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(54) Dispenser head

(57) A dispenser head (1) is serving for opening a valve (3) in a container (2) and dispensing a fluid under pressure of a propellant in the container. The dispenser head comprises a socle (18) for mounting the dispenser head on the container and a plate-shaped cap (19), and a movable dispenser tube (21) with a seat (23) fitting the valve, and a first grip (24) supporting the dispenser tube. The cap has a first section (33) connected relatively inflexible to the socle (18), and a second section making up the second grip (25) and, at each side, connected to the first section (33) by means of a third flexible section (35) and a sheet hinge (36) placed above this. The first grip is made to swing around the hinge from a first position where the tube seat is at a distance from the valve, to a second position fixed by a lock making up the second hinge, and the tube seat is close to the valve. The second grip is, under the influence of an external pressure, made to bend the spring and swing the first grip around a second hinge to a third position where the tube seat engages with the now open valve. Thereby, the dispenser head with the discharge tube (22) can be irreversibly mounted on the container and is automatically returned with the empty container into the return network which thereby cannot refuse to receive it. The dispenser head is furthermore secured against being opened unintentionally, and it is easy to use.

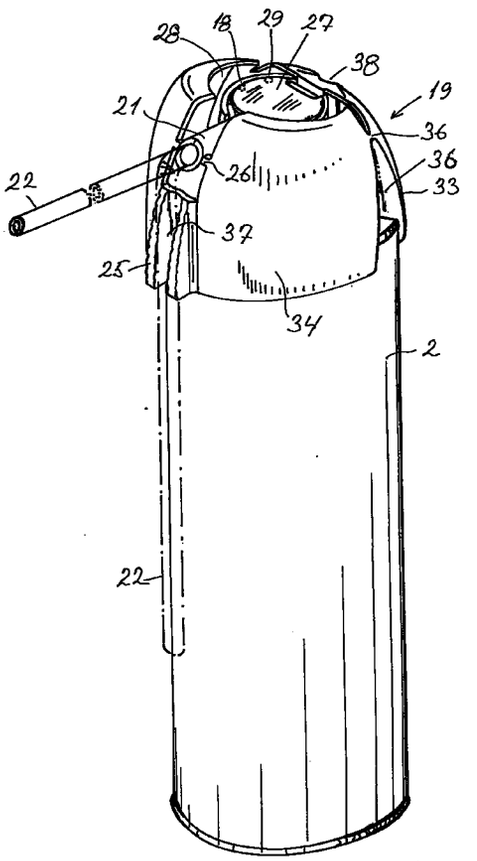

FIG.5

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Description

The invention concerns a dispenser head for opening a valve in a container and dispensing a fluid under pressure of a propellant, and comprising a base for mounting the dispenser head on the container and a movable dispenser tube with a seat fitting into the valve.

Containers of this kind are normally referred to as cans, and they are largely used in connection with for example insulating with PU-foam (polyurethane-foam). The known cans have a detachable actuator grip fitted with a dispenser tube. When the can is to be used, the grip is attached by means of for example a screw joint on the valve of the can, the valve can then be opened by manipulating the grip with your hands.

The PU-foam and the fluid in the can are among the chemicals which are forbidden to discard in nature, and empty cans must therefore be sent to destruction or deposition at special plants. For this purpose, a return network has been built, which however refuses to accept PU-cans missing the actuator grip which however is detachable and therefore often missing at that time. The users then have to dispose of the cans somewhere else and this will usually be with the household rubbish. This is forbidden, as it pollutes the environment unacceptably.

In the case of these traditional PU-cans, the valve is freely accessible and can therefore be opened even if the grip has not been attached which means that foam can suddenly flow out onto the surroundings. The foam is unhealthy and corrosive, and a person who unintentionally gets foam on him could therefore get hurt.

The detachable actuator grip is furthermore difficult to operate and does not always fit tightly when attached to the can which means that foam leakage may occur and the foam may come in contact with for example the hands of the user.

The object of the invention is to provide a dispenser head of the kind mentioned in the opening paragraph which, by the manufacturer, easily can be mounted as a practically inseparable part of the container, said dispenser head has an integrated actuator grip, it is easy and safe to handle, and it is arranged in such a way that the valve cannot unintentionally be opened.

The novel and unique features according to the invention, whereby this is achieved, is the fact that the dispenser head also comprises a spring fitted on the base, a first grip supporting the dispenser tube, and a second grip which, by means of a hinge, is connected to the first grip and is supported by the spring, whereby the first grip is made to swing around the hinge from a first position where the tube seat is at a distance from the valve, to a second position fixed by a lock forming a second hinge, and the tube seat is close to the valve, and the second grip is made to bend the spring by actuating an external pressure and swinging the first grip around the second hinge to a third position where the tube seat engages with the now open valve.

The dispenser head of this structure can be mounted in advance as a fixed component of the container, and since the actuator grip is an integrated part of the head, it will automatically be returned with the empty container to the return network which therefore cannot refuse to accept it. The dispenser head furthermore protects the valve in such a way that it cannot be opened by mistake, and it is easy to handle.

The second grip or the actuator grip cannot be made to open the valve as long as the first grip is at its first position, and the first grip thus makes up a safety against the valve being unintentionally opened and spilling out foam onto the surroundings. However, the precondition of this effect is that the first grip is exactly at its first position which therefore advantageously can be fixed by means of at least one breakable bridge placed between the grip and the base. The bridge must then be made in such a way that it can safely retain the first grip at its first position upon normal handling, but it must be relatively easy to break when the grip, by an external pressure, is swung to its second position in order to make the container ready for use. The breakable bridge can advantageously be visibly placed on the dispenser head so that it is possible to see if the bridge is intact whereby containers with broken bridges are easily identified and can be removed from the distributor network to eliminate the risk of future personal injuries.

The lock for fixing the first grip at its second position can advantageously consist of a ratchet pawl device which automatically and irreversibly is engaging and forming the second hinge when the grip is swung. By placing a stop on the base below the grip, the grip is furthermore secured against being swung so far that the valve is opened.

In an especially advantageous embodiment, the dispenser head can be made in one piece so that it does not comprise any loose parts. Such a structure can technically and economically best be made by plastic moulding, whereby the base can be shaped as an annular socle with a plate-shaped cap arching around the socle. In this structure, the valve is placed safely protected by the cap which at the same time is imparting the entire container a nice, pleasant exterior. However, the cap also forms an important part of the functioning of the dispenser head as several parts of the functional facilities of the head are hidden in different sections of the cap. One of these sections is connected relatively inflexible with the socle and serves as support for two other, flexible sections serving as springs for a section which makes up the actuator grip.

The cap can be made with an opening for putting in a finger and pressing the first grip to its second position when the container is to be used.

In an advantageous embodiment, the first grip has a circular push-button, and the annular socle is extending past this push-button whereby the socle gives protection against the grip being pressed down when the dispenser head, at the mounting, is pressed into place

upon the container. When the push-button is on a level below the cap opening, this protection is further secured.

The dispenser head can have a flexible discharge tube serving to direct the outflowing fluid to the place of use, and which is fixed to the dispenser head. A safe assembly is obtained when the discharge tube is fixed inside the dispenser tube, said assembly will not easily be made to leak under the influence of the pressure of the outflowing fluid.

For employment reasons, the discharge tube will often be rather long, and will therefore be in the way during transportation and storage. A groove can therefore be made in the second grip for conveniently fixing the bent discharge tube when the container is not in use.

A blind hole can furthermore be made in the dispenser head for fixing the free end of the discharge tube after use. This arrangement is especially advantageous in the case of PU-foam cans. For the foam will continue to expand in the discharge tube after use, but by putting the tube end into the blind hole, further outflow is stopped because the foam quickly congeals in the hole and closes the tube.

The invention will be explained in greater details below, where only exemplary embodiments are described with reference to the drawing, in which

fig. 1 is a top view of a first embodiment of a dispenser head according to the invention,

fig. 2 is a lateral view of the dispenser head shown in fig. 1 in secured state,

fig. 3 is the same in released state,

fig. 4 is the same in activated state,

fig. 5 is a perspective view of a second embodiment of a dispenser head according to the invention mounted on a container,

fig. 6 is a lateral view, partly in section, of the dispenser head shown in fig. 5 in secured state,

fig. 7 is the same in released state, and

fig. 8 is the same in activated state.

In fig. 1 - 4 is seen a first embodiment of a dispenser head 1 mounted on a container 2 with a valve 3. In the following, it is assumed that the container is a PU-can filled with a PU-fluid which, under pressure of a gas, flows out through the valve and forms foam for e.g. insulation purposes.

The dispenser head has an annular base 4 with a round extending groove 5 fitting tightly onto a bulb 6 on the can 2. The dispenser head is mounted by pressing down the base and making the groove engage with the bulb.

The dispenser head furthermore has a dispenser tube 7 for leading the fluid out through the dispenser head and further through a discharge tube 8 to the place of use which is to be filled with PU-foam. The dispenser tube has a seat 9 fitting the valve 3.

The dispenser tube is placed upon or is part of a first grip 10 which is connected to a second grip 11 by means of a first hinge 12, in this case, shaped as a sheet hinge. The second grip 11 is furthermore unreleasably connected to the base 4 by means of a spring 13.

The first grip 10 can swing around the hinge 12 from the first position, shown in fig. 2, to the second position, shown in fig. 3, whereby the seat 9 of the dispenser tube is swung to a position close to the valve 3. At the second position, the first grip is fixed by means of a pawl 14 engaging with a corresponding pawl 15 on the base 4. At the same time, the grip is close to or in contact with the top side of the base which thereby is acting as a stop for the swinging movement.

An upright tab 16 is placed on the base on both sides of the first grip, the tab is connected to the first grip at its first position by means of some bridges 17. The bridges are strong enough to fix the first position during normal handling, but when the grip, by a pressure of e. g. a finger, is to be swung to its second position, the bridges must be able to be broken.

If the second grip 11, as shown in fig. 4, is pressed in the direction indicated by the arrow by e.g. a finger when the first grip 10 is at its first position, the spring 13 is bent and the first grip is made to swing around an area at the bridges 17 of the upright tabs 16. In this case, the initial distance is, however, too great for the seat being able to reach and open the valve, and the PU-can is therefore secured against being opened by mistake.

The safety of the PU-can is released by, as shown in fig. 2, pressing down the first grip 10 and breaking the bridges 17. Then the first grip can be swung to its second position where it is retained by the engagement with the pawls 14, 15 forming together the second hinge. The seat 9 is now close to the valve.

If the second grip 11, as shown in fig. 4, now is swung in the direction of the arrow under the influence of the pressure of a finger and thereby bends the spring 13, the first grip 10 is swung downwards. In this case, the initial distance however is so short that the dispenser tube during the swinging movement opens the valve. The PU-can is now open and the frothing fluid is flowing, as shown, out of the can via the open valve 3, the dispenser tube 7 and the discharge tube 8.

Fig. 5 shows, in perspective, a second embodiment of the dispenser head according to the invention. This structure is shown partly in section from the side in fig. 6, 7, and 8. In the following, it is assumed that the dispenser head is plastic moulded in one piece.

In this case, the base consists of an annular socle

18 and a plate-shaped cap 19 arching around the socle. On the socle is formed a round extending groove 20 fitting tightly onto the bulb 6 on the can 2. The dispenser head is mounted by, with a downwards pressure upon the cap 19, pressing down the socle and making the groove engage with the bulb 6 on the can 2. The cap is of double curvature and can therefore withstand being pressed with a strong pressure when the dispenser head is to be mounted upon the can. The dispenser head can thereby be fixed on the can so firmly that it cannot or only with difficulty can be torn off by hand. The dispenser head can be mounted manually, but the structure is well suited for mechanical mounting.

In the dispenser head is a dispenser tube 21 for, when being used, leading the fluid out through the dispenser head and further through a discharge tube 22 to a place of use which is to be filled with PU-foam. The dispenser tube has a seat 23 fitting the valve 3.

The dispenser tube 21 is placed upon or is part of a first grip 24 which is connected to a second grip 25 by means of a first hinge 26 (fig. 5).

Like the first grip 10 of the first embodiment shown in fig. 2 - 4, the first grip 24 can be swung from a first position in fig. 6 to a second position in fig. 7 and a third position in fig. 8. At the first position, the seat 23 is at a distance from the valve 3, and at the second position, it is close to the valve.

As it is best seen in fig. 5, the first grip 24 has a circular push-button 27, and the cap 19 has an opening 28 which allows a finger getting in and pushing the button. The socle 18 is extending up around the button 27 at the first position of the first grip and is, at this position, connected to the button 27 by some relatively thin bridges 29 which are strong enough to fix the first position during normal handling. When the first grip is to be swung to its second position, the bridges must however be able to be broken by a pressure of a finger upon the button 27. At the first position, the push-button 27 is at a distance from the opening 28 to secure against the push-button 27 being activated and the bridges broken in connection with for example the mounting of the dispenser head.

At the second position, the first grip is fixed by means of a pawl 30 engaging with a corresponding pawl 31 on the socle 18. The first grip can therefore not return to its first position. At the same time, a stop 32 on the socle ensures that the size of the intended swing angle is not exceeded. The pawl 30, 31 together form a second hinge.

The cap has a first section 33 connected relatively inflexible with the socle 18 and a second section 34 which, on each side, is connected to the first section 33 by means of a third flexible section 35 and a sheet hinge 36 placed above this section. The first section fits the can 2 rather tightly, while the second section 34 has an area opposite the first section 33, which is at a distance from the can.

The safety of the dispenser head is released by, with a pressure of for example a finger upon the push-button 27, breaking the bridges 29 and swinging the first grip 24 from the secured position shown in fig. 6 to the released position shown in fig. 7. At this position, the seat 23 of the dispenser tube is close above the valve 3. As shown in fig. 8, the pressure of for example a finger acting upon the second section 34 in the direction of the arrow will make this section swing around the sheet hinge 36 compacting the flexible section 35, whereby the first grip is swung downwards around the pawl connection 30, 31, and the dispenser tube seat 23 is made to open the valve 3. The frothing fluid is now flowing out of the PU-can via the open valve 3, the dispenser tube 21 and the discharge tube 22.

As can be seen, the flexible third section 35 corresponds to the spring 13 of the first embodiment shown in fig. 1 - 4 and the second section 34 corresponds to the second grip 11. The section 34 thus makes up the second grip 25 of the second embodiment.

Compared with the first embodiment, the second one has the advantage that it affords the valve better protection and has a more attractive design, and it is optimally operatably seen from an ergonomic point of view.

The discharge tube 22 is, as shown, fixed inside the dispenser tube 21, whereby a safe and tight assembly is obtained. The discharge tube will normally be made of a relatively soft material, and will therefore be inclined to get stuck inside the stronger dispenser tube by the pressure of the outflowing fluid.

A groove 37 is made in the second grip 25, as shown in fig. 5, for easily fixing of the bent discharge tube 22 when the container is not in use. Thereby, the tube is not in the way during tranportation and storage.

A blind hole can furthermore be made in the dispenser head for fixing the free end of the discharge tube after use, whereby the foam quickly congeals in the hole and cuts off further foam-outflow.

The invention is described above on the assumption that the container is a PU-can. Naturally, this is only to be seen as an example, and the dispenser head can, within the scope of the invention, be used for any container with any kind of fluid under pressure of a propellant.

Claims

1. A dispenser head for opening a valve in a container and dispensing a fluid under pressure of a propellant, and comprising a base for mounting the dispenser head on the container and a movable dispenser tube with a seat fitting into the valve, **characterized** in that the dispenser head also comprises a spring fitted on the base, a first grip supporting the dispenser tube, and a second grip which, by means of a hinge, is connected to the first grip and is supported by the spring, whereby the first grip is made to swing around the hinge from a

first position where the tube seat is at a distance from the valve, to a second position fixed by a lock forming a second hinge, and where the tube seat is close to the valve, and the second grip is made to bend the spring by actuating an external pressure and swinging the first grip around the second hinge to a third position where the tube seat engages with the now open valve.

2. A dispenser head according to claim 1, **characterized** in that the first grip is fixed at its first position by at least one breakable bridge extending from the grip to the base, and which is made to be broken when the grip, by an external pressure, is swung to its second position.

3. A dispenser head according to claim 1 or 2, **characterized** in that the lock for fixing the first grip at its second position consists of a ratchet pawl on the grip and a corresponding ratchet pawl on the base, and that the base has a stop restricting the swinging of the first grip from the first to the second position.

4. A dispenser head according to claim 1, 2 or 3, **characterized** in that the base consists of an annular socle for mounting the dispenser head on a collar or bulb on the container, and a plate-shaped cap arching around the socle and connected to this.

5. A dispenser head according to claim 4, **characterized** in that the cap has a first section connected relatively inflexible with the socle, and a second section connected, on each side, to the first section by means of a third flexible section, whereby the second section makes up the second grip and the third section the spring.

6. A dispenser head according to each of the claims 4 or 5, **characterized** in that the cap has a hinge which pivotally connects the second and the third section.

7. A dispenser head according to each of the claims 4, 5 or 6, **characterized** in that the cap has an opening allowing the first grip being influenced by an external pressure of for example a finger.

8. A dispenser head according to each of the claims 1 - 7, **characterized** in that the dispenser head is made in one piece of for example plastic.

9. A dispenser head according to each of the claims 4 - 8, **characterized** in that the first grip has a circular push-button of a slightly smaller diameter than the inside diameter of the socle, that the socle is extending to this push-button at the first position of the first grip, and that at least one of the breakable bridges connects the push-button to the socle at this position.

10. A dispenser head according to each of the claims 1 - 9, **characterized** in that the dispenser tube has a flexible discharge tube fixed inside the dispenser tube, that a groove is made in the second grip for fixing the discharge tube, and that a blind hole is made in the dispenser head for fixing the free end of the discharge tube after use.

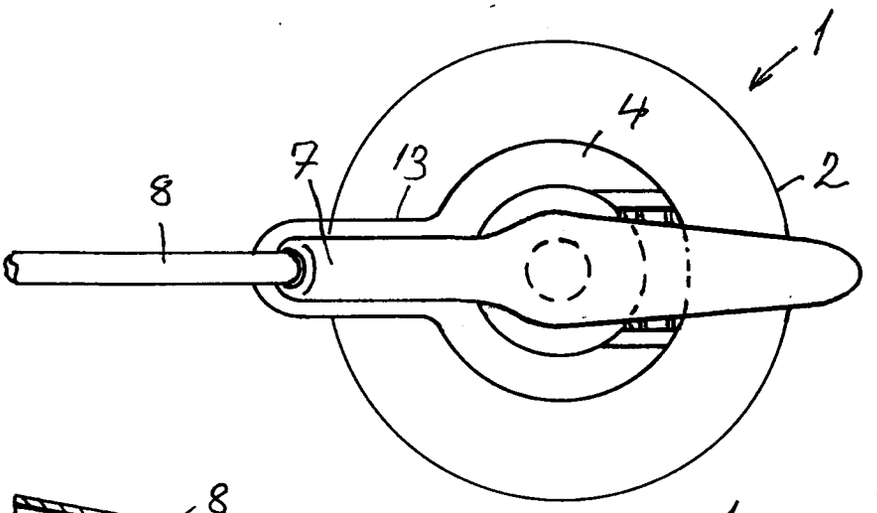

FIG.1

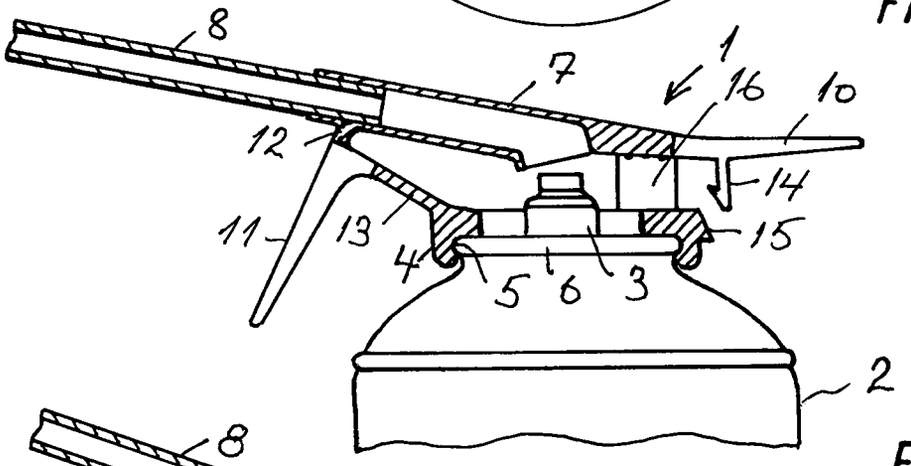

FIG.2

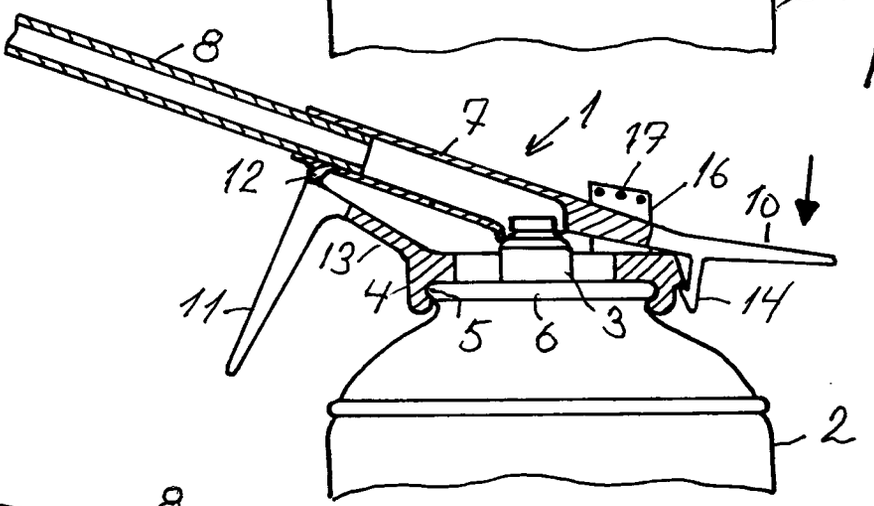

FIG.3

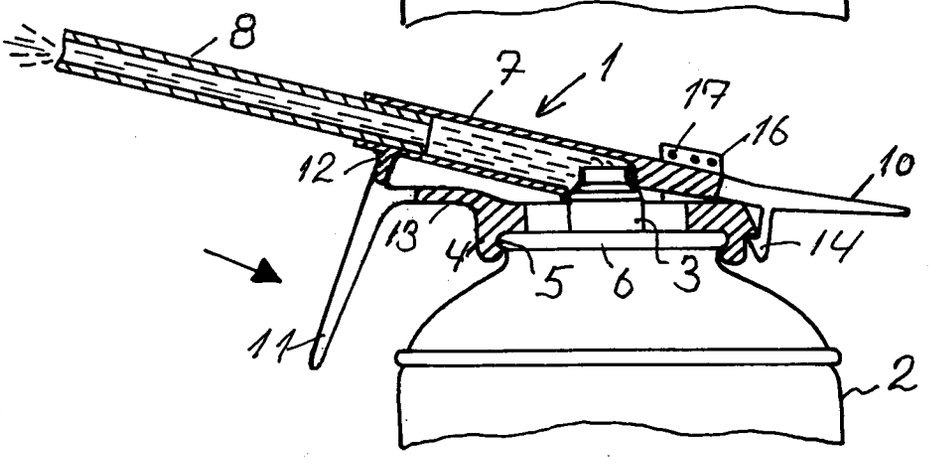

FIG.4

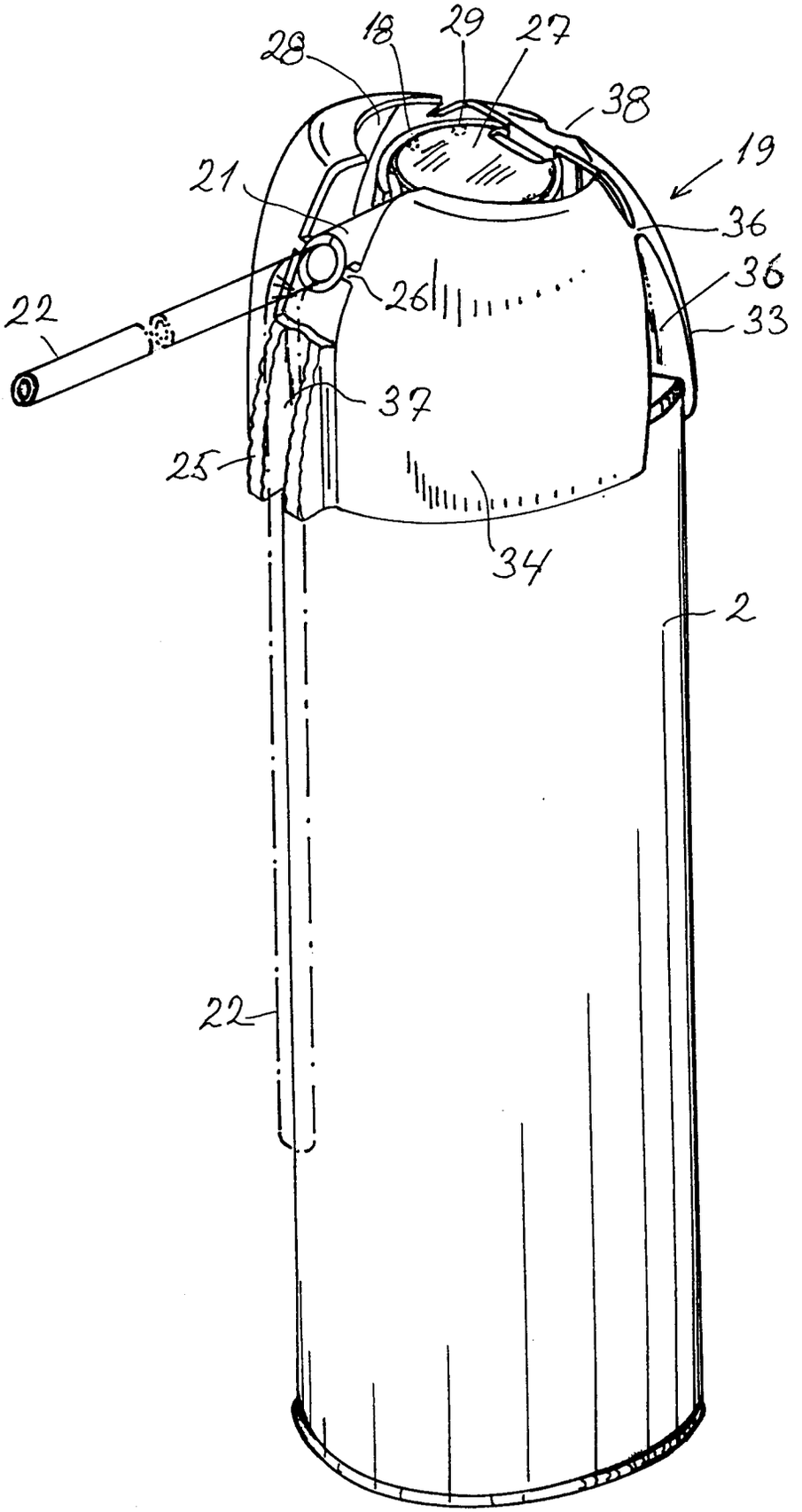

FIG.5

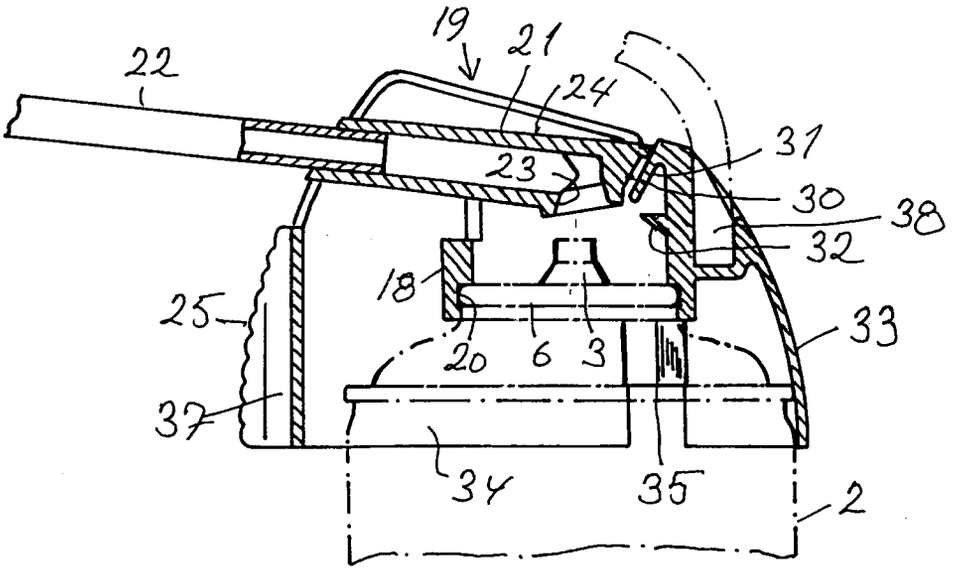

FIG.6

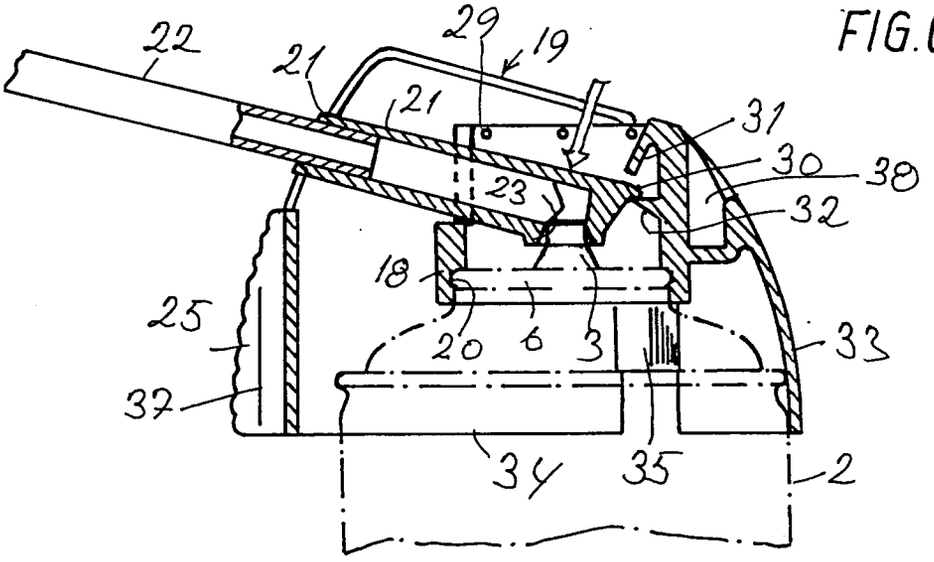

FIG.7

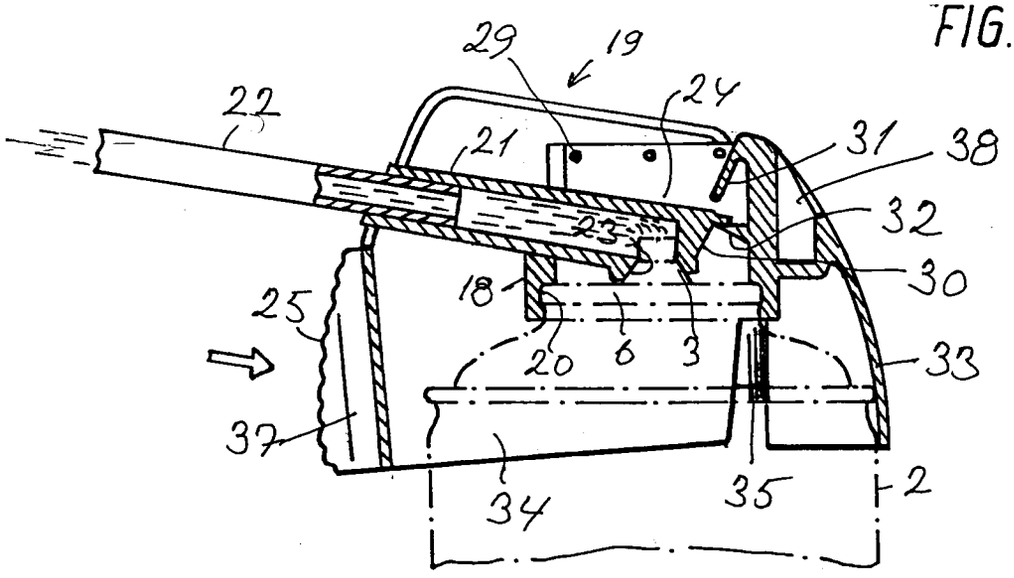

FIG.8

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 97 20 4049

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.6)
X	US 4 690 312 A (CRASPER) * column 4, line 54 - column 5, line 54; figures 5A,5B *	1,3,4,7, 8	B65D83/16 B65D83/14 B65D83/20
X	EP 0 097 094 A (VALVE PRECISIONS S.A.R.L.) * page 6, line 7 - line 19 * * page 9, line 2 - page 10, line 24; figures 1-4,6,7,10-12 *	1	
A	DE 43 13 319 A (C. EHRENSPERGER AG) * figures 1,2 *	1	
A	US 5 154 323 A (QUERY) * column 4, line 4 - line 11; figures 1-4 *	1	
A	FR 2 222 859 A (REBOUL-SOFRA) * page 5, line 9 - page 7, line 26; figures 1-5 *	1	
A	GB 2 079 183 A (FUMAKILLA LTD) * figures 1-5 *	10	TECHNICAL FIELDS SEARCHED (Int.Cl.6) B65D B05B
A	US 3 531 026 A (VENUS JR.) * column 4, line 61 - column 5, line 56; figures 1-7 *	1,2,8	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	4 March 1998	Berrington, N

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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