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(54) **Ball valve basket with idiot proof safety**

(57) The invention relates to an improved dispensing gun, for example for delivering PU foam, wherein the gun comprises a product inlet passage and an oulet passage, the inlet passage itself comprising a basket (3) for adapting a pressurized can (5) and a ball valve. There is provided a safety feature consisting in a member (9) slidable under the basket, which will prevent, in normal operation, the handle 2 of the ball valve of being in an open position in the absence of a can affixed on said basket. The safety member is biased by a spring and has a side slot (10), comprising an enlarged middle section, traversed by the axle (11) of a handle, having a non-circular transversal cross section, for closing and opening the ball valve.

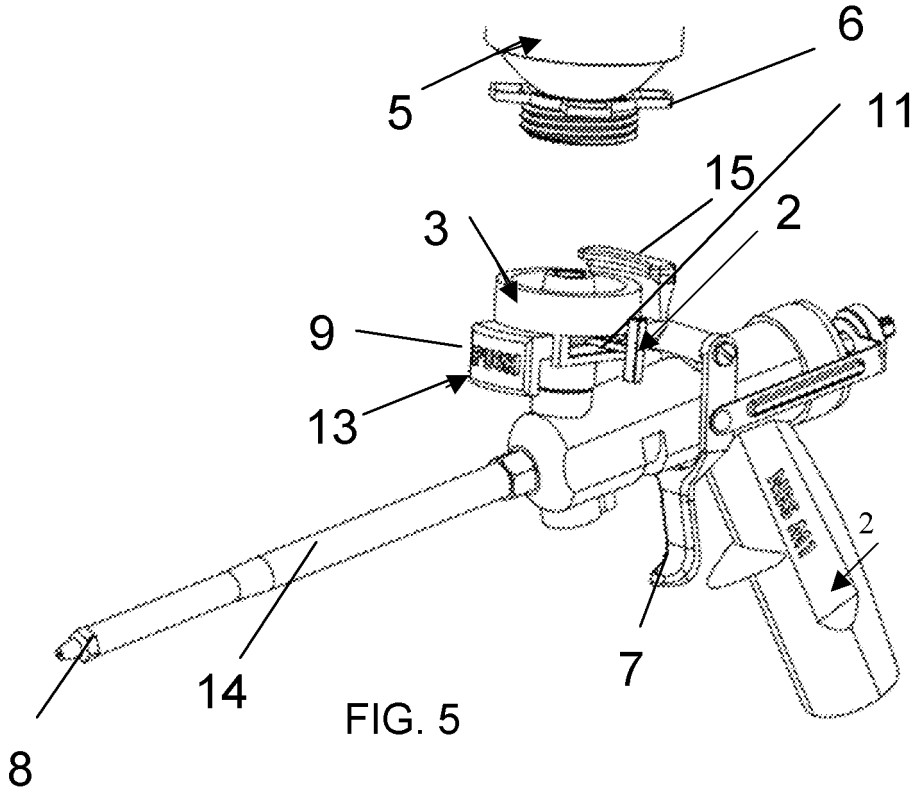

FIG. 5

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Description

[0001] The invention relates to an improvement for a hand-held foam applicator or "gun" for producing foam, more particularly one component polyurethane foam.

[0002] Such applicator comprises typically a handgrip, a body, a steel barrel with a nozzle tip, an adaptor or fitting for attaching a can - also called a "basket" , and a needle assembly comprising a pressure spring with one end obturating the nozzzle tip and being drawn back via a trigger arrangement for delivery of the foam from the can through the barrel and the nozzle.

[0003] Between the can and the gun, there is usually a valve assuring the connection. This allows the easy and neat change from one can to another.

[0004] Nowadays for this purpose a non-return ball with spring is used in polyurethane guns (PU-Guns). But this system has a few disadvantages:

- When foam remains in the basket after cleaning, these remains will cure out and form a barrier. This barrier makes good closing impossible. So foam will come out of the gun when filled with foam under pressure.
- When the gun is cleaned, a mix of foam and acetone sticks on the basket. This causes an adhesion between the basket and the non-return ball.

To remove this sticking, consumers take a thin, sharp object to push on the Teflon ball.

[0005] This causes damage of the line closing system between the Teflon ball and the basket.

- The non return ball needs a minimum pressure to open which is to be substracted from the pressure of the delivered foam in the gun. This leads to less output and more foam remains in the can with a residual pressure therein.

[0006] For these reasons, another type of adaptor has been developped and proposed on the market (for example the adaptor NBS- F) . This F-adapter is a standard basket, but without non return ball. The opening-closing of this system is regulated by a ball valve.

[0007] The distance between the ball valve and the opening of the can in the F-adapter is very important because foam can cure out. The system would be better when the distance is as small as possible. This means that the stem of a valve should almost "touch" the ball valve. This system of the prior art is called the Ball Valve Basket.

[0008] However, this improved system has also some disadvantages.

[0009] When the gun is filled with foam under pressure and a user turns the ball valve open once the can has been removed, he could get foam in his eyes or on his face.

[0010] According to the present invention, there is provided a further improvement in the construction of a foam applicator.

[0011] An object of the invention is to provide a new closing system for the basket in a dispensing gun to prevent such accident. The arrangement allows the costumer to turn on the ball valve only when there is a can on the gun. This can be filled with either PU-foam or PU-cleaner.

[0012] A further object of the invention is to provide an automatic system closing a ball valve when no can is affixed to the gun.

[0013] The invention will be better understood with reference to the following detailed description of the attached drawings provided in an exemplative way only. It will be understood that the gun may be embodied in a number of different forms and certain of the parts may be constructed and arranged in a different manner.

Fig. 1 is a view of a ball valve adpated on a gun according to the prior art
Fig. 2 is a sectional view of the ball valve of fig. 1
Fig. 3 is a sectional view of a beall valve in the open position
Fig. 4 is a sectional view of a ball valve in a closed position
Fig. 5 is a general view of the gun with the adpater and the safety member according to the invention
Fig. 6 and 7 are detailed views of the handle of a ball valve in open and closed position
Fig. 8 is a more general view of the safety member arrangement
Fig. 9 illustrates the gun with the can affixed on the adapter
Fig. 10 is a perspective view from the bottom
Fig. 11 shows the adapter when no can is affixed
Fig. 12 illustrates another embodiment of the invention
Fig. 13 illustrates still another embodiment of the invention
Figs. 14 and 15 illustrate in perspective views various positions of the axle (cross-sectioned) in the slot provided in the safety members.

As shown in Figs. 1 to 4 prior art provides a ball valve 1 with a handle 2 and an associated adapter 3 for receiving a ring and a can. This valve regulates the opening-closing to the passage through the gun. The assembly may be screwed to the gun via a lower threaded section 4. The distance A should however be designed as short as possible as shown in figs. 3 (sectional view) and 4 (part sectional view) in order to prevent accumulation of a product able to cure between the valve and the can. This means that the top of the stem of the can valve should almost "touch" the ball valve.

[0014] Fig. 5 shows a complete assembly acording to the invention. There is a can 5 with a ring 6 to be screwed or clamped in a basket 3. The gun has a trigger 7 for moving a needle (not shown) and closing/opening the

nozzle 8.

There is illustrated a safety member 9 in the form of a drawer that can be pushed or slided under the basket on one side, (here away from the barrel 14 side, the front side) against a spring. When released, due to the biasing action of the spring, the member 9 will come back at its initial position in the absence of a can. If a can has been affixed the vertically extending part will contact or engage the ring-can assembly 5, 6 in a blocking or locking arrangement so that the safety member is immobilized in a particular position and biased by the spring. For this particular position a handle's axle traversing the safety member through a specifically enlarged portion 12 of a longitudinal slot 10 provided lateraly on this member 9 will be able to rotate by 90° and therefore to open the inlet passage. In all other longitudinal positions of the drawer 9 the handle cannot rotate because the highest dimension of the cross-section of its axle 11 does not permit rotation in a non-enlarged part of the slot 10.

[0015] FIG. 6 is a detailed view showing the enlarged section 12 of the slot 10 and the axle 11 in the open position. The largest cross-sectional dimension of the axle is then vertical.

[0016] In this position of the axle along the slot the user can indeed activate the ball valve. He can open or close it, in this position there is a can on the gun. The ball valve handle is in the vertical position, this means that the ball valve is opened. In this position, the user is not able to push on the "PUSH" button 13 because the safety system cannot slide on the basket. As mentioned, the "half round" axle prevent this from sliding in this position.

[0017] In FIG. 7 the handle has been turned, so the ball valve is closed. In this position it is possible to slide the safety memeber 9.

[0018] In FIG. 8 it is shown in a more detailed way that the safety member 9 can slide under the basket 3 under the influence of the Push button 13, the handle remaining fixed relative to the adapter 3 and the body of the gun.

[0019] In FIG. 9 the safety system is fully pushed against the basket, now the can and ring assembly is disengaged and can be turned out from the basket 2. The locking part from the safety member is no longer obstructing the ring.(note that this is only possible when the ball valve is closed.) FIG. 10 is a part view from bottom illustrating the ring biasing the safety drawer so that at rest the latter is in a closing configuration.

[0020] As shown in Fig. 11 once the can is removed, the safety system 9 springs back towards the front of the gun. This is caused by the metal spring 16 on the bottom of the system. In this position it is impossible to open the ball valve because the safety is not in the right position.

[0021] Only when the user 1) pushes on the button, 2) screws on the can and release the button shall the slot of the safety memeber be in a position permitting the ball valve to be activated.

[0022] In FIG. 12 another embodiment of the invention is illustrated. The ball valve opens automatically when the can is screwed on the gun's adapter. The teethed partial disk 20 engages a transverse rotating member and pivot itself about the pivot 22 of a ball valve. The rotating member 21 is driven by the screwing of the can + ring on the gun's adapter.

[0023] In FIG. 13 The only difference is the can handle 1.

In this concept the handle is causing the sliding of the safety member 9. When the user wants to put a can on the gun, he has still to slide the safety memeber in the other position. However in this embodiment, this is achieved not by using a push button 13 (by hand) as in the previous design, but preferably by pushing, then releasing, the can 10 against the can handle 30 during the process of attaching the can to the gun.

Claims

1. An improved dispensing gun said gun comprising in combination a product inlet passage and an oulet passage, the inlet passage comprising a basket for adapting a pressurized can and a ball valve,
characterised in that there is provided a safety feature consisting in a member slidable under the basket, which will prevent, in normal operation, the handle of the ball valve of being in an open position in the absence of a can affixed on said basket.

2. The gun according to claim 1 wherein the handle axle (11) of the ball valve (1) has a non-circular cross-section and can be freely turned only when it traverses a longitudinal slot (10), provided on the longitudinally slidable member (9) which is biased by a spring (16) , in a particular postion of such member (9), that is to say a position where the handle axle (11) matches an enlargement (12) of the slot (10) width, so that rotation of the handle (2) for opening the intlet passage is allowed, said position being determined by a contacting or engaging part (15) of said safety member (9) lateraly pressing or engaging the ring-can assembly (5, 6) affixed to said basket (2).

3. The gun according to claim 1 or 2 wherein the cross section of the handle axle is rectangular.

4. The gun according to claim 1 or 2 wherein the cross section of the handle axle is a parallely bi-truncated circle.

5. An adapter for assembling a pressurized can to a gun comprising a ball valve and a safety member wherein the safety member is a slidable member which will prevent, in normal operation, the handle of the ball valve of being in an open position in the absence of a can adapted on said basket.

6. An improved dispensing gun said gun comprising in combination a product inlet passage and an oulet

passage, the inlet passage comprising a basket for adapting a pressurized can and a ball valve,
characterised in that there is provided a safety feature consisting in a member slidable under the basket, which a means which will force, in normal operation, the handle of the ball valve of being in a closed position in the absence of a can adapted on said basket.

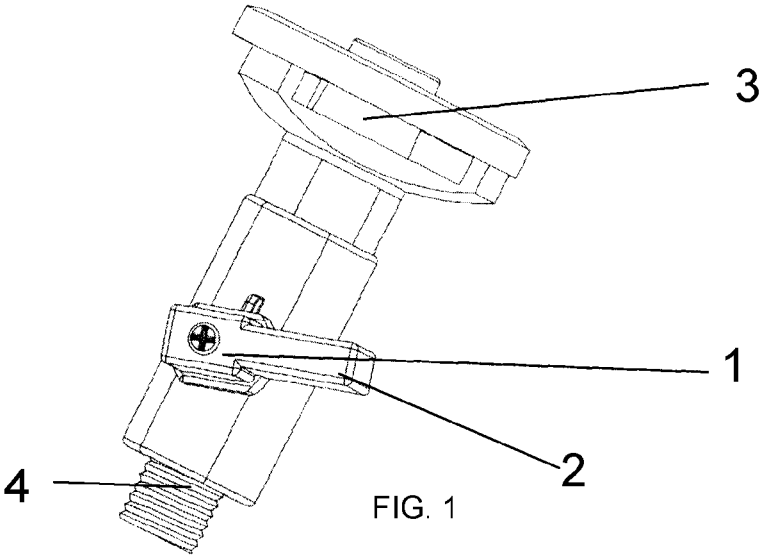


FIG. 1

PRIOR ART

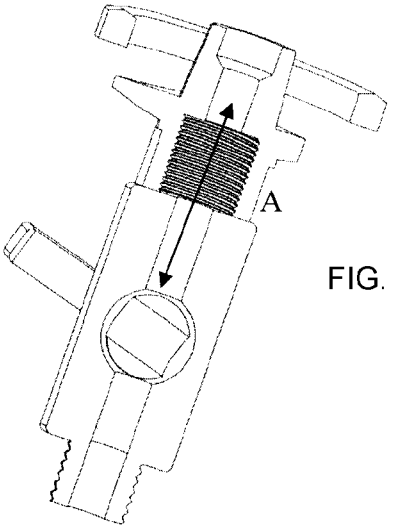


FIG. 2

PRIOR ART

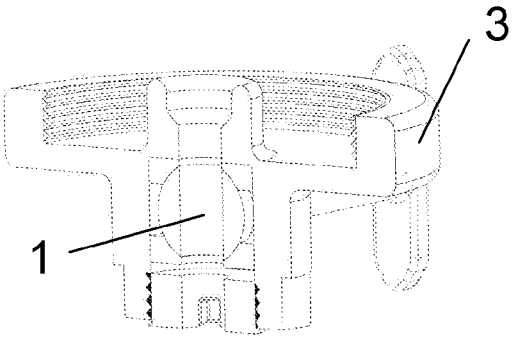


FIG. 3

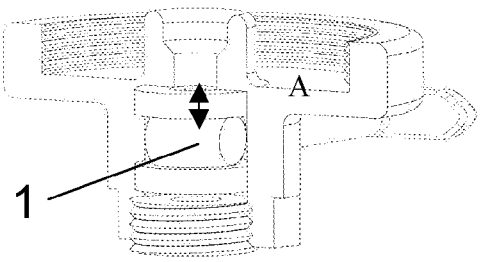


FIG. 4

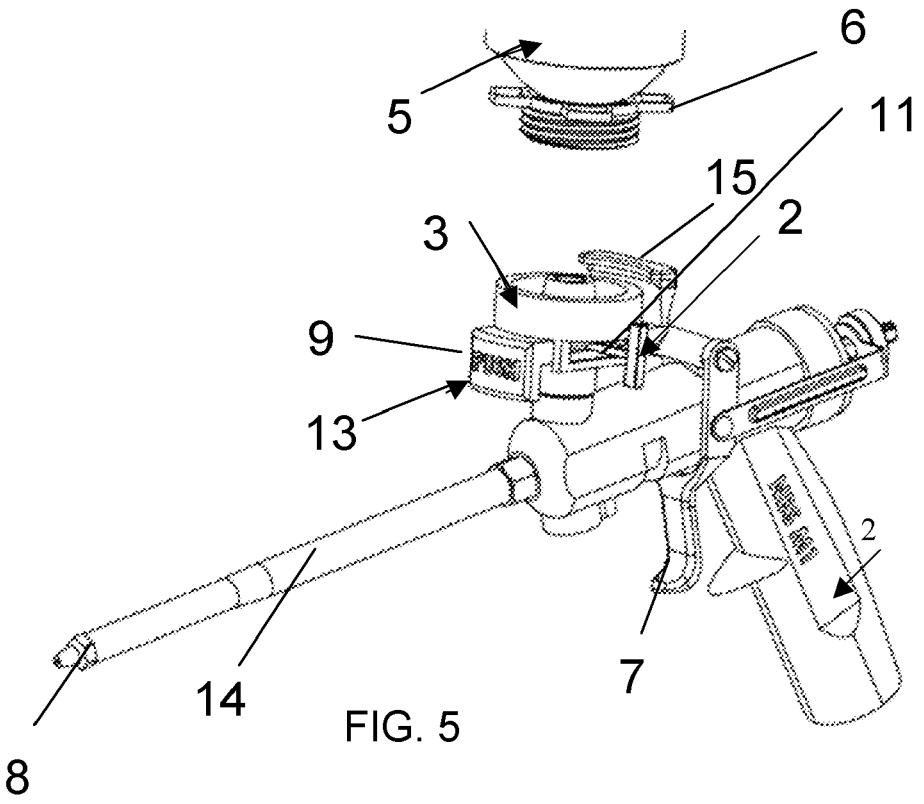


FIG. 5

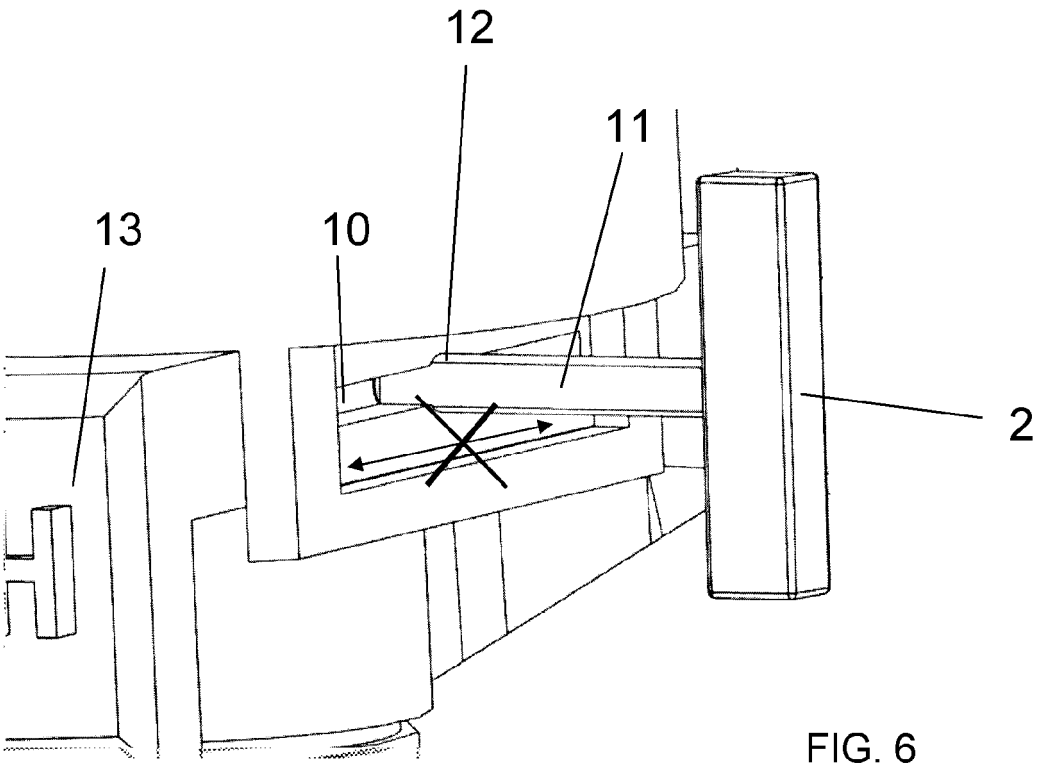


FIG. 6

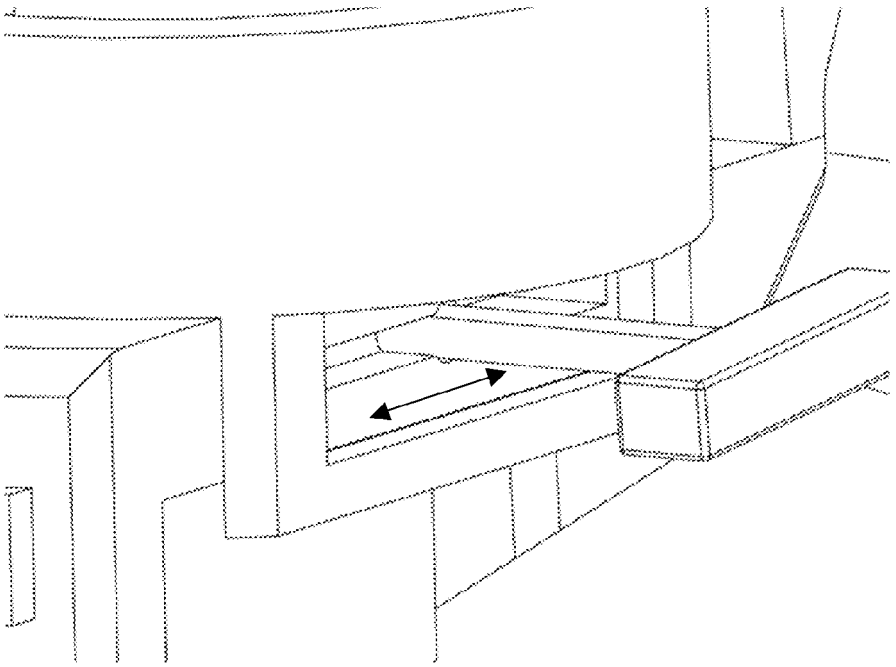


FIG. 7

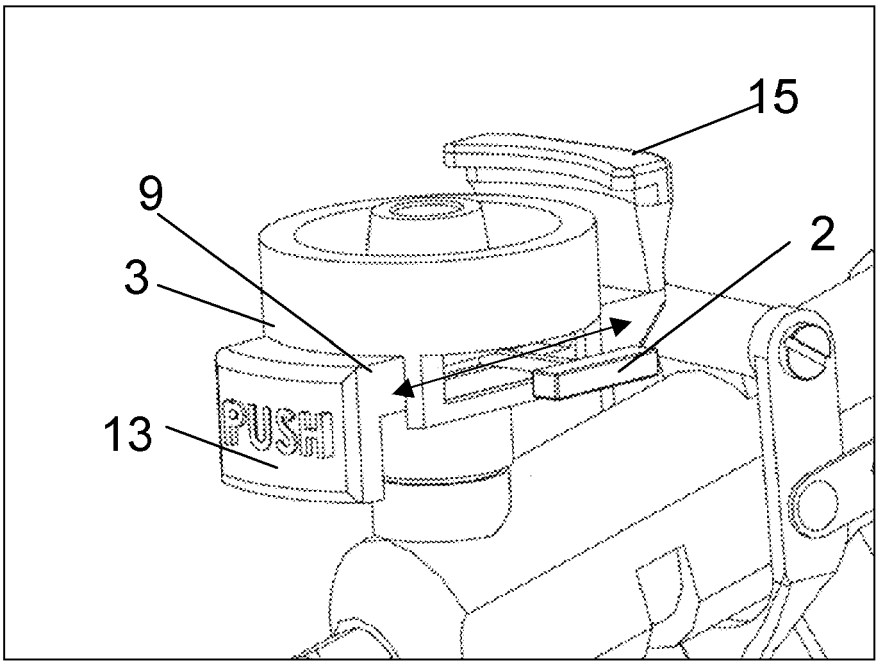


FIG. 8

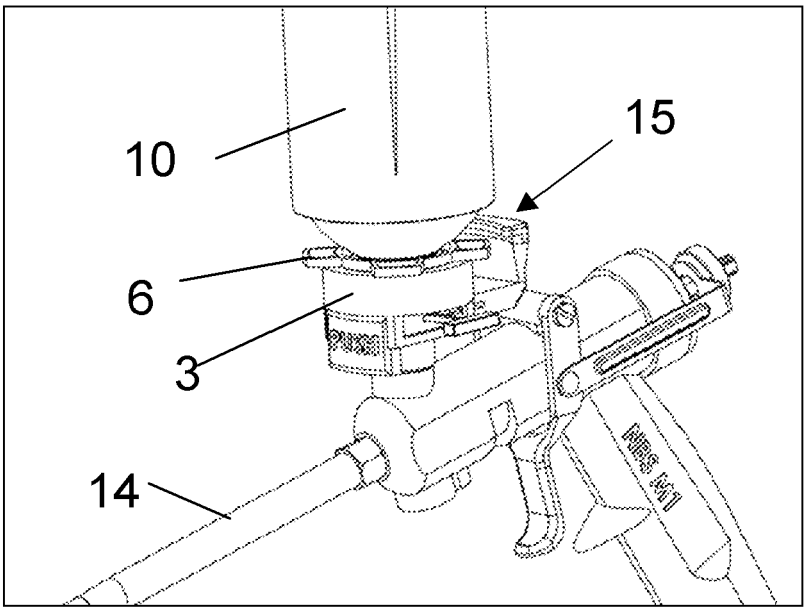


FIG. 9

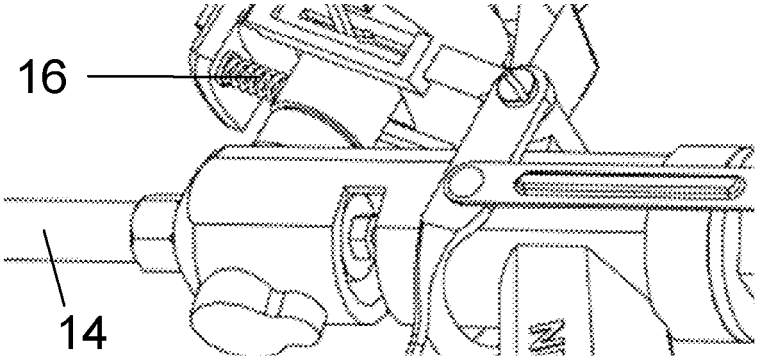


FIG. 10

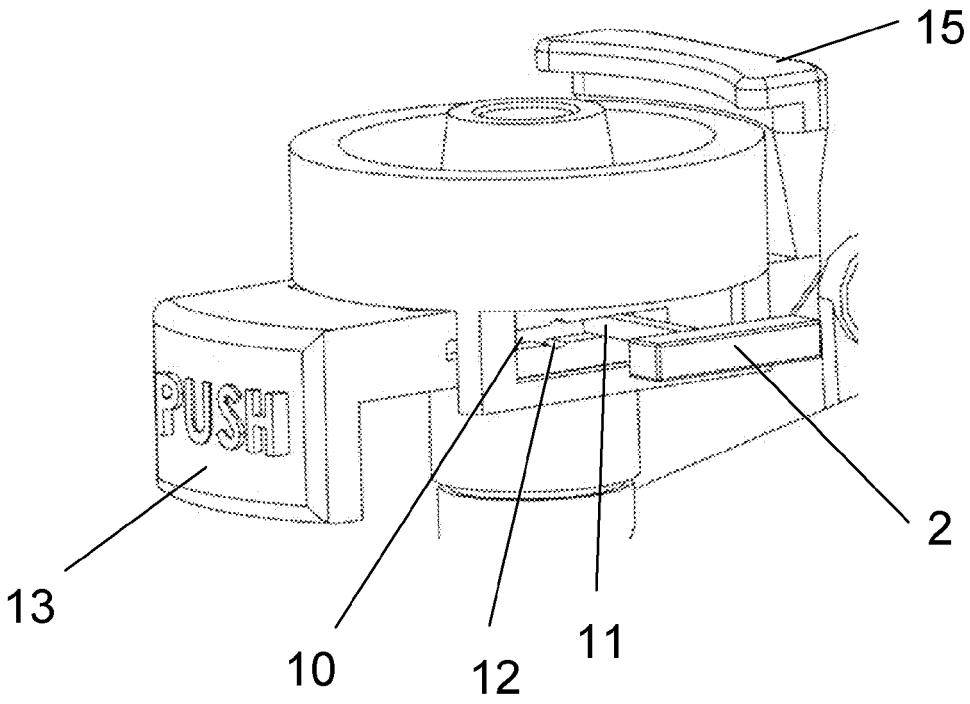


FIG. 11

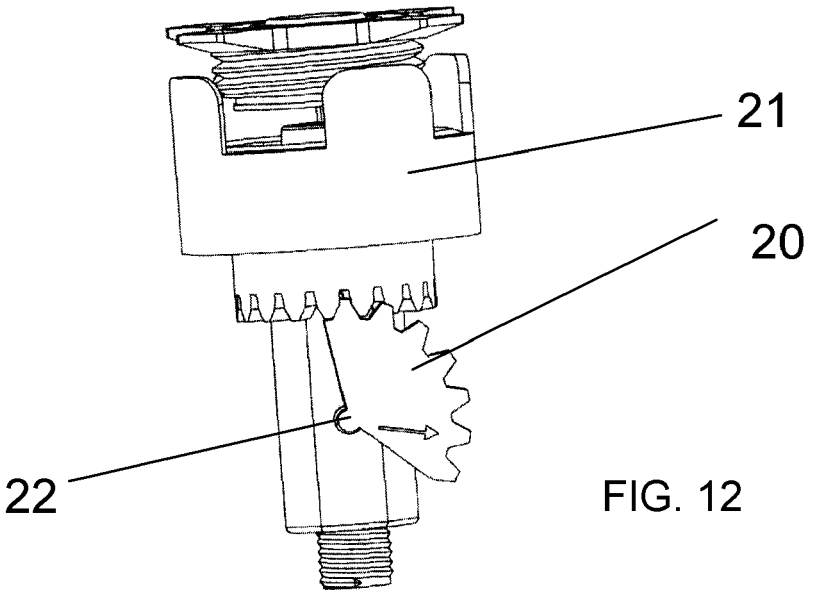


FIG. 12

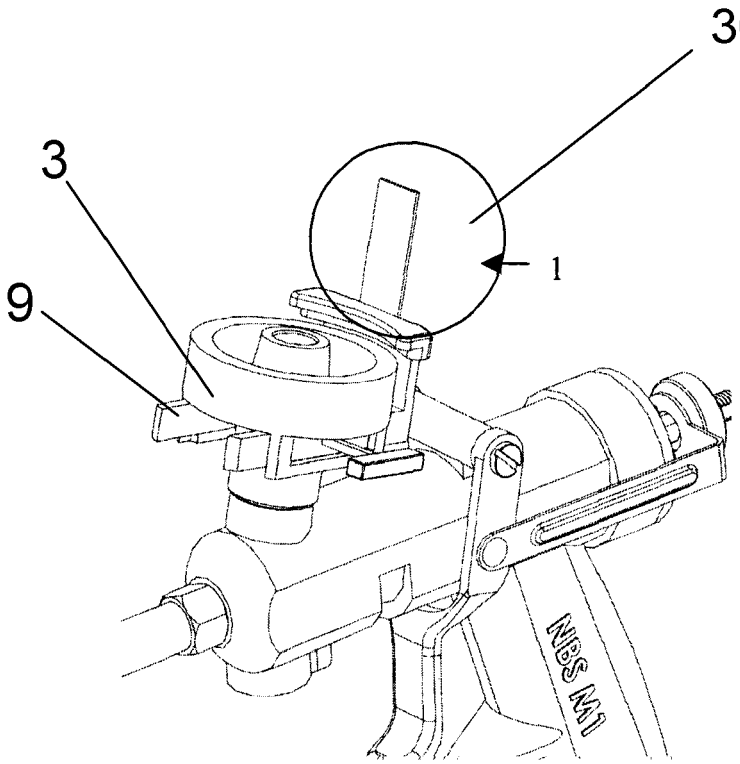
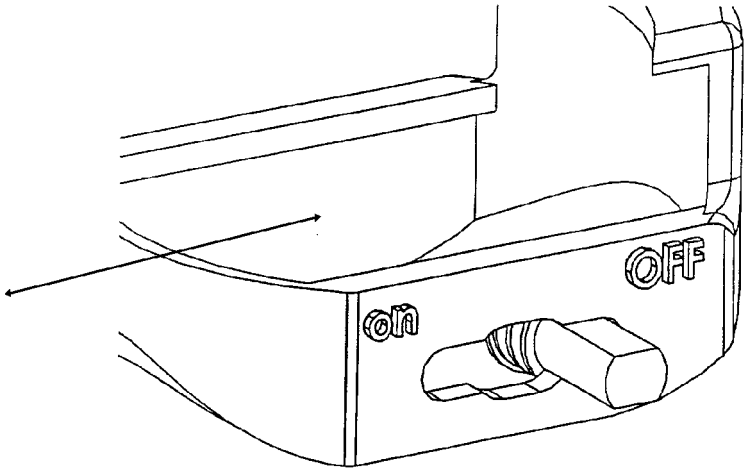


FIG. 13



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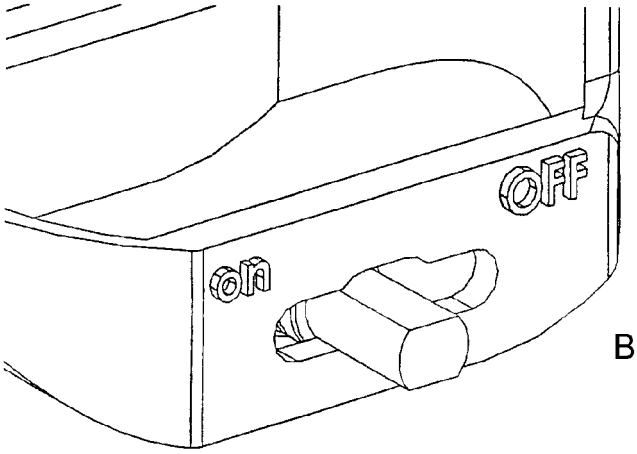

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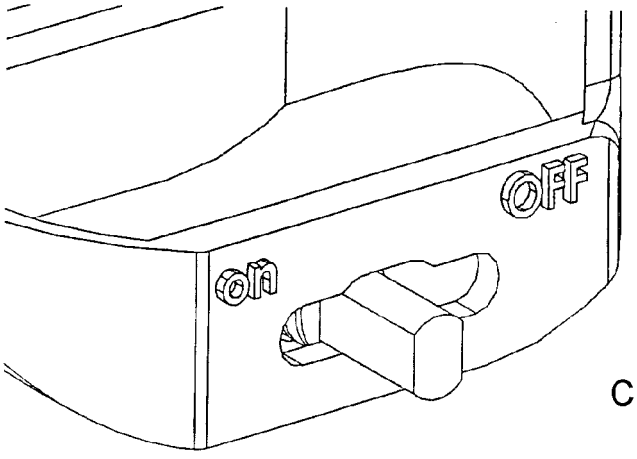
FIG. 14



C

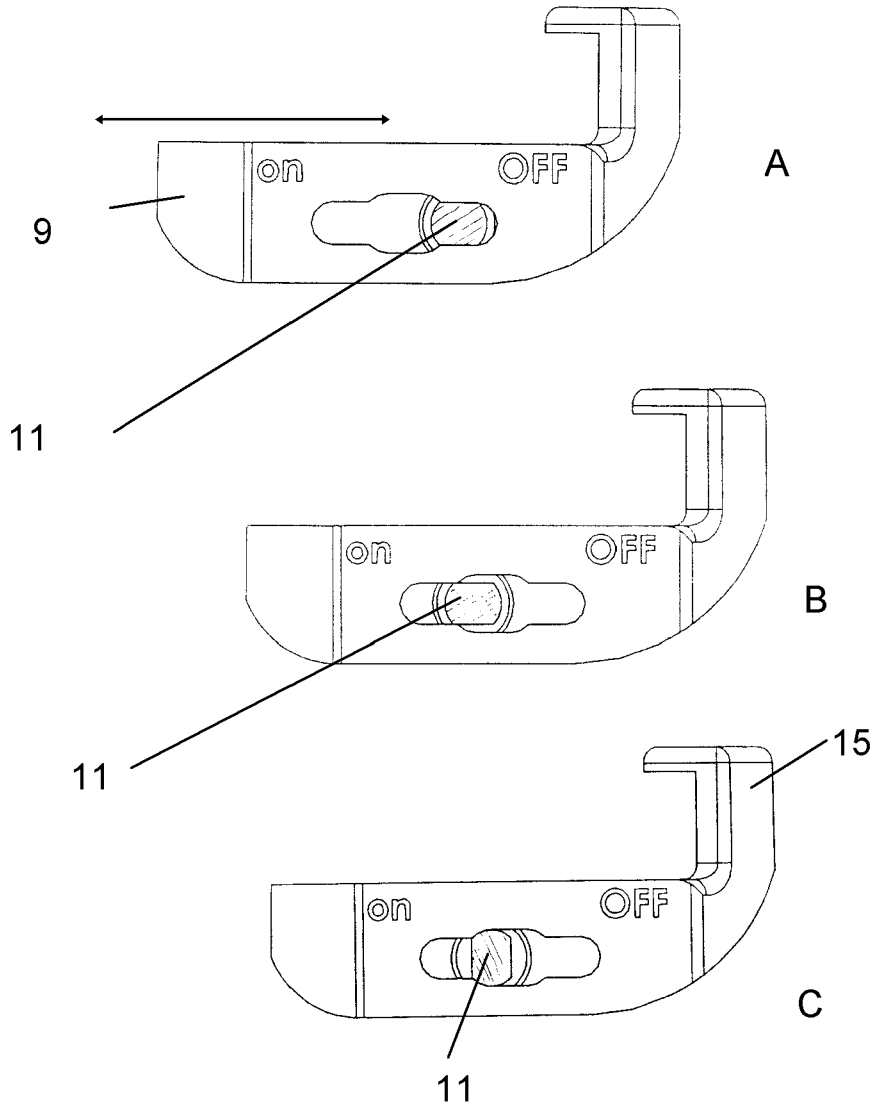


FIG. 15

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 08 10 0295

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 98/43894 A (SOUDAL [BE]; SCHRAVEN JOHN [NL]) 8 October 1998 (1998-10-08) * page 6, lines 4-11 * * page 7, lines 3-7 * * page 8, lines 23-25 * * page 9, lines 3-18; claim 1; figures * -----	1,5,6	INV. B05B9/08 B65D83/16 F16K35/02

TECHNICAL FIELDS SEARCHED (IPC)

F16K
B65D
B05B
B01F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	5 March 2008	Endrizzi, Silvio

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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L : document cited for other reasons

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 08 10 0295

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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