locking system of the trigger plate to the action body of a firearm

(57) A rapid locking system (30) of a trigger plate (22) to the action body (21) of a firearm comprises a plunger (41) being attached to the action body, holding means (50) being attached to the trigger plate destined for engaging the plunger (41), the holding means (50) being in

the form of a bush and rotatably controlled to pass from an unblocked position to an engagement with the plunger (41) in a predefined arc, elastic means (68) acting on the holding means (50) to keep the coupling between the holding means (50) and the plunger (41) under tension.

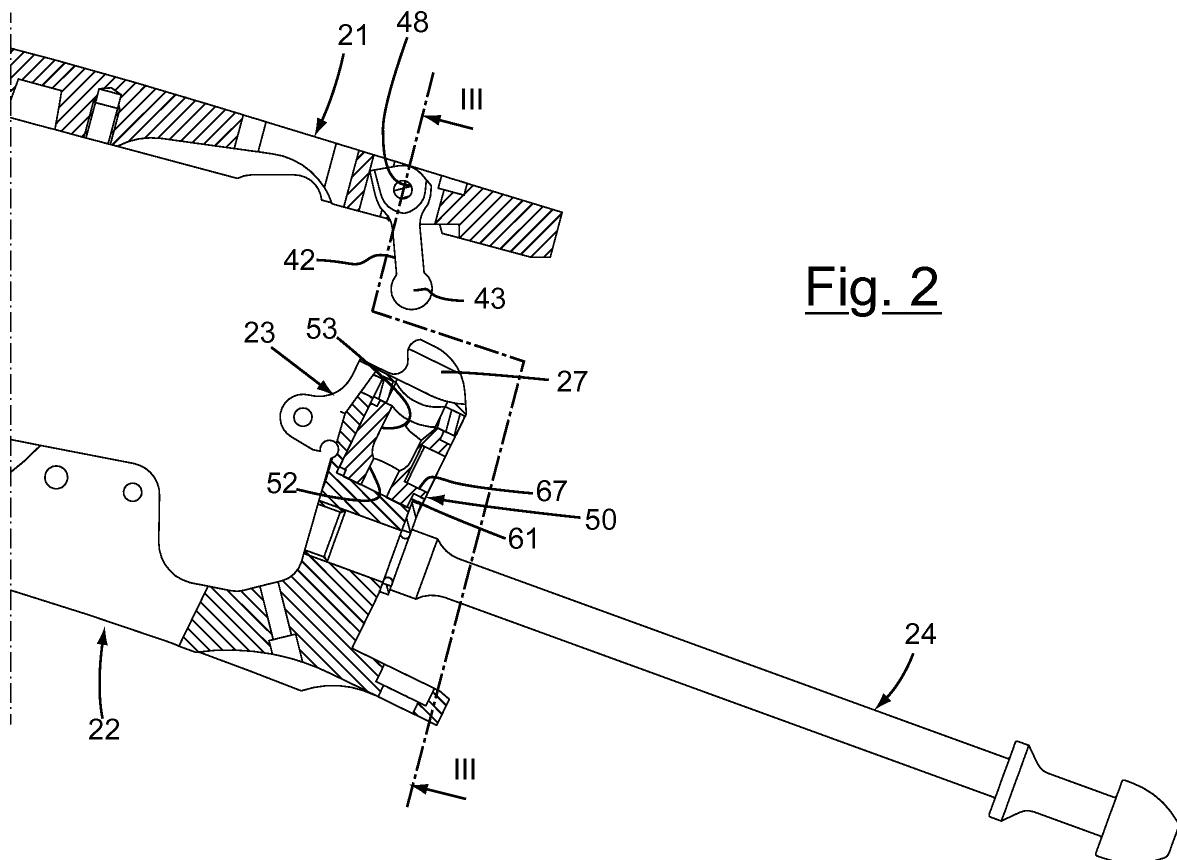


Fig. 2

**Description**

**[0001]** The present invention relates to a rapid locking system of the trigger plate to the action body of a firearm.

**[0002]** In particular, the invention relates to a rapid locking system destined for a long firearm such as a shotgun or a competition rifle, superimposed or parallel, in general, but not exclusively, swinging.

**[0003]** It is known that in long firearms the action body unit which represents the central part of the firearm to which the barrels are connected on one side and the stock on the other, can comprise the action body and trigger plate produced as separate assemblable elements.

**[0004]** According to the known art, this assembly is effected by means of a screw system.

**[0005]** It consequently occurs that after a certain number of shots and maintenance operations, the blockage is less effective and the trigger plate and action body tensioning must be restored.

**[0006]** The Applicant therefore considered the problem of how to produce an assembly of the trigger plate to the action body of a firearm with a rapid locking which is effective with time.

**[0007]** The Applicant has solved the above problems by providing a rapid locking system of the trigger plate to the action body of a firearm.

**[0008]** A main objective of the present invention is to provide a rapid locking system of the trigger plate to the action body of a firearm which recovers the clearances due to wear of the elements to guarantee an effective lockage even after intense and prolonged use of the firearm.

**[0009]** These and other objectives according to the present invention are achieved by means of a rapid locking system of the trigger plate to the action body of a firearm, according to what is specified in claim 1.

**[0010]** Further characteristics are indicated in the dependent claims.

**[0011]** The rapid locking system of the trigger plate to the action body of a firearm according to the invention comprises a plunger integral with the action body suitable for being engaged by holding means integral with the trigger plate, said holding means being rotatably controlled to pass from an unlocked position to an engagement with the plunger in a predefined arc, there being elastic means acting on said holding means to keep the coupling between the holding means and the plunger under tension.

**[0012]** The characteristics and advantages of a rapid locking system of the trigger plate to the action body of a firearm according to the present invention will appear more evident from the following illustrative and nonlimiting description, referring to the enclosed schematic drawings in which:

figure 1 is an exploded perspective view of the locking system according to the invention;

figure 2 is a raised sectional schematic side view of a action body of a long firearm provided with the locking system according to the invention in an unlocked position;

figure 3 is a front section of the receiver chamber according to the line III-III of figure 2;

figure 4 is a partially sectional raised side view of a action body unit of a long firearm provided with the locking system according to the invention in a locked position;

figure 5 is a front section of the action body unit according to the line V-V of figure 4;

figure 6a illustrates in a partial front section from behind according to the line N-N of figure 6b, a crosspiece of the action body unit with holding means in an open position;

figure 6b illustrates in a side section, a crosspiece of the action body unit with holding means in an open position;

figure 7a illustrates in a partial front section from behind according to the line R-R of figure 7b, a crosspiece of the action body unit with holding means in a locked position;

figure 7b illustrates in a side section a crosspiece of the action body unit with holding means in a locked position.

**[0013]** With reference to the figures, a firearm 10 presents a action body unit 20 comprising a action body 21 and a trigger plate 22 having a crosspiece 23 destined for the blockage of the trigger plate 22 to the action body 21.

**[0014]** A stock bolt 24 which extends from the crosspiece 23 to become engaged with the stock of the firearm (not shown) is fixed to the crosspiece 23 by screwing.

**[0015]** The rapid locking system 30 of the trigger plate 22 to the action body 21 of a firearm according to the invention, comprises a plunger 41 integral with the action body destined for being engaged by the holding means 50 integral with the trigger plate, said holding means 50 being rotatably controlled to pass from an unlocked position to an engagement with the plunger 41 in a predefined arc.

**[0016]** Elastic means 68 are also envisaged, which act on said holding means 50 to keep the coupling between the holding means 50 and the plunger 41 under tension.

**[0017]** The plunger 41 comprises a hole 48 for the insertion of a transversal pin 44 and a spiral spring 45 to allow the plunger to oscillate to facilitate its insertion into the trigger plate 22 and follow the rotation of the latter to become fixed to the action body 21.

**[0018]** In this respect, the action body is equipped with an opening 46 with holes 47 on the walls to house the pin 44 in which the plunger 41 is assembled.

**[0019]** For the assembly of the trigger plate 22 onto the action body 21, there is a lug 25, in the trigger plate close to the opposite end of the crosspiece, for being hinged to a corresponding shoulder 26 of the action body,

cooperating to form a hinge around which the trigger plate is rotated to bring it to a locking position.

**[0020]** The locking is ensured by the engagement of rounded flaps 27 protruding from the top of the crosspiece 23 to be inserted in the corresponding seats 49 symmetrically arranged on the two sides of the action body 21.

**[0021]** A neck 42 terminating in a spherical portion 43 destined for being engaged with the holding means 50, extends from the plunger 41.

**[0022]** The crosspiece 23, which extends substantially perpendicularly to the trigger plate in the direction of the action body, has two flaps 27 at the end, and between the flaps 27 there is a duct 60 for receiving the spherical portion 43 and the neck 42 of the plunger 41 from above, and, along the rear surface, a cavity 59 for housing the holding means 50 and the elastic means 68.

**[0023]** Said cavity 59 which is substantially oval and narrowed in the upper portion to receive the elastic means in the form of a crescent 68, is situated in a position above the engagement hole 57 of the stock bolt 24 and has a shaped annular grooving 58 along the outer edge suitable for receiving a ring-shaped stop spacer 55 from which a counterpart 56 extends.

**[0024]** Said stop spacer 55 is then inserted on the terminal portion of the stock bolt 24 to be withheld inside the grooving 58 and in turn to withhold the holding means 50 inside the hole 59 limiting their rotation.

**[0025]** The holding means 50 are in the form of a bush 51 having a transversal slit 52 extending for most of the circumference of the bush 51.

**[0026]** The slit 52 has a dimension slightly greater than the diameter of the neck of the plunger 41 and ends with a spherical seat 53 destined for receiving the spherical portion 43 of the plunger 41.

**[0027]** With particular reference to figures 6a, 6b, 7a, 7b, it should be noted that the internal surface 54 of the spherical seat 53 is in the form of a curvature which is variable with respect to the rotation centre C1 of the bush.

**[0028]** In this way, by passing from an opened position to a closed position, the traction is obtained of the spherical portion 43 on the part of the bush 51.

**[0029]** The plunger 41 in turn pulls the bush which elastically compresses the crescent 68.

**[0030]** Upon passing from a position of complete opening, i.e. the plunger unlocked, to a completely locked position, the rotation axis A1 of the bush 51 which is situated underneath the axis A2 of the spherical seat 54, passes above the latter effecting a translation of about 0.4 mm which correspond to the locking deformation exerted during the rapid locking traction.

**[0031]** In this way, the trigger plate and action body are rapidly and integrally assembled.

**[0032]** On the front of the bush 51, there is a shaped imprint 67 which is star-shaped or hexagonal or having a similar shape, for receiving the corresponding head of a key 70 for effecting rapid locking by rotating the bush 51, once the plunger 41 has been inserted with the spherical portion 43 in the slit 52 for an arc of about 180°.

**[0033]** Along the external edge of the bush 51, there is an annular throat 67 for receiving the counterpart 56 and terminating in a stop 61 suitable for coming into contact with the counterpart 56.

**[0034]** In particular, the stop 61 blocks the rotation of the bush in an unlocked position of the system, thus allowing the insertion of the plunger 41. The blockage run-end is provided by the contact of the leg 42 of the plunger 41 against the bush 50 (figure 7a).

**[0035]** The elastic means 68 are produced in the form of a crescent made of an elastomeric material for copying a portion of the circular profile of the bush to keep it elastically pressed.

**[0036]** The crescent 68 has a hole 69 for the passage of the spherical portion 43 and the neck 42 of the plunger 41.

**[0037]** The system according to the invention can be assembled on a long firearm, such as a rifle, preferably having a swinging barrel(s), i.e. in which the opening of the arm is produced by rotation of the barrel(s) with respect to the action body or on fixed-barrel semiautomatic firearms, without limitations as to the type of firearm which can be of the sports type (for example a superimposed or juxtaposed or single-barrel gun), with a smooth barrel.

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## Claims

1. A rapid locking system (30) of a trigger plate (22) equipped with a crosspiece (23) to the action body (21) of a firearm, **characterized in that** it comprises:
  - a plunger (41) integral with the action body;
  - holding means (50) integral with the trigger plate destined for engaging said plunger (41), said holding means (50) being rotatably controlled to pass from an unlocked position to an engagement with the plunger (41) in a predefined arc;
  - elastic means (68) acting on said holding means (50) to keep the coupling between the holding means (50) and the plunger (41) under tension.
2. The rapid locking system (30) according to claim 1, wherein said plunger (41) comprises a hole (48) from which a neck (42) extends, terminating in a spherical portion (43) destined for engagement with the holding means (50).
3. The rapid locking system (30) according to claim 2, wherein said holding means (50) are in the form of a bush (51) provided with a transversal slit (52) which extends for most of the circumference of the bush (51), said slit having a dimension slightly greater than the diameter of the neck of the plunger (41) and terminating with a spherical seat (53) destined for receiving the spherical portion (43) of the plunger (41).

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4. The rapid locking system (30) according to claim 3, wherein said spherical seat (53) has an internal surface (54) in the form of a curvature which is variable with respect to the rotation centre (C1) of the bush so that by rotating the bush, the plunger is drawn by this. 5

5. The rapid locking system (30) according to claim 3, wherein on the front of the bush (51) there is a shaped imprint (67) which is star-shaped or hexagonal or having a similar shape, for receiving the corresponding head of a locking key (70). 10

6. The rapid locking system (30) according to claim 5, wherein said bush (51) has, along a circumferential edge, an annular throat (66) terminating in a stop (61), suitable for coming into contact with the counterpart (56), the stop (61) being destined for blocking the rotation of the bush in an unlocked position of the system to allow the insertion of the plunger (41). 15

7. The rapid locking system (30) according to claim 1, wherein said elastic means (68) are produced in the form of a crescent made of an elastomeric material destined for copying a portion of the circular profile of the bush for keeping it elastically pressed, the crescent (68) having a hole (69) for the passage of the spherical portion (43) and the neck (42) of the plunger (41). 20

8. The rapid locking system (30) according to claim 2, wherein said plunger (41) has a hole (48) for the insertion of a transversal pin (44) and a spiral spring (45) to allow the plunger to oscillate to facilitate its insertion into said trigger plate (22) and follow the rotation which the latter must effect to become fixed to the action body (21), said action body (21) having an opening (46) with holes (47) on the walls to house the pin (44) carrying the plunger (41). 25

9. The rapid locking system (30) according to claim 8, wherein said action body (21) is provided with an opening (46) with holes (47) on the walls to house the pin (44) carrying the plunger (41). 30

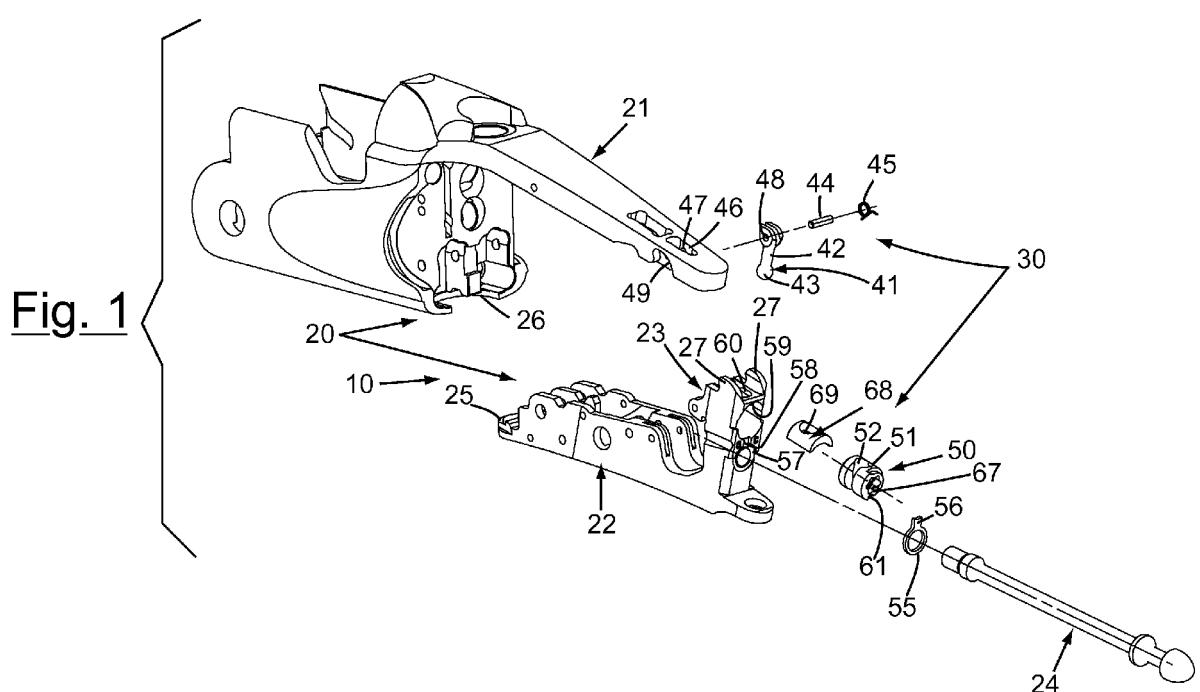
10. The rapid locking system (30) according to claim 9, wherein said crosspiece (23), which extends substantially perpendicularly with respect to the trigger plate in the direction of the action body, has at the upper end, a duct (60) for receiving the spherical portion (43) and the neck (42) of the plunger (41) from above, and, along the rear surface, a cavity (59) for housing the holding means (50) and the elastic means (68). 35

11. The rapid locking system (30) according to claim 10, wherein said cavity (59) which is substantially oval and narrowed is situated in a position above the en- 40

gagement hole (57) of a tie-rod (24) of the stock which can be fixed to said plate, said cavity (59) having a shaped annular grooving (58) along the outer edge, suitable for receiving a ring-shaped stop plate (55) from which a counterpart (56) extends, said stop plate (55) being destined for being inserted on the terminal portion of the tie-rod (24) of the stock to be withheld inside the grooving (58) and in turn to withhold the holding means (50) inside the hole (59) limiting their rotation. 45

12. The rapid locking system (30) according to claim 1, wherein for the assembly of the trigger plate (22) onto the action body (21), there is a lug (25) in the trigger plate close to the opposite end of the crosspiece (23), for being hinged to a corresponding shoulder (26) of the action body and a pair of rounded flaps (27) protruding from the top of the crosspiece (23) to be inserted in the corresponding seats (49) symmetrically arranged on the two sides of the action body (21). 50

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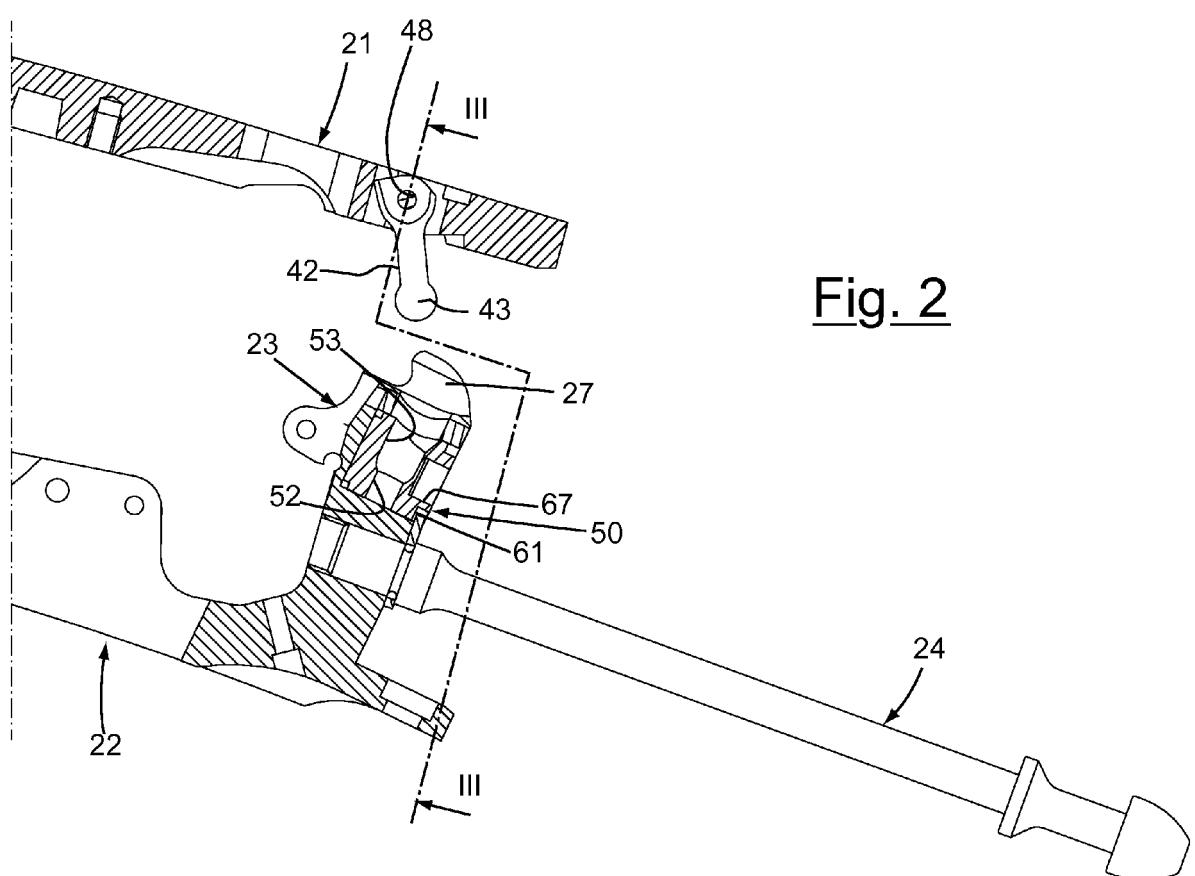


Fig. 2

Fig. 3

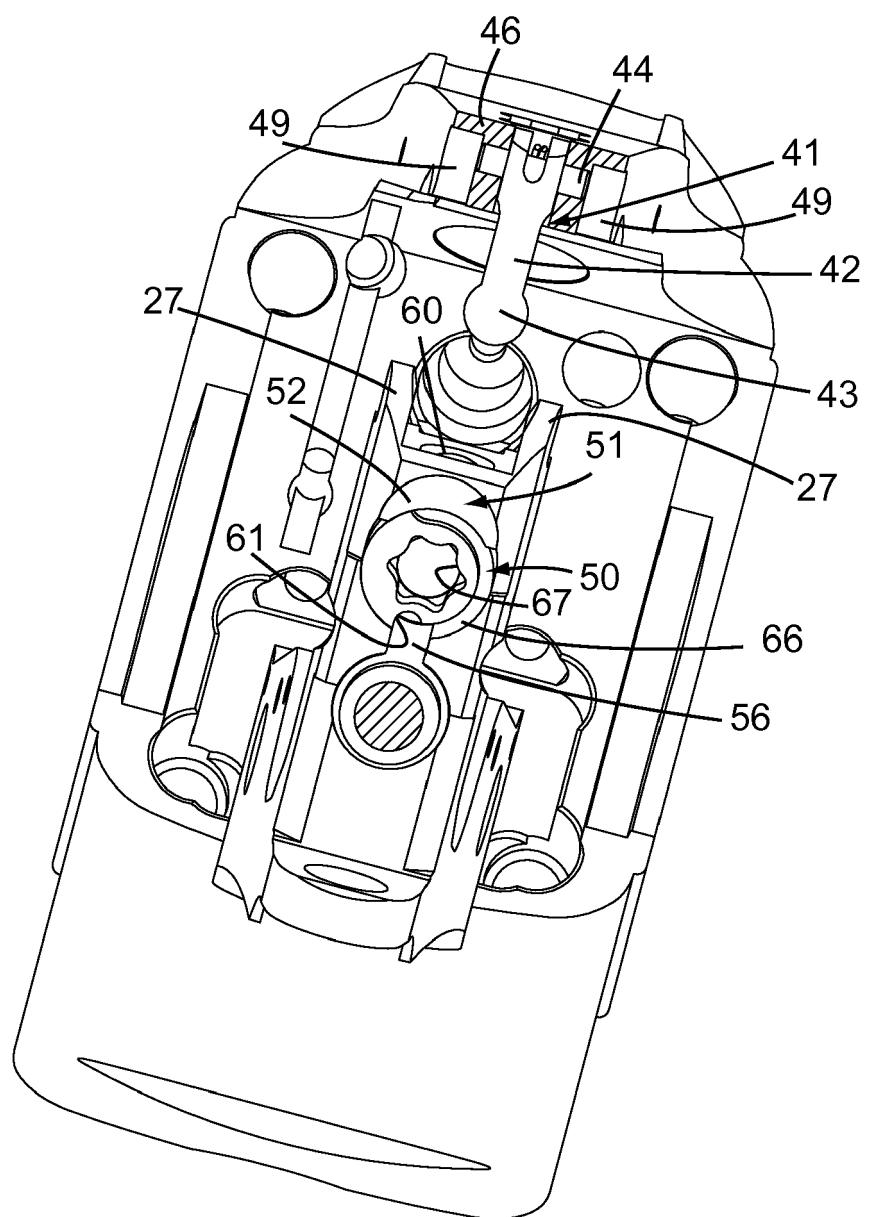
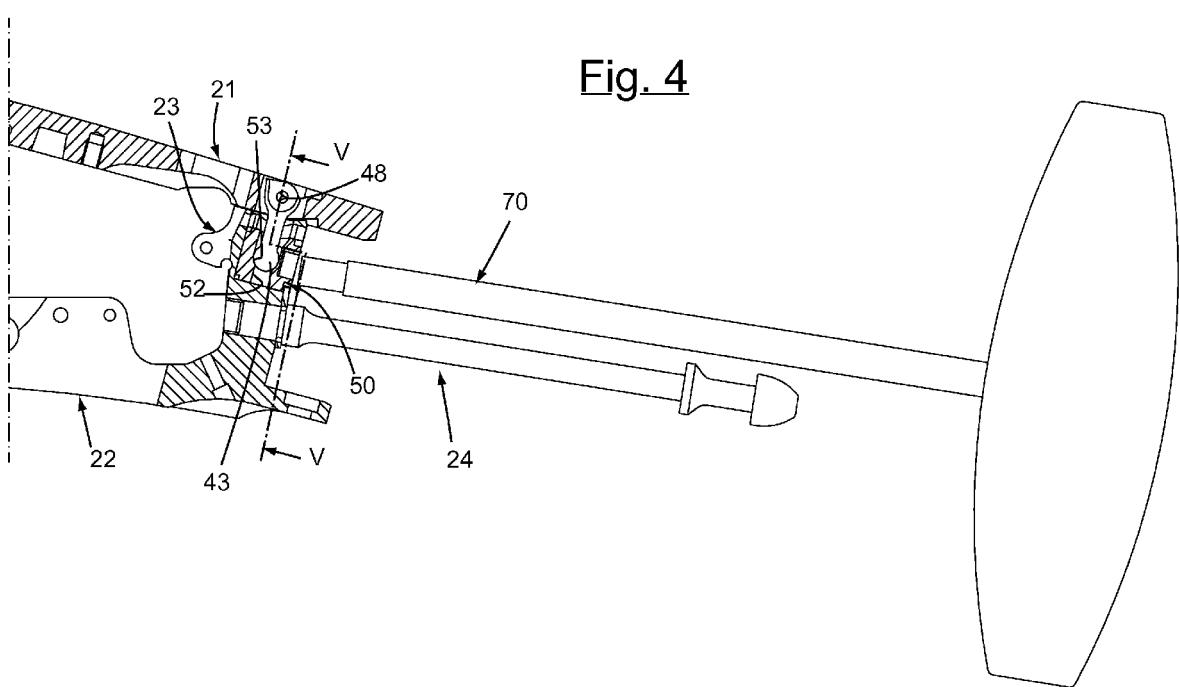


Fig. 4



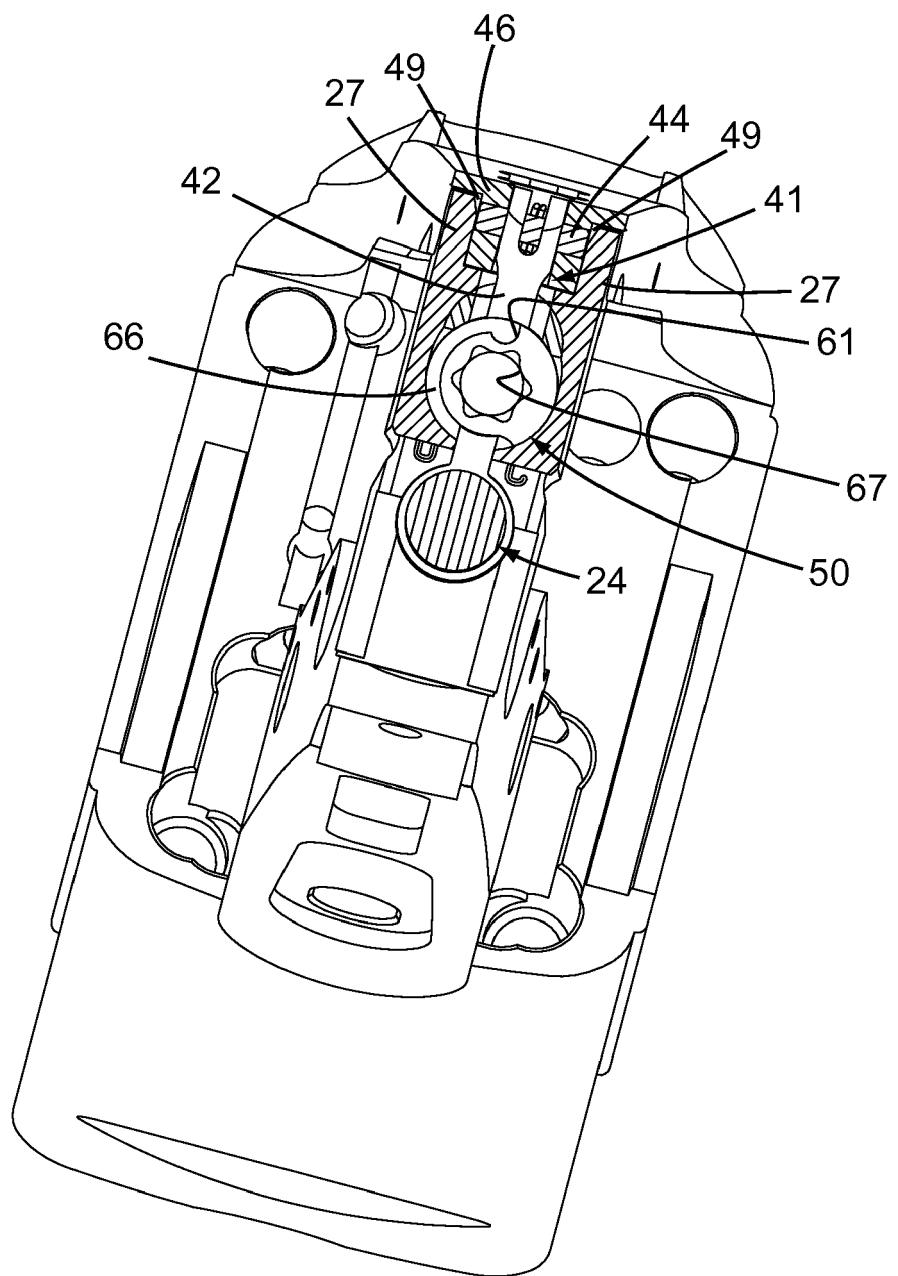


Fig. 5

Fig. 6a

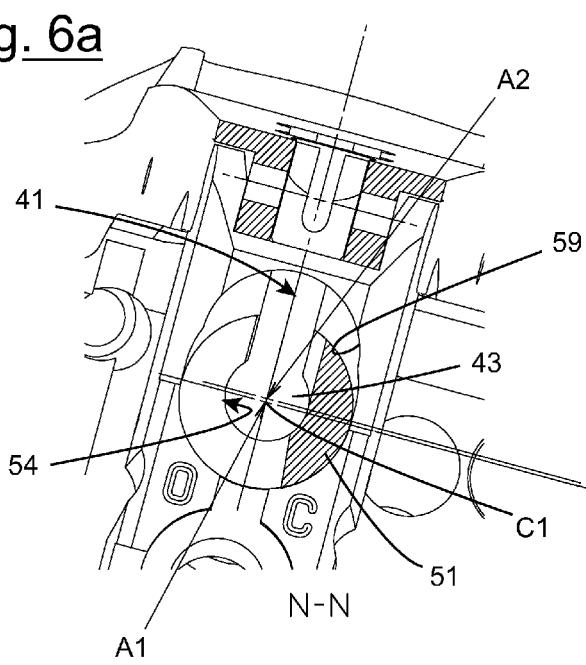


Fig. 6b

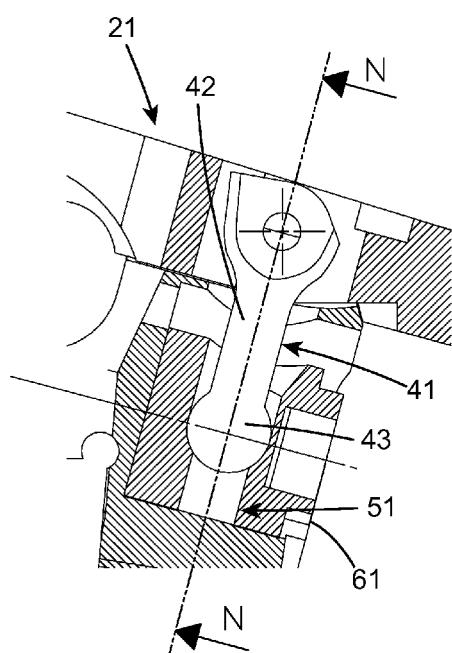


Fig. 7a

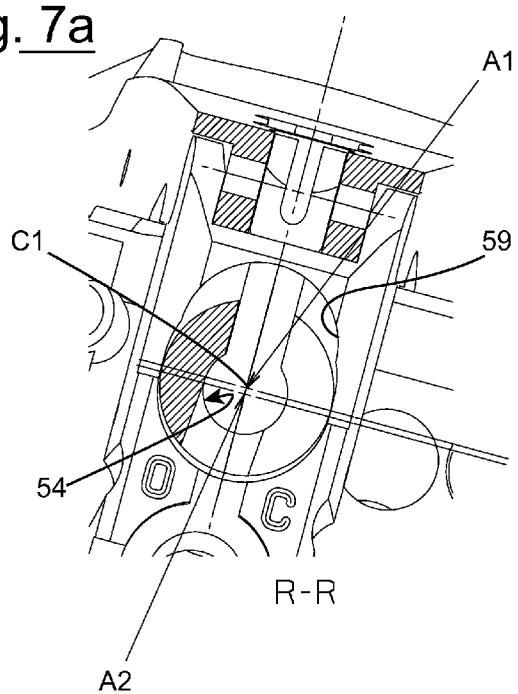
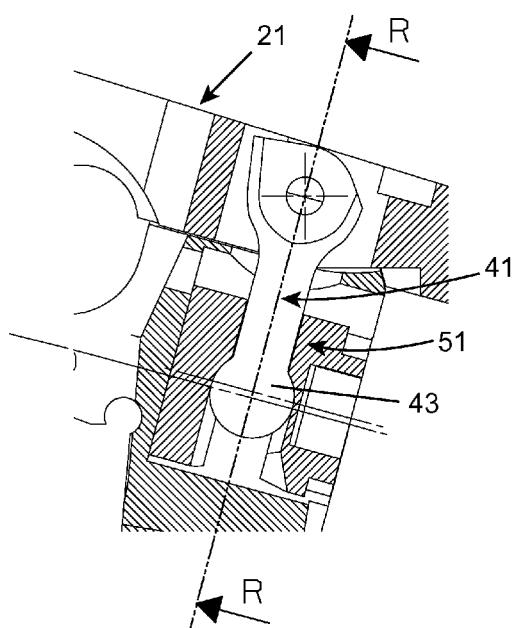


Fig. 7b





## EUROPEAN SEARCH REPORT

Application Number  
EP 08 16 0060

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (IPC)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	<p>"2007 - 2008 BERETTA ANNUAL" [Online] May 2007 (2007-05), BERETTA , BRESCIA (ITALY) , XP002499368 Retrieved from the Internet: URL:<a href="http://www.berettaservices.com/index.aspx?m=53&amp;did=960">http://www.berettaservices.com/index.aspx?m=53&amp;did=960</a>&gt; [retrieved on 2008-10-10] * page 63 * &amp; "682 Gold - 682 Gold Evolution" May 2007 (2007-05), BERETTA , BRESCIA (ITALY) Retrieved from the Internet: URL:<a href="http://www.berettaservices.com/Moduli/ContentManager/publicfiles/PDF%20Esplosi%20Arma%20Parti%20Speciali/e682g_ge.pdf">http://www.berettaservices.com/Moduli/ContentManager/publicfiles/PDF%20Esplosi%20Arma%20Parti%20Speciali/e682g_ge.pdf</a>&gt; [retrieved on 2008-10-10] * the whole document *</p> <p>-----</p>	1	INV. F41A19/10
A	<p>FR 1 519 013 A (M A P MANIFATTURA ARMI PERAZZI) 29 March 1968 (1968-03-29) * figures 1,2 * * page 1, left-hand column, paragraph 6 - right-hand column, paragraph 1 *</p> <p>-----</p>	1	TECHNICAL FIELDS SEARCHED (IPC)
A	<p>DE 20 2004 016800 U1 (MERKEL JAGD UND SPORTWAFFEN GM [DE]) 22 September 2005 (2005-09-22) * figure 1 * * paragraph [0017] *</p> <p>-----</p>	1	F41A
A	<p>GB 337 997 A (ERNST SCHOLZ) 13 November 1930 (1930-11-13) * figures 1,2 * * page 1, left-hand column, last line - right-hand column, line 82 *</p> <p>-----</p>	1-6	
The present search report has been drawn up for all claims			
1	Place of search The Hague	Date of completion of the search 14 October 2008	Examiner Schwingel, Dirk
CATEGORY OF CITED DOCUMENTS		<p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons</p> <p>.....</p> <p>&amp; : member of the same patent family, corresponding document</p>	
<p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p>			

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 08 16 0060

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14-10-2008

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