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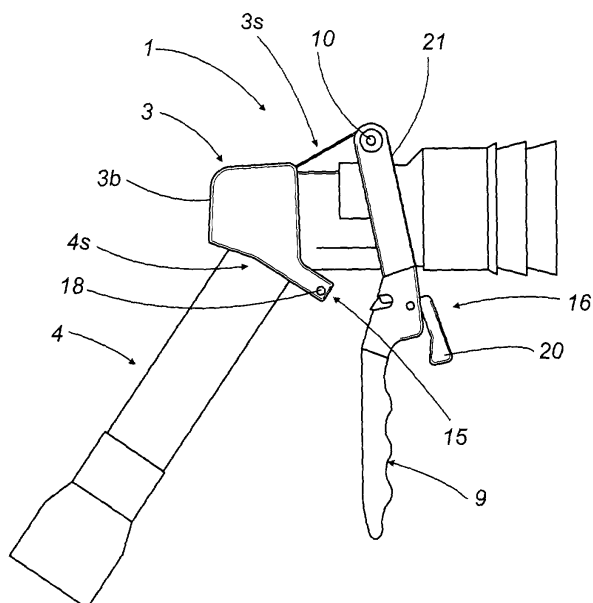
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(54) **Dispensing gun with locking device**

(57) A gun (1) for dispensing fluid fuel into a tank provided with a filler pipe (2) comprises a body (3) and a grip (4) having an upper end (4s) associated with the body (3) in correspondence with a rear portion (3b) of the body (3) itself. The dispensing gun presents means (8) for coupling onto the filler pipe (2), situated in correspondence with a front portion (3a) of said body (3) and a lever (9) able to oscillate about an axis (10) to move the coupling means (8) at least between a first non operative position and a second operative position for dis-

pensing the fuel. Means (14) are provided for locking the coupling means (8) in the operative position for dispensing the fuel, which means comprise a retaining element (15) integral with the body (3) in proximity with its rear portion (3b) and a latching element (16) pivotally engaged on the lever (9) and able to oscillate at least from a configuration of engagement with the retaining element (15) to lock the coupling means (8) in the operative position to a configuration of disengagement from the retaining element (15) to return the coupling means (8) to the non operative position.

FIG. 1



Description

[0001] The present invention relates to a gun for dispensing fuel, in particular gaseous fuel for motor vehicles.

[0002] Guns for dispensing gaseous fuel for motor vehicles provided with a conduit for the passage of the fluid which is dispensed through a dispensing head are known.

[0003] The head is able to couple with a corresponding filler pipe for the injection of the fuel, situated on the motor vehicle, and it is provided with coupling means that allow to maintain it in position on the aforesaid filler pipe. The coupling means are brought from a non operative position to an operative dispensing position by means of a lever fitted with a fork.

[0004] To maintain the coupling means on the filler pipe while the fuel is dispensed through the head, such dispensing guns are provided with means for locking the aforesaid coupling in the operative dispensing position.

[0005] In a known dispensing gun, the locking means are constituted by a pivot pin, housed in a transverse seat of the lever, which must be moved to be engaged with a projection obtained on the lower surface of the body of the dispensing gun, when the lever is brought into the operative position for dispensing the gaseous fuel.

[0006] To unlock the pivot pin from the projection, a pushbutton is provided which, contrasted by a spring inserted in the same lever, moves the pivot pin in such a way as to place it in a disengaged position relative to the projection. By maintaining the pushbutton pressed and the pivot pin in the disengaged position, the dispensing lever can thus be moved in order to return the coupling means to the non operative position.

[0007] Therefore, at the end of the fuel dispensing operation, to return the coupling means to the initial position, a user must act on the unlocking pushbutton and simultaneously move the lever in order to disengage the pivot pin from the corresponding projection.

[0008] This operation is not always easy to perform, in particular in service stations where the user carries out the refuelling operation by him/herself without the intervention of specialised personnel.

[0009] Very often, the user is not able to perform the locking operation with one hand, because the lever must be moved forward whilst maintaining the unlocking pushbutton pressed.

[0010] Since the fuel dispensing lever exerts a certain pressure on the locking pivot pin, the unlocking pushbutton is rather hard to press.

[0011] Moreover, the user is not always aware of the operation of the locking means and thus limits his/her actions to pressing the pushbutton and extracting the gun from the tank of the motor vehicle without moving the lever, and thus with the coupling means still in the operative position for dispensing. In this situation the conduit for the passage of the gas remains open when

the gun is removed from the tank, leading to the hazard of gas leakage into the outside environment.

[0012] The aim of the present invention is to provide an enhanced fuel dispensing gun in which it is easy to lock and unlock the coupling with the tank filler pipe of a motor vehicle.

[0013] A further aim of the present invention is to provide a dispensing gun in which the locking and the unlocking operation are immediate for any user.

[0014] In accordance with an aspect of the present invention, a fuel dispensing gun as specified in claim 1 is presented.

[0015] The depend claims refer to preferred and advantageous embodiments of the invention.

[0016] Embodiments of the present invention, purely by way of non limiting examples, are illustrated in the detailed description that follows, made with reference to the accompanying drawings, in which:

- Figure 1 shows the dispensing gun in a first preferred embodiment in a lateral view in which the coupling means are in a non operative position;
- Figures 1a and 1b show some constructive details of the dispensing gun of Figure 1;
- Figure 2 shows a cross section of the dispensing gun of Figure 1 associated to a filler pipe of a tank in a locked position of the coupling means;
- Figure 3 shows the dispensing gun of Figure 2 in the initial phase of unlocking of the coupling means from the filler pipe;
- Figure 4 shows a cross section of the dispensing gun in a second preferred embodiment associated with a filler pipe of a tank;
- Figure 5 shows the dispensing gun of Figure 4 in the initial phase of unlocking of the coupling means from the filler pipe.

[0017] In accordance with the figures of the accompanying drawings, the reference number 1 indicates a gun for dispensing fluid fuel, in particular gaseous fluid, into a tank provided with a filler pipe 2, such as the tank of a motor vehicle (not shown).

[0018] The gun 1 comprises a body 3 of substantially elongated cylindrical shape and a grip 4 having an upper end 4s associated with the rear portion 3b of the body 3 itself.

[0019] Inside the grip 4 is obtained a conduit 5 for supplying the fuel, which ends, at its first end 5i, with a coupling for a pipe feeding gaseous fuel from a dispensing device (not shown).

[0020] The conduit 5 communicates, in correspondence with a second end 5s, with a channel 6 for the passage of fuel obtained internally to the body 3 and able to be shut off by means of a valve 7.

[0021] In correspondence with the front portion 3a of the body 3 are positioned means 8 for coupling the piston 1 on the filler pipe 2 of the tank, which are moved between a first non operative position and a second op-

erative position for dispensing the fuel by means of a lever 9 able to oscillate about an axis 10.

[0022] In the illustrated embodiments, the coupling means 8 are constituted by a sleeve 11 able to slide on the body 3 of the gun 1 and provided with arms 12 presenting a tooth 13 at one end. The arms 12 are able to move radially in such a way that the teeth 13 achieve the coupling with the filler pipe 2.

[0023] The dispensing gun 1 is further provided with means 14 for locking the coupling means 8 in the operative fuel dispensing position, which means comprise a retaining element 15 integral with the rear portion 3b of the body 3 of the gun 1 in proximity to the lever 9.

[0024] According to the present invention, the locking means 14 comprise a latching element 16 pivotally engaged on the lever 9 and able to oscillate at least from a position of engagement with the retaining element 15 to lock the coupling means 8 in the operative position to a configuration of disengagement from the retaining element 15 itself to return the coupling means 8 to the non operative position.

[0025] Advantageously, the locking means 14 comprise elastic means 17, for instance a spring, interposed between the lever 9 and the latching element 16 to maintain the latching element 16 stably in the configuration of engagement with the retaining element 15.

[0026] In the embodiment illustrated in the figures, the retaining element 15 is constituted by a bar element 18 substantially parallel to the axis 10 of the lever 9, in such a way as to provide a greater available surface for the latching and render the locking easier and more stable.

[0027] The latching element 16 presents at a first end a contoured projection 19 able to be engaged with the bar element 18 in such a way as to ensure the locking in the operative position.

[0028] To facilitate the latching, the contoured projection 19 has a portion 19a inclined towards the bar element 18.

[0029] More specifically, the angle α of the inclined portion 19a must be between 65 degrees and 25 degrees and preferably be 50 degrees; the angle α is measured relative to a plane P passing between the fulcrum axis of the latching element 16 and tangential inferiorly to the surface of the bar element 18 in the area of the part 18a.

[0030] The particular inclination of the portion 19a favours an easy sliding of the latching element 16 on the bar element 18, in such a way as to avoid jamming and sticking when the lever 9 for dispensing the fuel is operated.

[0031] The latching element 16 further comprises an inner portion 19b that presents a surface whose diameter is substantially similar to that of the bar element 18 and which extends for an arc that insists on an angle β - measured at the centre of the arc - greater than 90 degrees, and preferably with an angle β of 120 degrees.

[0032] Also the particular measure of this angle β favours a secure latching of the element 16 to the bar el-

ement 18 and at the same time allows an easy unlatching of the element 16 at the end of the fuel dispensing operation when the lever 9 must be returned to the position where fuel dispensing is shut off.

[0033] At a second end, the latching element 16 has a grip element 20 substantially parallel to the lever 9, to impart the rotation to the latching element 16 relative to the fulcrum. In this way the distance between the point of application of the force necessary to impart the rotation and the fulcrum is increased and the force required to achieve the unlocking is decreased.

[0034] The grip element 20 can be oriented towards the lower portion of the gun 1 (Figures 2 and 3), or towards the upper portion (Figures 4 and 5).

[0035] According to the embodiment shown in the Figures, the lever 9 has a fork shaped upper end 21 positioned externally relative to the body 3 of the gun 1 inside grooves obtained on the coupling sleeve 11.

[0036] The fork 21 is pivotally engaged in proximity to the upper exterior surface 3s of the body 3 of the dispensing gun 1, enabling the displacement of the lever 9 in advanced position to unlock the coupling means 8 by the application of a reduced force.

[0037] Advantageously, the lever 9 has a seat 22 for housing the latching element 16, situated in correspondence with a lower end 21i of the fork 21, in such a way as to diminish the size of the locking means.

[0038] In use, to carry out the fuel dispensing operation, bringing the lever 9 towards the grip 4, the fork 21 moves the coupling means 8 towards the filler pipe 2 making the sleeve 11 slide on the body 3 of the gun 1.

[0039] When the projection 19 of the latching element 16 comes in contact with the bar element 18, the latter slides on the inclined portion 19a of the projection 19 so that the latching element 16 compresses the spring 17.

[0040] The displacement of the latching element 16 relative to the bar element 18 occurs automatically thanks to the particular angle of the inclined portion 19a and thanks to the particular shape of the part 18a of the bar element 18 which comes in contact with the aforesaid inclined portion 19a.

[0041] Continuing the displacement of the lever 9 in the direction of the grip 4, the projection 19 is first brought to the position of engagement with the bar element 18 and then maintained in the same position by the spring 17.

[0042] In this way, the displacement of the lever 9 is stopped and the coupling means 8 are locked on the filler pipe 2 in the operative fuel dispensing position.

[0043] To accomplish the unlocking operation, as shown in Figure 3, one acts on the grip element 20 making it rotate in the direction of the body 3 of the gun 1, in such a way as to disengage the projection 19 of the latching element 16 from the bar element 18. The lever 9 can then be easily moved away from the grip 4 so that the fork 21 returns the coupling means 8 to the initial non operative position.

[0044] In the embodiment of Figure 4, to accomplish

the unlocking operation, one acts on the grip element 20 in the direction of the grip 4 in such a way as to make the latching element 16 rotate towards the body 3 of the gun 1 disengaging the projection 19 from the bar element 18 (Figure 5).

[0045] The dispensing gun according to the present invention thus allows easily to achieve the locking and unlocking of the means for coupling on the tank filler pipe.

[0046] To unlock the lever, it is sufficient to exert a simple pressure on the grip element in such a way as to cause it to rotate and thus disengage the latching element from the retaining lever.

[0047] Once the latching element is disengaged, the lever automatically moves to the advanced position, returning the coupling means to the non operative position at the end of the dispensing operation.

[0048] It is therefore sufficient for a user to act on a single element to accomplish the unlocking operation, with no need to carry out different operations in succession, which are often known only to specialised personnel.

[0049] The danger that a user may disengage the gun from the tank when the coupling means are still in the operative fuel dispensing position is therefore eliminated. Moreover, the disposition of the fulcrum of the lever in proximity to the upper surface of the body of the gun allows to move the lever to the locking position using less force, and thus making the refuelling operation easier.

Claims

1. A gun (1) for dispensing fluid fuel into a tank provided with a filler pipe (2) comprising:

a body (3);
a grip (4) having an upper end (4s) associated with said body (3) in correspondence with a rear portion (3b) of the body (3) itself;
means (8) for coupling said gun (1) on said filler pipe (2), said coupling means (8) being situated in correspondence with a front portion (3a) of said body (3); a lever (9) able to oscillate about an axis (10) to move said coupling means (8) at least between a first non operative position and a second operative position for dispensing the fuel;
means (14) for locking said coupling means (8) in said operative fuel dispensing position, said locking means (14) comprising a retaining element (15) integral with said body (3) in proximity to its rear portion (3b),

characterised in that said locking means (14) comprise a latching element (16) pivotally engaged on said lever (9) and able to oscillate at least from

a configuration of engagement with said retaining element (15) to lock said engagement means (8) in said operative position to a position of disengagement from said retaining element (15) to return said coupling means (8) to said non operative position.

2. A gun as claimed in claim 1, **characterised in that** said locking means (14) comprise elastic means (17) interposed between said lever (9) and said latching element (16) to maintain said latching element (16) stably in said configuration of engagement with said retaining element (15).
3. A gun as claimed in claim 1 or 2, **characterised in that** said retaining element (15) is constituted by a bar element (18) substantially parallel to the axis (10) of said lever (9).
4. A gun as claimed in claim 3, **characterised in that** said latching element (16) presents at a first end a contoured projection (19) able to be engaged with said bar element (18).
5. A gun as claimed in claim 4, **characterised in that** the latching element (16) comprises an inner portion (19b) that presents a surface whose diameter is substantially similar to that of the bar element (18) and which extends for an arc that insists on an angle (β) - measured at the centre of the arc - exceeding 90 degrees.
6. A gun as claimed in claim 4 or 5, **characterised in that** said contoured projection (19) presents a portion (19a) that is inclined towards the bar element (18).
7. A gun as claimed in claim 6, **characterised in that** the angle (α) of the inclined portion (19a) is between 65 degrees and 25 degrees; the angle (α) being measured relative to a plane (P) passing between the fulcrum axis of the latching element (16) and tangential inferiorly to the surface of the bar element (18).
8. A gun as claimed in any of the previous claims, **characterised in that** said latching element (16) presents at a second end a grip element (20) substantially parallel to said lever (9), to impart the rotation to said latching element (16) relative to the fulcrum.
9. A gun as claimed in any of the previous claims, **characterised in that** said lever (9) presents a fork shaped upper end (21) pivotally engaged in proximity to the upper external surface (3s) of said body (3).
10. A gun as claimed in claim 9, **characterised in that**

said lever (9) presents a seat (22) for housing said latching element (16), said seat (22) being situated in correspondence with a lower end of said fork (21).

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FIG.1

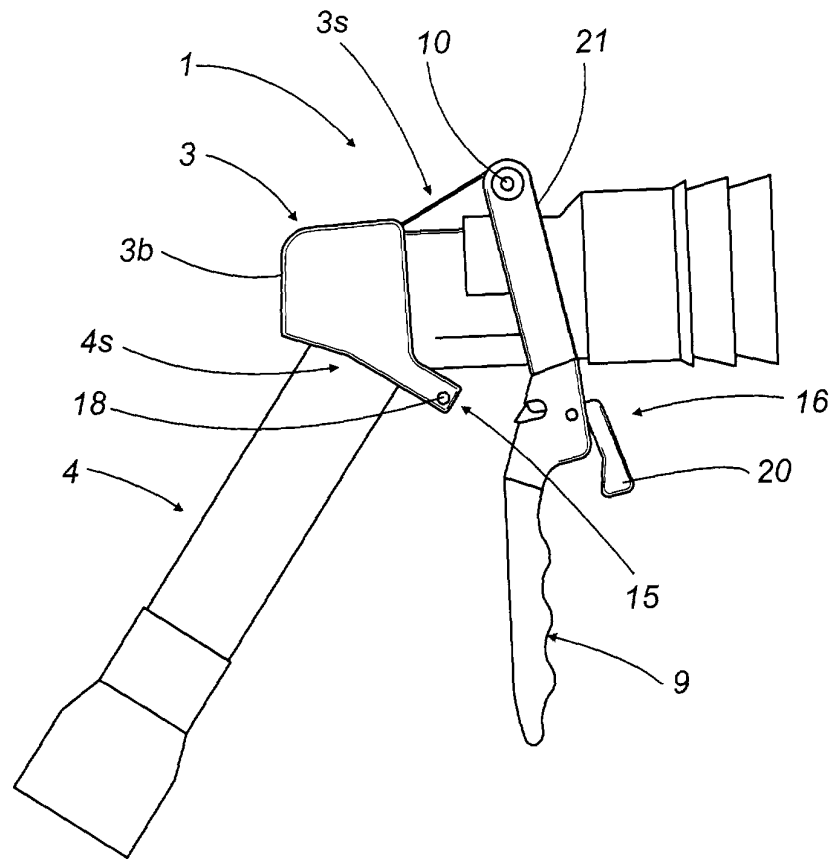


FIG.1a

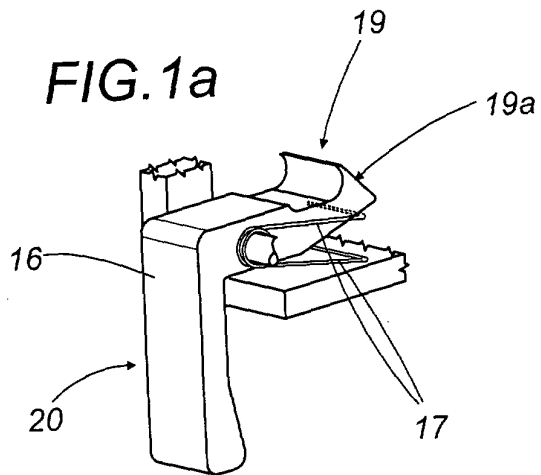


FIG.1b

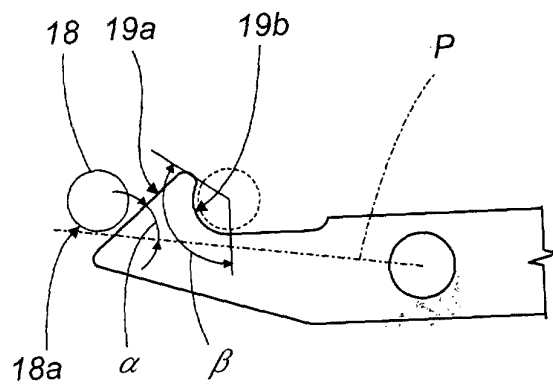


FIG.2

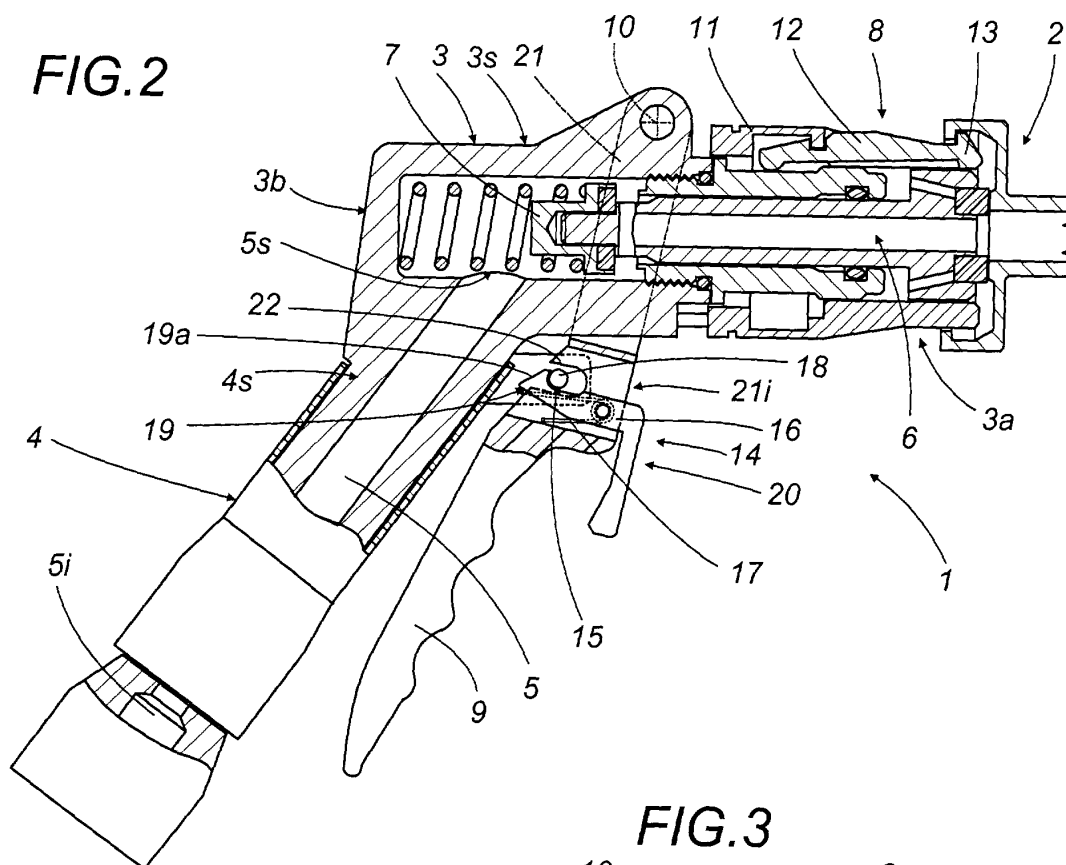
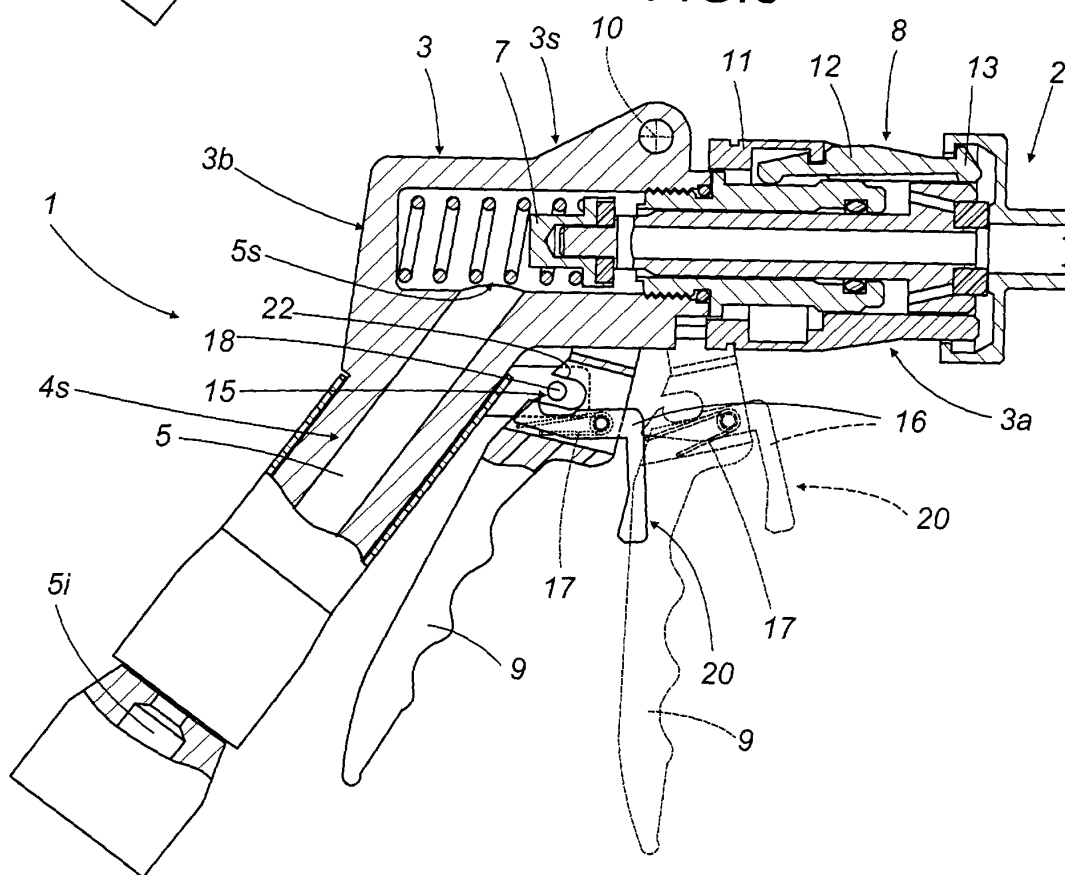
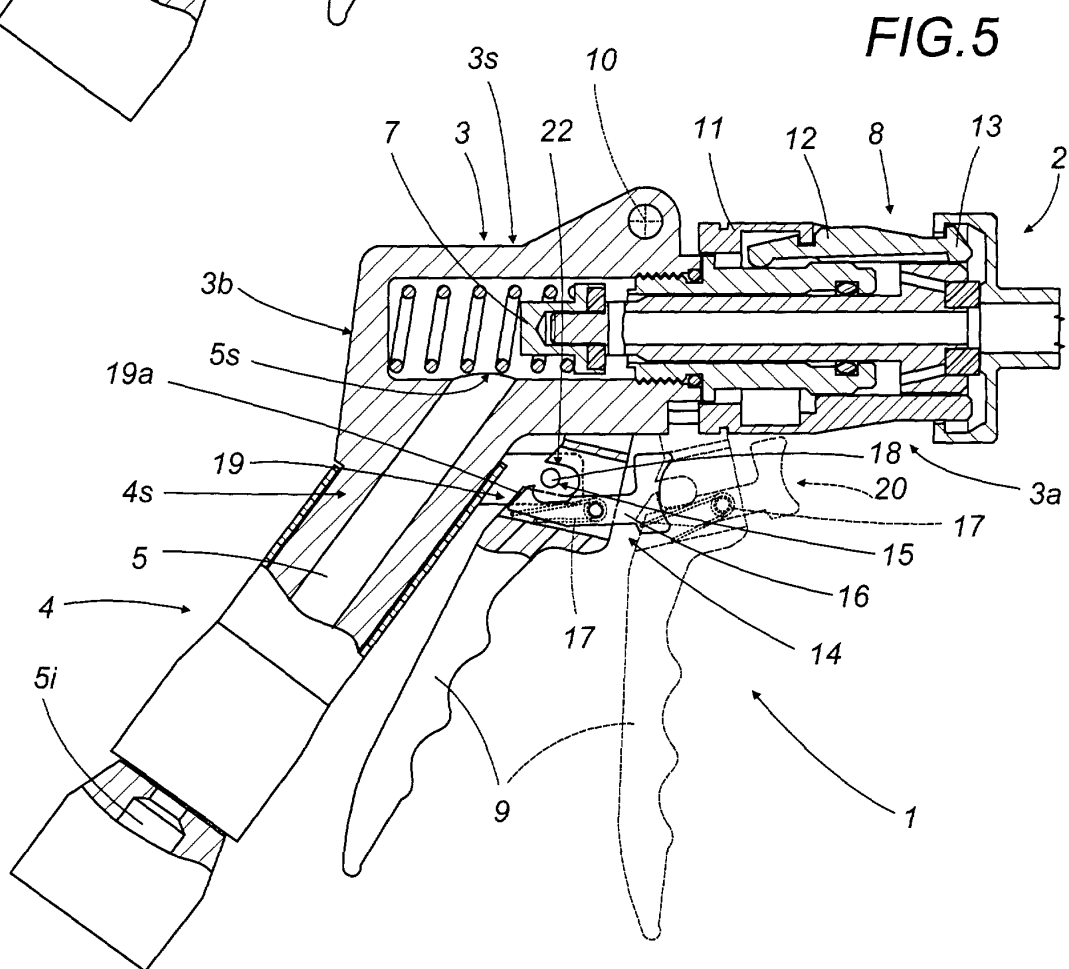
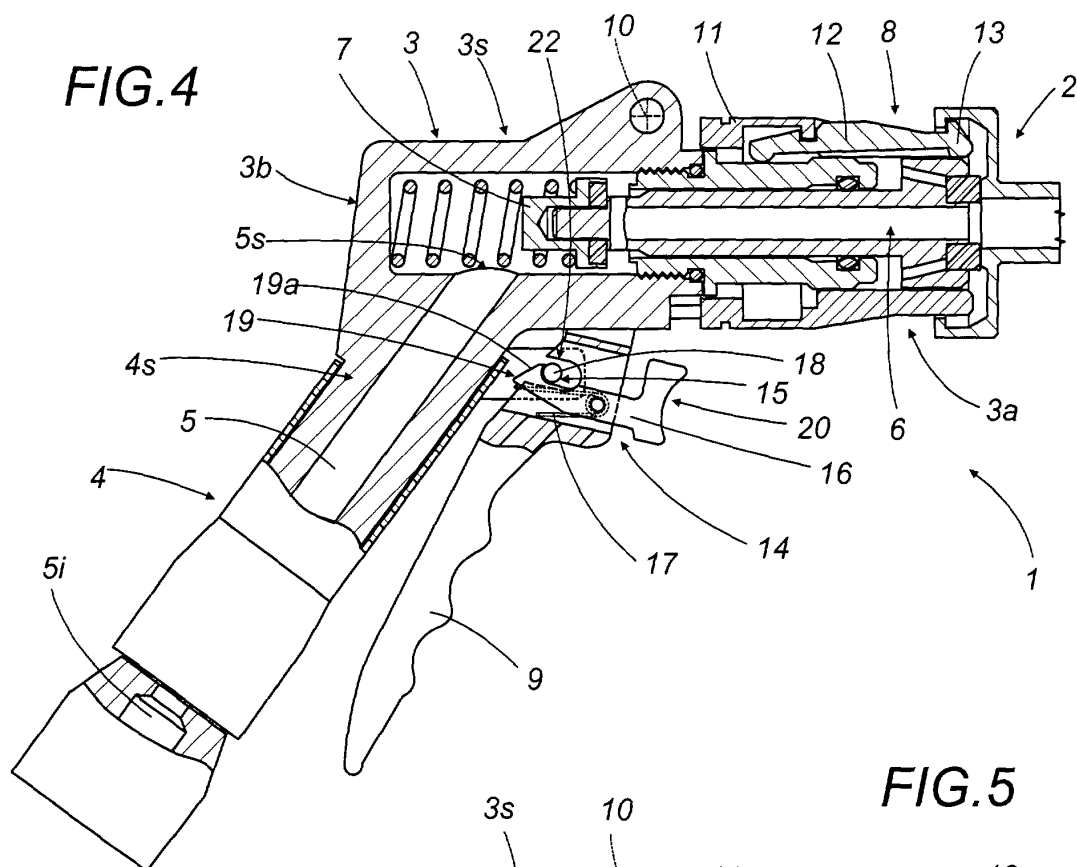


FIG.3







European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 01 83 0141

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.7)
Y	EP 1 006 310 A (FRASCAROLI FRANCO ;FIUMI PIERO (IT)) 7 June 2000 (2000-06-07)	1	B67D5/06 B67D5/375 B67D5/02
A	* the whole document *	9	
Y	DE 12 26 904 B (JÜRGENS & WAYNE APPARATE-UND PUMPENBAU GMBH)	1	
A	* column 3, line 7 - line 44; figures *	3-6,8	
A	GB 999 495 A (SCHEIDT & BACHMANN GMBH) 28 July 1965 (1965-07-28) * page 2, line 58 - line 64; figure 1 *	1	
A	US 4 022 235 A (MURRAY ROBERT L ET AL) 10 May 1977 (1977-05-10) * column 3, line 15 - line 49; figures 1,12 *	1	
A	IT 1 292 840 B (FRASCAROLI FRANCO ;FIUMI PIERO (IT)) 11 February 1999 (1999-02-11) * the whole document *	1	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B67D
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		1 October 2001	Jelercic, D
CATEGORY OF CITED DOCUMENTS 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 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 & : member of the same patent family, corresponding document			

EPO FORM 1503 03 82 (P04001)

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

EP 01 83 0141

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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01-10-2001

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1006310	A	07-06-2000	EP 1006310 A2	07-06-2000
DE 1226904	B		NONE	
GB 999495	A	28-07-1965	NONE	
US 4022235	A	10-05-1977	NONE	
IT 1292840	B	05-10-1998	IT B0970199 A1	05-10-1998