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## (54) Foam or fluid dispensing gun supplied by pressurised can

(57) The invention discloses a dispensing gun (1) for foams, adhesives or sealants comprising a dispensing tube (2) and a trigger (6) for actuating a gun needle (7) able to open the end of said dispensing tube (2) for dispensing the fluid. The gun (1) is coupled to a pressurized can (4) and is provided with an opening and closing mechanism of the pressurized can (4) relative to the dispensing tube (2). Closing and opening is achieved by the concomitant movement of said gun needle (7) for delivering the foam. The closing and sealing mechanism includes a protruding insert (38) or lowering cog provided or mounted on the sliding gun needle (11), said needle traversing an adaptor needle (12).

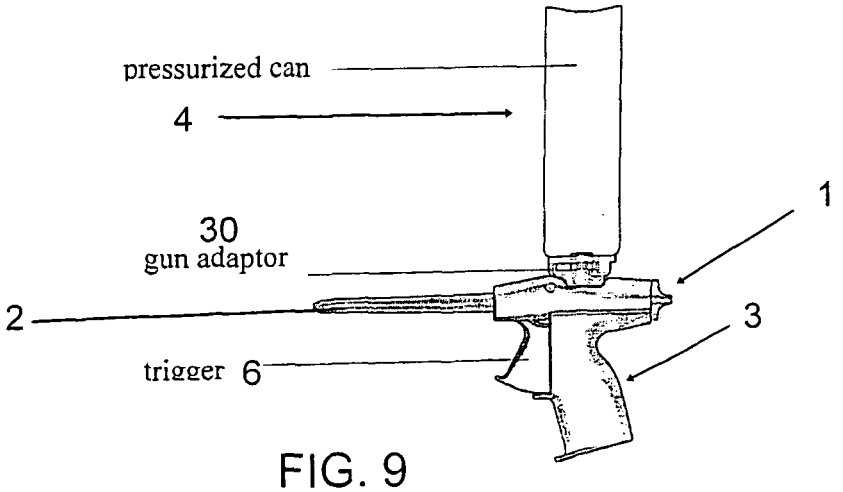


FIG. 9

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## Description

**[0001]** The present invention concerns a design improvement to a dispensing gun for dispensing of one or two component polyurethane (PU) foam systems, adhesives, sealants, etc.

THE PRIOR ART

**[0002]** The dispensing guns presently available suffers from a variety of drawbacks. For example the emptying of the can is not complete because the pressure in the can is used for opening a valve system and this pressure is decreasing with the use time of the can. For the same reason a strong spring to provide a perfect desirable sealing, and thus a better barrier against moisture penetration from the outside, cannot be used because such will provoke a pressure loss and will interrupt the delivery of foam at a still earlier stage before complete emptying of the can or vessel.

**[0003]** According to the prior art, generally the gun adaptor is an auxiliary part mounted onto a dispensing gun for dispensing of one or two component polyurethane (PU) foam systems, adhesives, sealants, etc. This auxiliary part assures/facilitates the connection of the pressurized can or vessel onto the dispensing gun and at the same time assures the sealing when the pressurized can is disconnected (see fig. 1).

**[0004]** More particularly, the traditional EA gun adaptor consists out of an adaptor ring and ball + spring mechanism which assures the opening/closing and sealing of the gun adaptor. The opening of this ball + spring mechanism is forced by the pressure in the can.

**[0005]** The fluid then has access to the delivering tube which is closed at his end by the end of a coaxial needle and which may be triggered back to dispense the fluid.

**[0006]** When the pressure in the can becomes insufficient to compress the spring, the valve isn't opening anymore. To reduce the opening force a relative weak spring is used. Due to this weak force the sealing of the ball onto the conical sealing surface (basket) is weak as well. When the dispensed product is a moisture sensitive product, the moisture can penetrate between the conical sealing surface and the ball which can lead to a sticking of the ball onto the conical sealing surface.

**[0007]** A significant improvement is obtained with a new design gun adaptor according to the present invention.

**[0008]** With this gun adaptor the opening and closing of the adaptor is integrated in the trigger movement of the gun and is thus independent on the pressure in the can.

THE INVENTION

**[0009]** The invention provides a new gun adaptor design with the following advantageous features:

1. Opening and closing of the gun adaptor is integrated in the gun needle and trigger movement of the dispensing gun.
2. Due to the fact that the opening of the gun adaptor is made independent on the pressure in the can or vessel there is no pressure loss in the whole system, which means that lower end pressure in the can is reached leading to a more efficient emptying of the can.
3. Due to the presence of a stronger spring a better sealing of the ball or needle onto the conical sealing surface of the gun adaptor is obtained.
4. When a design seal is used the sealing and closing functions of the gun adaptor are combined with a gun needle backseal function.

**[0010]** Furthermore an improved ergonomics is being provided.

**[0011]** Indeed according to one aspect, the pressurized can is placed perpendicular to the handgrip. According to another aspect the trigger is a full surface trigger preventing the fingers from being pinched while using the gun.

**[0012]** The invention will be better understood by the following description of the attached drawings provided in an exemplative way only.

Fig 1a and 1b are general views of a dispensing gun of the prior art and according to the invention respectively,

Fig. 2a and 2b show in sectional view the detail of the gun adaptor of Fig. 1a in open and closed positions

Fig. 3a and 3b show a partial view of one embodiment of the gun according to the invention, respectively in closed and open position

Fig. 3c is an enlargement in perspective of a part of Fig 3b,

Fig. 4 illustrates another aspect of the invention;

Fig. 5 shows an embodiment of the invention with ball/spring mechanism

Fig. 6 is another embodiment with a cup-type sealing element

Fig. 7 is yet still another embodiment with a cylindrical seal

Fig. 8 illustrates the use of a double O-ring.

Fig. 9 shows the new design of a gun adaptor according to the invention

**[0013]** Fig. 1 is a gun 1 according to the prior art with a delivering tube 2, a co-axial internal gun needle 7, a handle 3, a pressurized can 4, a gun adaptor 5, and a trigger 6 actuating a backward movement of the gun needle 7 inside the tube in order to deliver the fluid at the output end 8.

**[0014]** Fig. 2a and 2b illustrate in more detail the gun adaptor 20 according to the prior art. There is a adaptor ring 9 which form a seat for a ball 10 pressed by a spring

11. The opening of the spring and ball mechanism is forced by the pressure in the can, and the fluid may then reach the dispensing tube awaiting to be dispensed by the trigger mechanism.

**[0015]** Figs. 3a and 3b represent schematically a view of the adaptor according to the invention, closed or open respectively.

**[0016]** The adaptor 30 is opened indirectly by the gun needle 37 and trigger 36 movement. The latter pushes down an "adaptor needle" 12 against the resistance of a spring 11.

**[0017]** To open the adaptor the gun needle 7 is drawn backwards horizontally by the gun trigger movement.

**[0018]** By means of a transfer mechanism (here a triangular insert 38 mounted on the gun needle and traversing the adaptor needle 12), at the same time the adaptor needle is drawn downwards vertically.

**[0019]** In closed position (Fig. 3a) the spring will assure accurate closing of the adaptor needle onto the conical sealing surface of the adaptor ring. In this case a stronger spring can be used, giving a better sealing of the gun adaptor.

**[0020]** Fig. 3c is an enlargement in perspective showing the insert on the needle traversing the adaptor needle in the open position.

**[0021]** Fig. 4 illustrate a design of the adaptor needle 12.

To facilitate the evacuation of the content of the pressurized can the design of the adaptor needle is foreseen with longitudinal grooves or cavities 13.

**[0022]** Fig. 5a and 5b illustrate another example of a gun adaptor based on the same opening/closing principle forced by the gun needle and trigger movement.

**[0023]** In this embodiment the adaptor needle is replaced by a ball 51. In closed position (left picture) the present spring will assure accurate contact of the ball onto the conical sealing surface of the adaptor ring. The gun needle connection means 55 is also shown.

**[0024]** Other examples of a gun adaptor based on the same opening/closing principle forced by the gun needle and trigger movement are shown in fig. 6, fig. 7 and fig. 8. The corresponding adaptor rings are not shown.

**[0025]** In these embodiments the sealing and closing functions of the adaptor are taken over by a design seal that is to say a cup seal in Fig. 6, a cylindrical seal in Fig. 7 and a double O-ring in Fig. 8.

**[0026]** In closed position (left picture) the pre-tension of the used seals will assure accurate closing and sealing of the adaptor.

**[0027]** In open position (right picture) the seals will also assure the backseal function for the gun needle.

**[0028]** Fig. 9 shows a new more ergonomic design of the gun , which is permitted by the new mechanism of the invention. The pressure can 4 is located above the handle 3, no more offset along the dispensing tube. Furthermore the trigger 6 is a plain surface trigger and therefore prevents the fingers from being pinched while actuating the gun.

## Claims

**1.** A dispensing gun (1) for foams, adhesives or sealants comprising a dispensing tube (2) and a trigger (6) for actuating a gun needle (7) able to open the end of said dispensing tube (2) for dispensing the fluid, said gun (1) being able to be coupled to a pressurized can (4) **characterized in that** there is provided an opening and closing means of the pressurized can (4) relative to the dispensing tube (2) which is achieved by the concomitant movement of said gun needle (7).

**2.** Dispensing gun according to claim 1 comprising an adaptor ring (9) for connection with the pressurized can (4).

**3.** Dispensing gun according to claim 1 or 2 wherein the adaptor ring (9) comprises an adaptor needle (12) and a spring (11) pressed ball (10) for sealing the connection of the pressurized can (4) and the tube (2) of the dispensing gun.

**4.** Dispensing gun according to any of the previous claims wherein the closing and sealing mechanism includes a protruding insert (38) or lowering cog provided or mounted on the sliding gun needle (11), said needle traversing the adaptor needle (12).

**4.** Dispensing gun according to any of the previous claims wherein the adaptor needle (12) has longitudinal grooves or cavities (13) to facilitate the evacuation of the content of the pressurized can.

**5.** Dispensing gun according to claim 1 or 2 wherein the opening and closing means comprises a ball and spring system located in a element connected to the translating gun needle, said ball being able in the closed position of said needle to seal the adaptor opening.

**6.** Dispensing gun according to claim 1 or 2 wherein the sealing and closing functions of the adaptor are taken over by a cup seal (60).

**7.** Dispensing gun according to claim 1 or 2 wherein the sealing and closing functions of the adaptor are taken over by a cylindrical seal (70).

**8.** Dispensing gun according to claim 1 or 2 wherein the sealing and closing functions of the adaptor are taken over by a double O-ring (80).

**9.** Dispensing gun according to any of the previous claims wherein the pressure can (4) is located vertically above the handle (3).

**10.** Dispensing gun according to any of the previous

claims wherein the trigger is a plain surface trigger.

**11.** Dispensing gun according to any of the claims 6 to 9 wherein the sealing and closing functions of the gun adaptor are combined with a gun needle back-seal function.

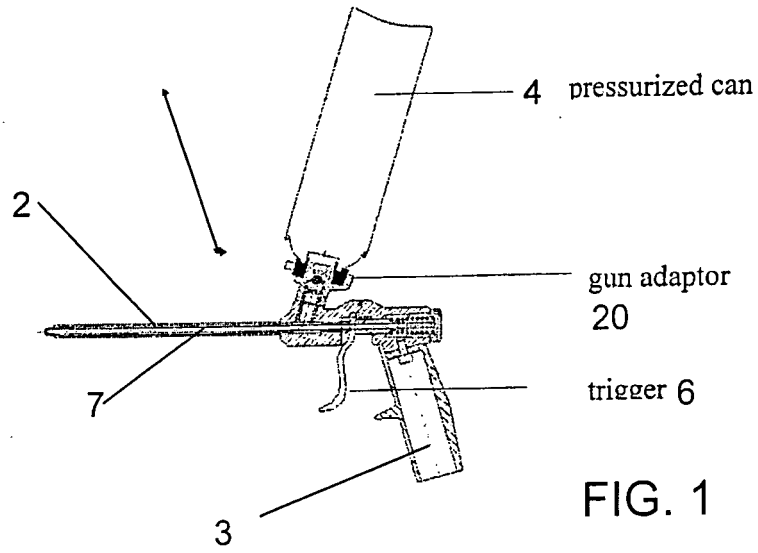


FIG. 1

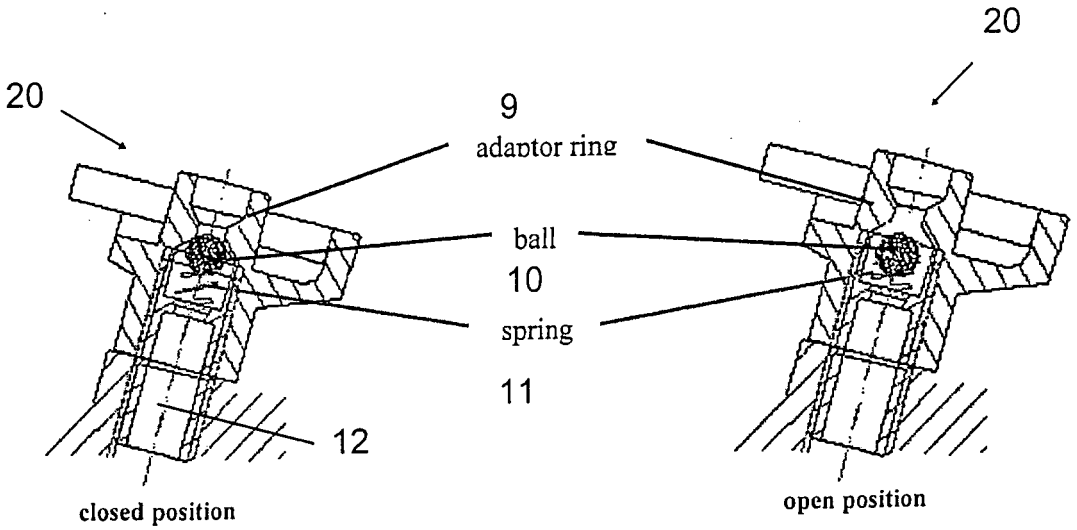


FIG. 2a

FIG. 2b

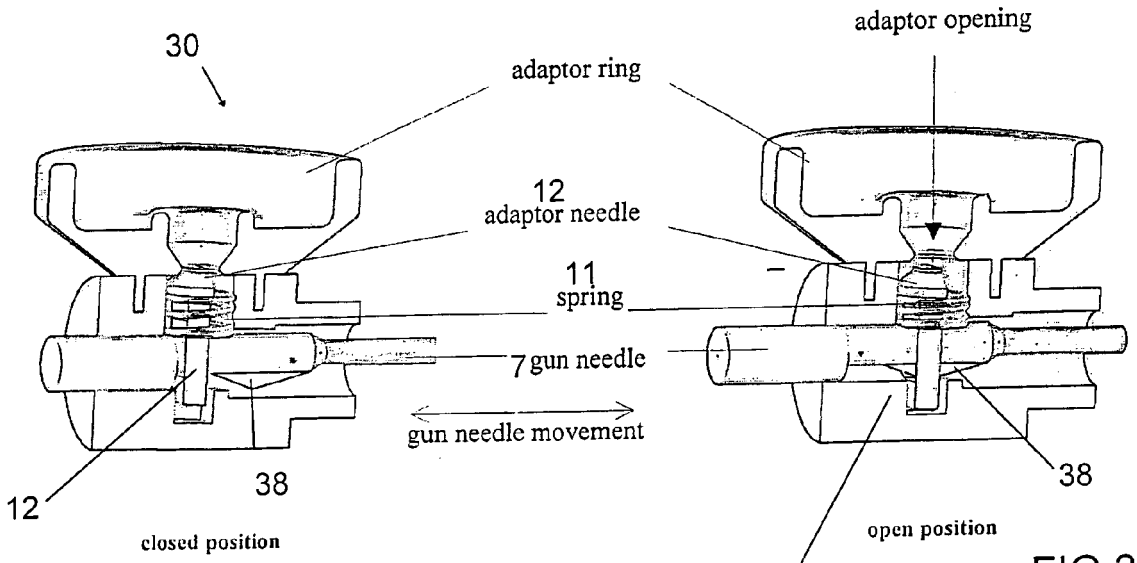


FIG. 3a

FIG 3b

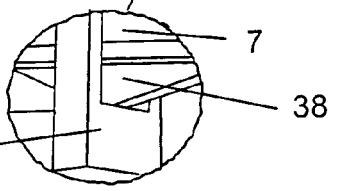


FIG 3c

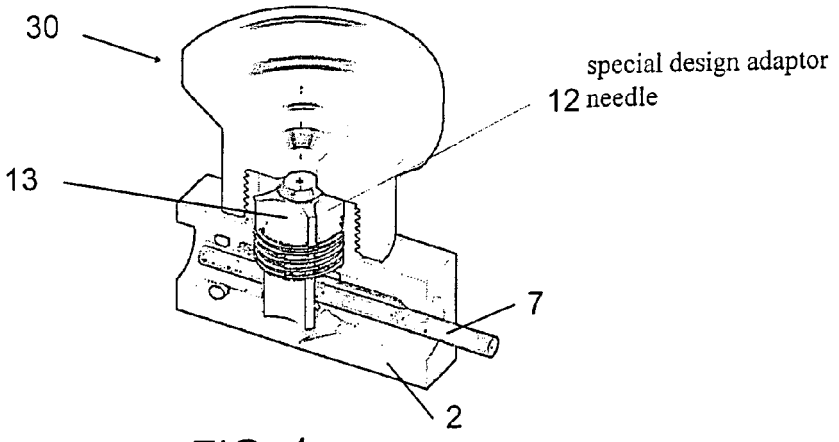


FIG. 4

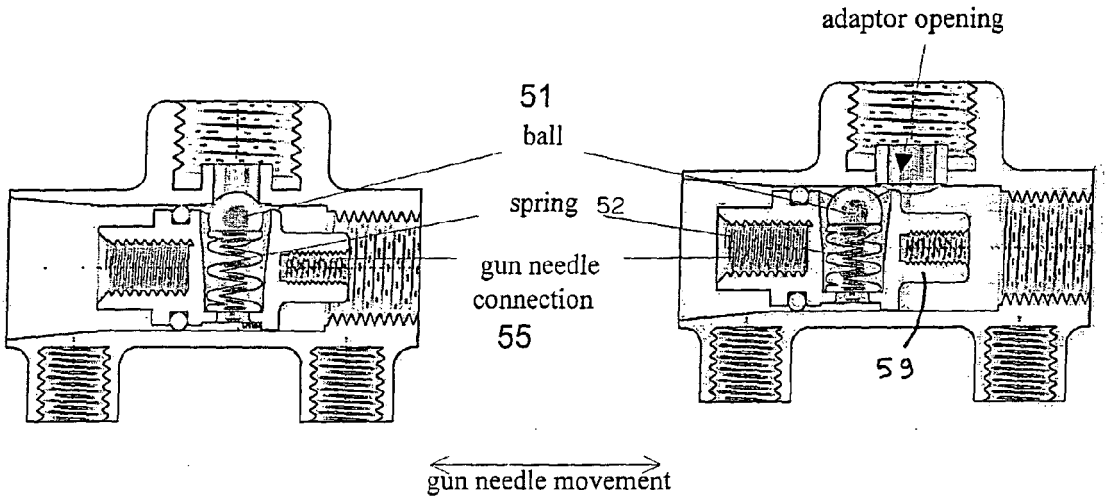


FIG. 5a

FIG. 5b

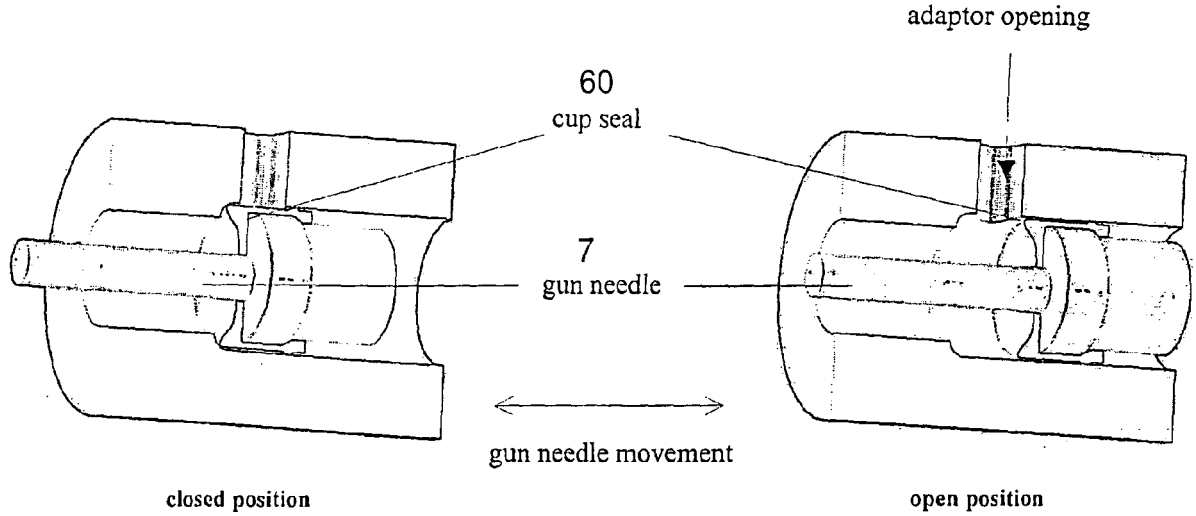


FIG. 6a

FIG. 6b

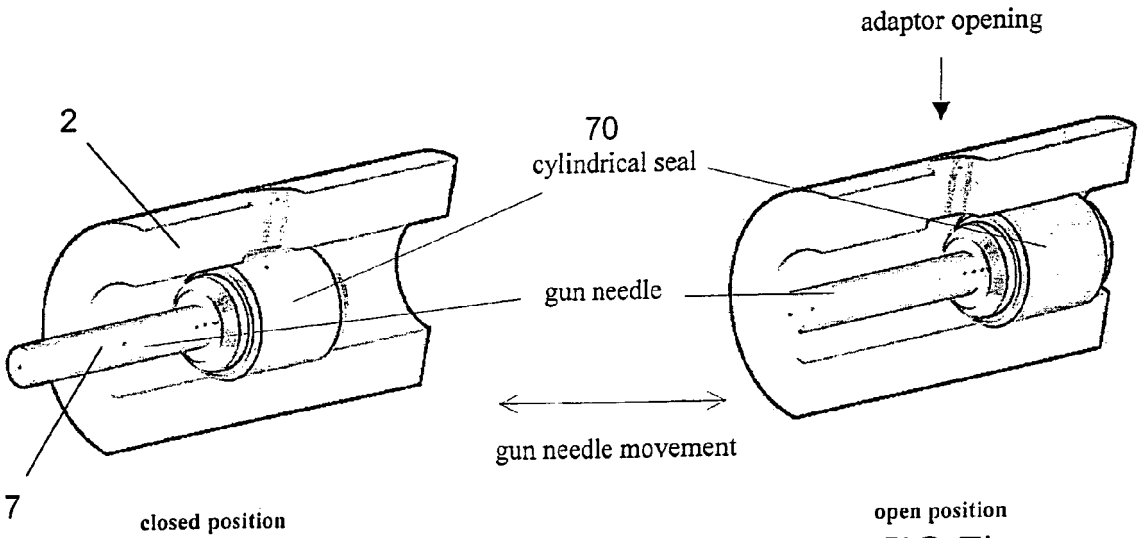


FIG. 7a

FIG 7b

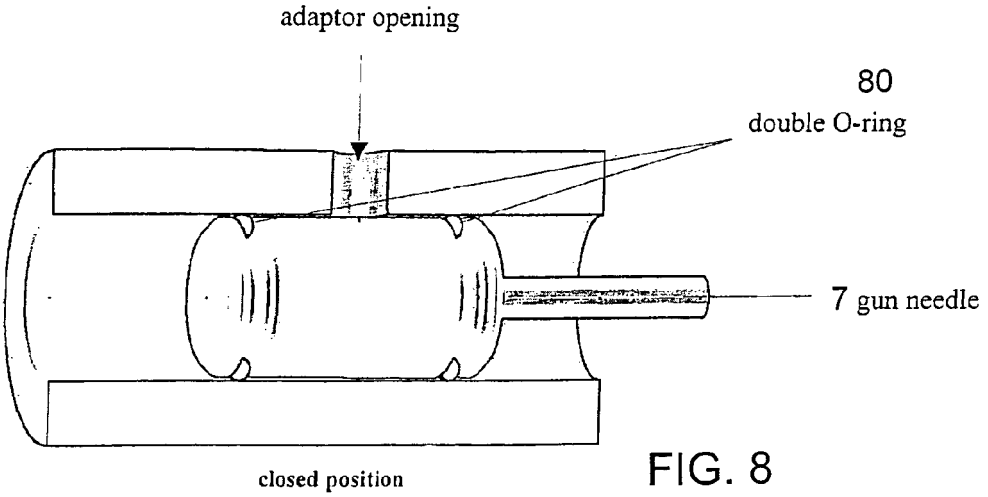


FIG. 8

Fig. 8

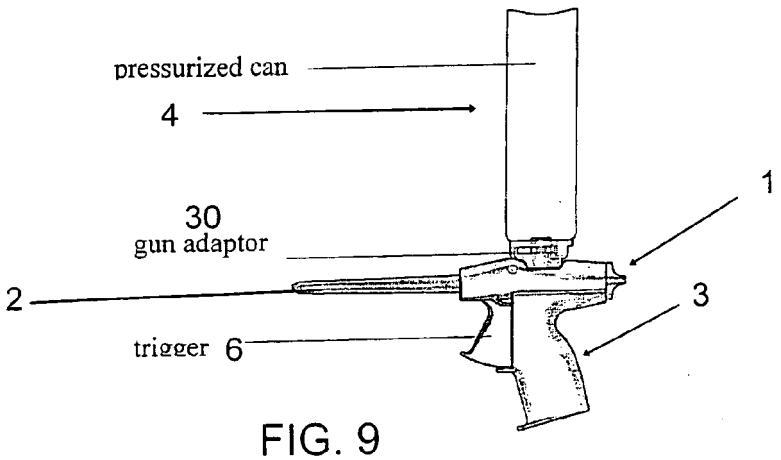


FIG. 9

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# EUROPEAN SEARCH REPORT

Application Number
EP 04 07 7875

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B05B
B65D
B05C

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
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| Munich | 18 March 2005 | Innecken, A |

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## ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 04 07 7875

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