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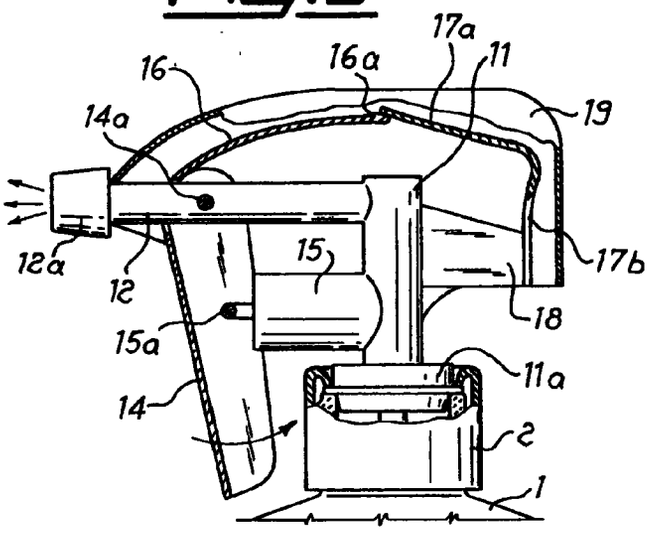
(54) Device for delivering fluids contained in bottles, comprising a rigid body and resilient means which are integral with said body and designed to reset the device after delivery

(57) Device for delivering fluids contained in bottles (1) or the like, comprising a rigid body (10) inside which the pipes for sucking up (11) and directing (12) the said fluid are formed and to which the means (14) for operating a piston (15,15b,15c) delivering the fluid are hingeably connected, there being provided resilient means (17;117;217) integral with the body (10) itself and designed to interfere with a part (16;116;216) of said operating lever (14) so as to cause the return movement of the latter into the rest position after operation thereof for delivery.

Fig.5



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Description

The present invention relates to a device of the gun type for the delivery of fluids contained in bottles or the like, which comprises a rigid body in which the pipes for emission of the liquid are formed and to which an operating lever for delivery is hingeably connected, there being provided resilient means integral with the body itself and designed to interfere with a part of said operating lever so as to cause the return movement of the latter into the rest position after operation thereof for delivery.

It is known in the technical sector relating to the packaging of products to be delivered by means of spraying or atomization that there is the need to seal the bottle containing the product, by means of caps or tops incorporating the delivery means which normally consist of a pumping piston and a delivery pipe, the external end part of which consists of a nozzle of suitable cross-section.

It is also known that said caps or tops include gun-type sprayers (also called triggers) which, although they are constructionally made in different ways, are all based on the operation of a piston by means of a lever, called a trigger, which is hingeably mounted on the body of the cap or top and which, pushed by the user to the end-of-travel position, causes an increase in the pressure inside the bottle and hence drawing up of the product along the delivery pipe and the forced emission of said product through the said nozzle.

The operating lever is then brought back into the rest position by a resilient element, normally consisting of a steel spring, which resets the device for the next delivery.

It is also known that there is a growing demand for the manufacture of gun-type delivery devices made entirely of plastic, so as to be able to recycle the entire cap or top, and from this point of view the presence of the steel spring represents a major limitation since its removal is necessary prior to recycling of the plastic.

The technical problem which is posed, therefore, is that of providing a gun-type delivery device which is made entirely of plastic and can be recycled, without additional parts made of material different from the basic recyclable material.

Within the scope of this problem a further requirement is that the delivery device should be made with a small number of parts which are integral with one another and can be manufactured directly using a moulding process, without the need for assembling accessory parts which could cause accidental breakages or separation and which, in any case, require an assembly stage.

These technical problems are solved according to the present invention by a device for delivering fluids contained in bottles or the like, comprising a rigid body in which the pipes for drawing in and directing the said fluid are formed and to which the means for operating a piston delivering the fluid are hingeably connected, there being provided resilient means which are integral with the body itself and designed to interfere with a part of said operating lever so as to cause the return movement of the latter into the rest position after operation thereof for delivery.

Further details may be obtained from the following description of a non-limiting example of embodiment of the invention, provided with reference to the accompanying drawings in which:

Figure 1 shows a partially sectioned side view of the gun according to the invention in the rest position;

Figure 2 shows a cross-section along the plane indicated by II-II in Fig. 1;

Figure 3 shows a cross-section along the plane indicated by III-III in Fig. 1;

Figure 4 shows a cross-section along the plane indicated by IV-IV in Fig. 1;

Figure 5 shows a cross-section similar to that of Fig. 1 with the lever at the end of its delivery travel;

Figures 6a,6b show a variation of an example of embodiment of the gun according to the invention in the rest condition and delivery condition, respectively; and

Figure 7 show a further example of embodiment of the gun according to the invention.

As illustrated, the gun-type delivery device according to the invention comprises a rigid body 10 which is obtained by means of moulding or a similar process and which comprises: the pipes for drawing up 11 and directing 12 the fluid to be delivered, a cylinder 15 substantially parallel to the said directional pipe 12, a gusset 18 integral with the drawing-up pipe 11, but extending on the opposite side with respect to the directional pipe 12, and a rib 17 integral with said gusset 18.

More particularly, one end of the drawing-up pipe 11 is integral with an annular element 11a sealingly connected, by means of a cap 2, to the neck of fluid container 1.

The said rib 17 consists of a first section 17b integral with the gusset 18 and substantially parallel to the drawing-up pipe 11 and a second section 17a which is free and substantially perpendicular to said drawing-up pipe 11 so as to form a means reacting resiliently to the deformation imparted by the trigger of the gun, as will emerge more clearly below.

Two pins 14a substantially perpendicular to the said pipe extend from the external surface of the exit pipe 12 and receive, hingeably mounted on them, the lever 14

forming the trigger of the gun.

Said lever 14 in turn has, in a suitable position, a pin 15a on which the rod 15b of a pumping piston 15c is hingeably mounted and which, being displaced inside the cylinder 15, causes an increase in pressure inside the pipe 11 and hence the bottle 1 and the consequent delivery of the fluid through the pipes 11,12 and the end nozzle 12a of the directional pipe 12.

Since these pumping means are known per se, they are not described in detail.

As can be seen from the illustrations, the end of the operating lever 14 is joined to the directional pipe 12 and extended by a lug 16 forming a substantially obtuse angle with the lever 14 itself.

The free end 16a of said lug 16 is engaged with the substantially horizontal section 17a of the rib 17 so that said free part 17a of the rib 17 reacts resiliently to the deformation imparted by the lug 16 which is integral with the lever 14, when the latter (Fig. 4) is made to rotate in an anti-clockwise direction so as to cause pushing of the piston 15c and consequent delivery of the fluid.

The delivery device may be completed by an aesthetically finished protective casing 19 which has substantially the shape of an "overturned U" (Fig. 2) fitted in a known manner to the gun.

As shown in Figure 6a, both the lug 16 integral with the lever 14 and the rib 17, forming the resilient reaction means, may have different configurations.

The lug 116, integral with the lever 14, may in fact be prolonged in the opposite direction to that of the delivery nozzle 13 and have a free end 116a bent so as to engage with the rib 117, the fixed section 117b of which, in this case, is attached to the body 10 at the top end of the drawing-up pipe 11 and extends in a substantially horizontal direction, and the free end of 117a of which is arched towards the bottom as far as the position where it makes contact with the end 116a of the lug 116.

From Figure 6b it is obvious how the resilient reaction caused by the deformation due to rotation of the lever 14 is distributed both on the free section 117a of the 117 and on the lug 116 integral with the lever 14.

Fig. 7 finally shows a further example of embodiment of the gun-type delivery device according to the invention, in which the lug 216 integral with the lever 14 instead has very small dimensions, while the free part 217a of the rib 217 is extended towards the delivery nozzle 13 so as to ensure interference with the lug itself. In this case the lug 216 is rigid.

It is therefore obvious how the body of the delivery gun according to the invention may be made with a single moulding operation during which the resilient means for the return movement of the operating lever are also manufactured, thereby making it possible to avoid the fitting, during the assembly stage, of an additional component such as a spring or the like, said fitting operation being in any case costly and also requiring programmed storage of the various parts to be assembled.

In addition to this, it is also obvious how the resilient components which cause the return movement of the trigger into the rest position may be realized either in the form of the single rib integral with the body of the delivery device or else divided up in the form of any combination of the rib itself and the lug integral with the trigger of the gun.

It may be envisaged, in any case, that the resilient reaction is also concentrated entirely on the lug of the trigger which reacts against a totally rigid rib.

Claims

1. Device for delivering fluids contained in bottles (1) or the like, comprising a rigid body (10) inside which the pipes for sucking up (11) and directing (12) the said fluid are formed and to which the means (14) for operating a piston (15,15b,15c) delivering the fluid are hingeably connected, characterized in that resilient means (17;117;217) are provided, said means being integral with the body (10) itself and designed to interfere with a part (16;116;216) of said operating lever (14) so as to cause the return movement of the latter into the rest position after operation thereof for delivery.

2. Device according to Claim 1, characterized in that said resilient means consist of a rib (17;117;217), a first part (17b;117b;217b) of which is integral with the body (10) and a second part (17a;117a;217a) of which is free to oscillate with respect to the fixed part itself.

3. Device according to Claim 1, characterized in that said fixed part (17b;217b) of the rib (17;217) is integral with a gusset (18) extending from the body (10).

4. Device according to Claim 1, characterized in that said rib (17;217) has a fixed section (17b;217b) arranged substantially parallel to the drawing-up pipe (11).

5. Device according to Claim 1, characterized in that said rib (17;217) has a free section (17a;217a) arranged substantially perpendicular to the fixed section (17b;217b).

6. Device according to Claim 1, characterized in that said rib (117) has a fixed section arranged substantially perpendicular to the drawing-up pipe (11).

7. Device according to Claim 1, characterized in that said rib (117) has a free arch-shaped section (117a).

8. Device according to Claim 1, characterized in that said part of the operating lever (14) which interferes

with the said resilient means is that opposite to the end on which the user acts.

9. Device according to Claims 1 and 8, characterized in that said part consists of a lug (16;116;216) extending towards the part of the device opposite to the delivery part.

10. Device according to Claims 1 and 9, characterized in that said lug (16;216) is substantially straight.

11. Device according to Claims 1 and 9, characterized in that said lug (116) is shaped substantially in the form of an "L" with arms forming an obtuse angle.

12. Device according to Claims 1 and 9, characterized in that said lug (16;116) is resilient.

13. Device according to Claims 1 and 9, characterized in that said lug (216) is rigid.

14. Device according to Claim 1, characterized in that it is covered by a casing (19) substantially in the form of an overturned "U" which can be fitted to the body (10).

Fig.1

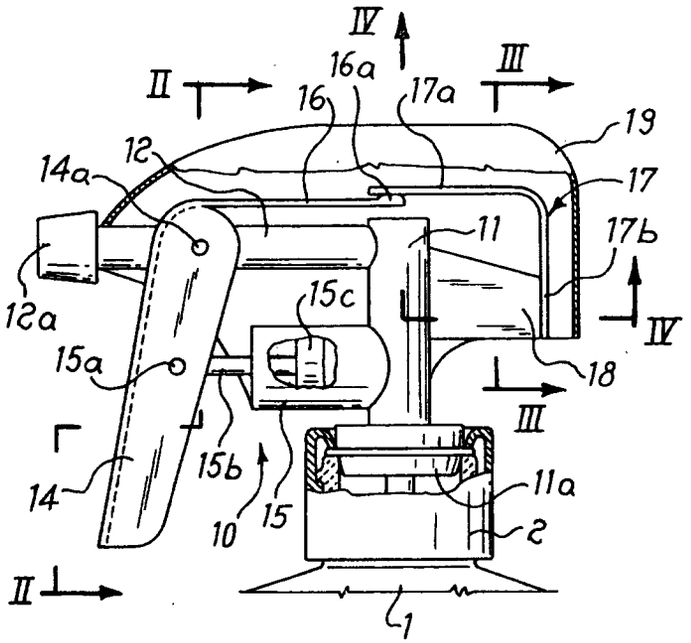


Fig.2

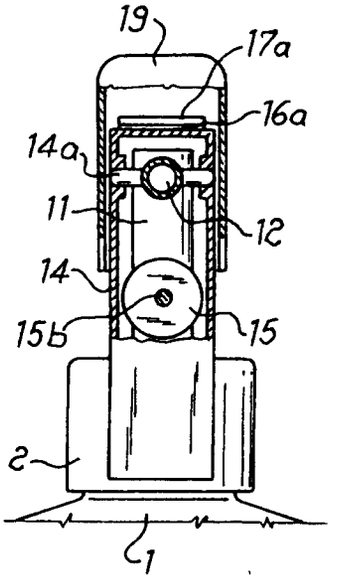


Fig.3

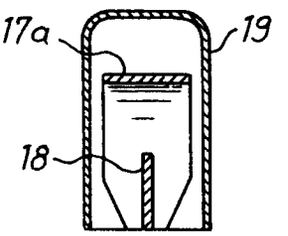


Fig.5

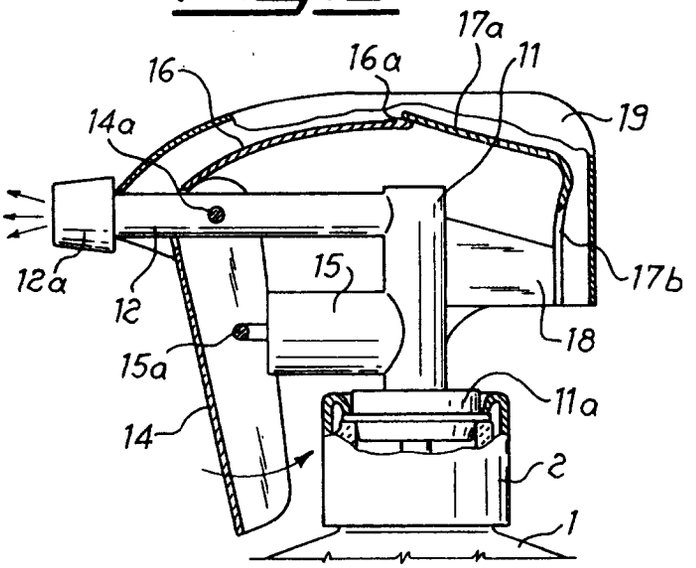
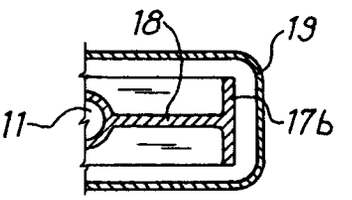


Fig.4



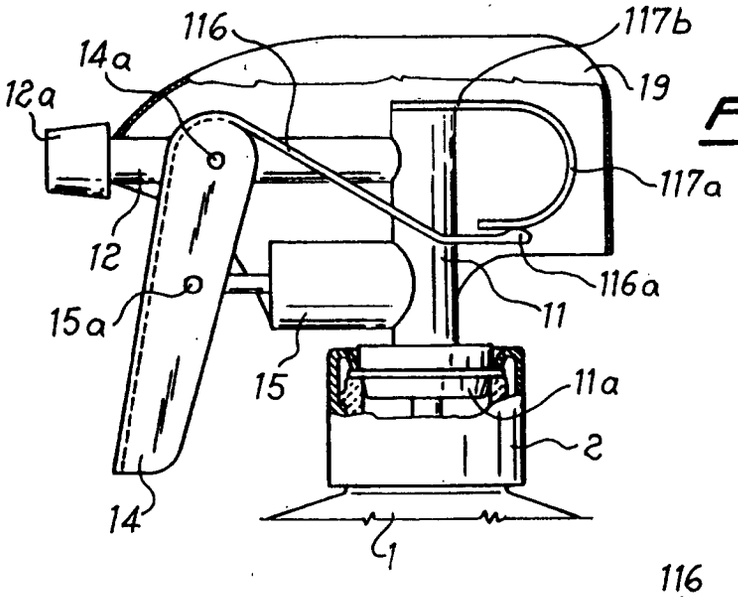


Fig.6a

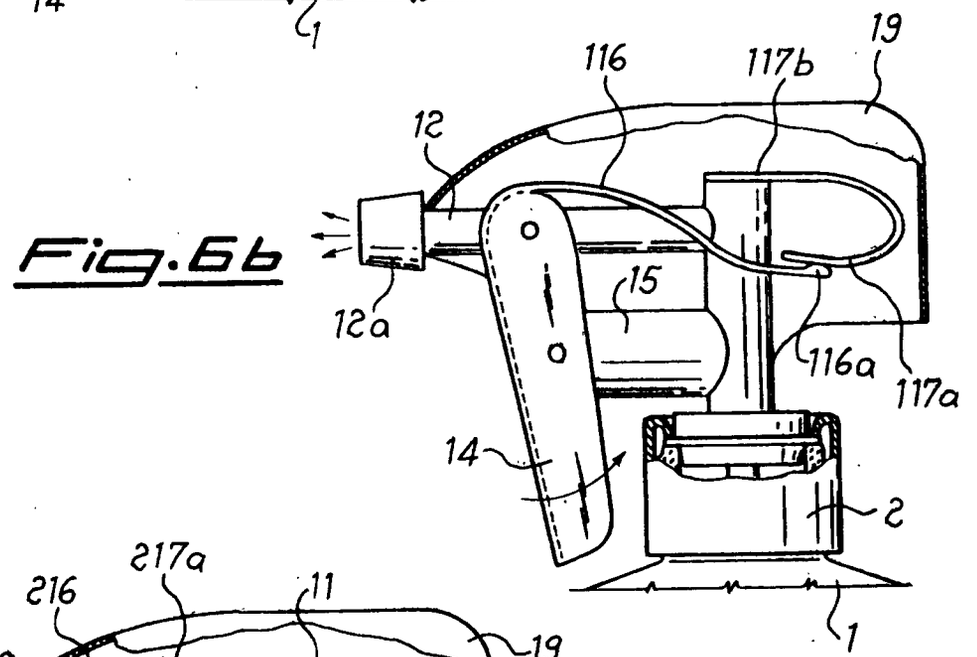


Fig.6b

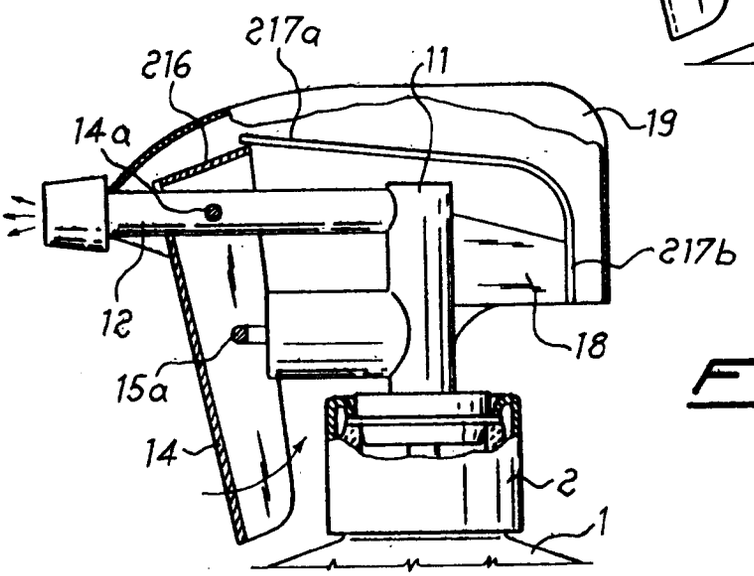


Fig.7