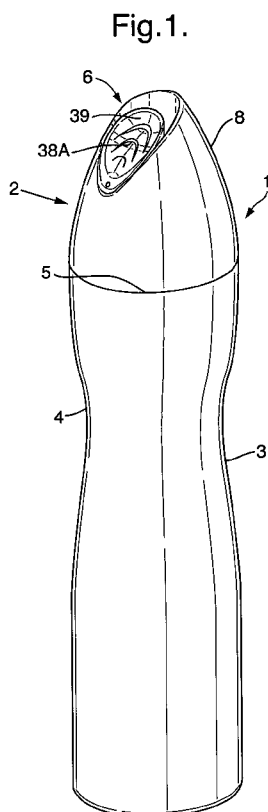




- (51) **International Patent Classification:**  
*B65D 83/16* (2006.01)      *B65D 83/14* (2006.01)
- (21) **International Application Number:**  
PCT/EP2009/064314
- (22) **International Filing Date:**  
29 October 2009 (29.10.2009)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**  
08168360.9    5 November 2008 (05.11.2008)    EP  
0911507.2    3 July 2009 (03.07.2009)            GB
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- (81) **Designated States** (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ,

[Continued on next page]

(54) **Title:** HAND HELD AEROSOL DISPENSER



(57) **Abstract:** An ergonomically excellent hand-held aerosol dispenser (1) comprising an aerosol container (3) and an attached spray through cap (2), the container (3) having a valve (15) at its top and a waisted section (4) towards its upper end, the upper expansion of the waisted section (4) smoothly continuing into the attached cap (2), the attached cap (2) reaching a maximum cross-sectional dimension which decreases further up and having: (i) an actuator button (6) located on its surface (8) above its maximum cross-sectional dimension, said button (6) being angled upwards at from 15° to 50°; (ii) a spray aperture (7) on the opposite side of the cap (2) from the actuator button (6); and (iii) an associated spray channel (15) providing a fluid connection between the valve (15) on the container (3) and the spray aperture (7); the dimensions of the dispenser (1) allowing the consumer to grip the dispenser (1) around the waisted section (4) of the container and, with the same hand, press upon the actuator button (6) with an index finger to operate the dispenser (1).

CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

**(84) Designated States** (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ,

TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Published:**

- with international search report (Art. 21(3))
- with information concerning incorporation by reference of missing parts and/or elements (Rule 20.6)

## Hand Held Aerosol Dispenser

### Field of Invention

5 The present invention concerns a hand held aerosol dispenser, in particular a hand held aerosol dispenser for dispensing a cosmetic composition onto the surface of the human body.

### Background

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US 6,398,082 discloses an actuating mechanism for a hand held canister in which a slider is moveable by finger pressure from a valve-disengaged position into a valve-engageable position and a concealed spring returns the slider to a valve-disengaged position when finger pressure is removed.

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### Summary of Invention

An object of the present invention is to provide an ergonomically excellent aerosol dispenser with a slideable actuator button.

20

In a first aspect of the present invention there is provided a hand-held cylindrical aerosol dispenser comprising an aerosol container and an attached spray through cap, the container having a valve at its top and a waisted section towards its upper end, the upper expansion of the waisted section smoothly continuing into the attached cap, the attached cap reaching a maximum cross-sectional

25 dimension which decreases further up and having:

- (i) an actuator button located on its surface above its maximum cross-sectional dimension, said button being angled upwards at from 15° to 50°;
- 30 (ii) a spray aperture on the opposite side of the cap from the actuator button; and

- 2 -

- (iii) an associated spray channel providing a fluid connection between the valve on the container and the spray aperture;

the dimensions of the dispenser allowing the consumer to grip the dispenser  
5 around the waisted section of the container and, with the same hand, press upon  
the actuator button with an index finger to operate the dispenser.

In a second aspect of the present invention, there is provided a method of  
applying a cosmetic aerosol composition to the human body comprising the use of  
10 an actuator according to the first aspect of the invention.

#### Detailed Description

Throughout this description, orientation terms such as “top”, “upper”, “vertical”,  
15 “horizontal”, and “downward” should be understood to be referring to the  
dispenser in its “upright” position with the base of the container sat on a horizontal  
surface. Such orientation for the dispenser is illustrated in Figures 1 and 2.

The term “depend” should be understood to refer to features that project  
20 downwards from others.

The term “lateral” should be understood to refer to the plane approximately  
orthogonal to the vertical axis of the dispenser when oriented as described in the  
paragraph before last.

25

The dispenser’s vertical axis may be thought of as its principle axis and the term  
“horizontal” refers to the plane orthogonal to this axis.

The dispenser of the present invention is easy to operate using a single hand.  
30 The angled actuator button and waisted design of the container enable the  
dispenser to be convenient held in the hand with the index finger able to operate

- 3 -

the actuator *via* a simple extension action. Desirably, the dispenser is dimensioned such that the consumer may grip the waist of the container between the ball of her thumb and her third and fourth fingers and have her index finger in slightly bent position when her finger pad is placed on the centre of a finger pad at the top of the actuator button prior to actuation.

The top surface of the actuator button should be considered to be the finger pad thereof.

10 The waisted section of the container should be understood to be a narrowed section of smooth contour. That is to say, a section of gradually decreasing diameter towards the "waist", followed by a section of gradually increasing diameter. The "waist" should be understood to be the narrowest part of the waisted section.

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The "upper" part of the dispenser should be understood to be the part of the dispenser above its waist and the "lower" part of the dispenser should be understood to be the part of the dispenser below its waist.

20 The waisted section of the container is typically present as part of the top half of the container and preferably as part of its top third.

The upper expansion of the waisted section continues smoothly into the attached spray through cap. That is to say, the upward expansion of the diameter of the dispenser continues to approximately the same degree on moving from the container to the cap. This does not preclude the possibility that there is a clear join between the container and the spray through cap; indeed, this is normal (*vide infra*). Preferably, the maximum diameter of the upper part of the dispenser is at the point where the spray through cap fits onto the container.

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- 4 -

For reasons of stability, the maximum diameter of the upper part of the dispenser is preferably no greater than the maximum diameter of the lower part of the dispenser. More preferably, the diameter of the upper part of the dispenser is the same or approximately the same as the diameter of the lower part of dispenser.

5

In preferred embodiments, the spray through cap is lockable into place on top of the aerosol container. This may be achieved by means of beading around the bottom inside edge of the spray through cap and an associated groove towards the top of the aerosol container. By having the spray through cap "locked" into place on top of the aerosol container, operational robustness is improved.

10

The spray through cap is a cap through which the product in the aerosol container may be dispensed (sprayed) without being removed. This is achieved by having an associated spray channel that gives fluid communication between the valve on the container and the spray aperture in the spray cap.

15

The spray aperture is a gap defined by an outer wall of the spray through cap. Through this gap, the spray channel allows the contents of the container to be dispensed when the valve on the container is opened. The spray aperture is to be considered to be at the front of the dispenser.

20

The valve on the container may be opened by downward pressure upon it, typically generated by downward pressure upon the associated spray channel.

In preferred embodiments, the waist of the container has an outer diameter of from 30 mm to 40 mm, more preferably from 33 mm to 39 mm, and most preferably from 35 mm to 37 mm.

25

In preferred embodiments, the waist of the container is located at from 70 mm to 90 mm, more preferably at from 75 mm to 81 mm, and most preferably at from 77.5 mm to 79.5 mm from the centre of the finger pad of the actuator button, measured as the minimum distance along the curved outer surface of the

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- 5 -

dispenser. These dimensions are particularly suitable when the dispenser is to be used by women, the resulting dispenser fitting well in the typical female hand and being particularly easy to use.

- 5 In preferred embodiments, the ratio of the outer diameter of the waist of the container to the distance between the outer diameter of the waist and the centre of the finger pad of the actuator button, measured as the minimum distance along the curved outer surface of the dispenser, is at least 0.42 to 1 and no greater than 0.50 to 1, more preferably being at least 0.44 to 1 and no greater than 0.48 to 1, and most preferably being at least 0.45 to 1 and no greater than 0.47 to 1. These dimensions are particularly suitable when the dispenser is to be used by women, the resulting dispenser fitting well in the typical female hand and being particularly easy to use.
- 10
- 15 In preferred embodiments, the ratio of the outer diameter of the waist of the container to the diameter of the container at the point where the spray through cap fits onto the container, is at least 1 to 1.15 and no greater than 1 to 1.35, more preferably being at least 1 to 1.2 and no greater than 1 to 1.3, and most preferably being 1 to 1.25. These relative dimensions, particularly in combination with one of the preferred ratios detailed in the above paragraph, lead to enhanced ergonomic benefits.
- 20

The actuator button is preferably operated by sliding it; sliding the actuator button forward causing release of the contents of the aerosol container *via* the spray aperture. The sliding of the button can be conveniently done by extending one's index finger when said finger is in a slightly bent position with one's finger pad sitting on the centre of the actuator button.

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For repeated use, it is highly preferred that the actuator button has a return mechanism. Typically the actuator button is fitted with a return spring that is

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- 6 -

energised when the button is pushed forwards and serves to return the button to its original position when pressure on the button is removed.

5 The actuator button is at an angle of from 15° to 50°, preferably 20° to 45°, and more preferably 25° to 40°, to the horizontal. These angles should be considered the angle between the actuator button along its front-back axis and the horizontal line in the same vertical plane. When the actuator is curved, it is required that there is a tangent to the curve at the angle indicated.

10 The actuator button may have ribs running across its top surface in order to increase grip. Preferably, the top surface of the button is made of a thermoplastic elastomer for the same reason. The main body of the actuator button may be made of an alternative plastic material, for example an acetal co-polymer.

15 The actuator button, in particular the finger pad thereof, is preferably curved upwards at its front end. This serves to aid the sliding forward of the button and may thus contribute to the ergonomic advantages of the invention.

20 The release of the contents of the container is typically *via* a spray channel leading from a valve at the top of the container to the spray aperture. In preferred embodiments, when the actuator button is slid forwards, it is possible for downward pressure to be exerted on the valve, thereby opening said valve and allowing the pressurised aerosol composition within the container to be dispensed.

25 In preferred embodiments according to the preceding paragraph, the actuator button is slid forwards and then downwards in order to exert downward pressure on the valve at the top of the aerosol container. Preferably, this is achieved *via* a projection depending from the actuator button exerting downward pressure on the spray channel, which in turn exerts downward pressure of the valve.

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- 7 -

The spray through cap, including the associated spray channel are typically made of plastic, such as polypropylene. A typical method of manufacture is injection moulding.

5 The aerosol container used in accordance with the present invention is typically made of tin-plate or aluminium. The valve is located at the top of the container, typically in a central position. The container is able to withstand the pressure of the aerosol composition stored within. This pressure may be up to 2 or 3 bar, up to 10 bar, or even up to 14 bar.

10

The aerosol container preferably contains a cosmetic composition for application to the surface of the human body. With such use and such compositions the ergonomic benefits of the present invention are particularly advantageous, the dispenser being particularly suitable for spraying products towards the user's own  
15 body. This is especially true for spray products typically targeted towards the underarm areas, that is to say deodorant and antiperspirant compositions.

The features described with reference to the following specific embodiment may be incorporated independently into the generic description given above and/or as  
20 given in the claims.

Figure 1 is a rear/side view of a dispenser (1) according to the present invention comprising a spray through cap (2) in place on top of a waisted aerosol container  
25 (3).

25

Figure 2 is a front/side view of the dispenser (1) illustrated in Figure 1.

Figure 3 is an exploded rear/side view of the dispenser (1) illustrated in Figure 1, minus the valve cup and associated valve that would normally be present on top  
30 of the aerosol container (3).

- 8 -

Figure 4 is a rear/side/top view of the spray through cap (2).

Figure 5 is a front view of the spray through cap (2).

- 5 Figure 6 is a top view of the spray through cap (2) with section lines A-A, B-B, and C-C indicated.

Figure 7 is a bottom view of the spray through cap (2).

- 10 Figures 8 and 9 are sections across the beading (10 and 11, respectively) at the bottom of the spray through cap (2).

Figure 10 is a section through the spray through cap (2) along A-A.

- 15 Figure 11 is a section through the spray through cap (2) along B-B.

Figure 12 is a section through the spray through cap (2) along C-C.

Figure 13 is a front/side view of the spray channel (15).

20

Figure 14 is a front/side view of the actuator button (6) from slightly underneath.

- 25 With reference to Figures 1 to 3, the aerosol container (3) has a waisted section (4) towards its upper end. The upper expansion of the waisted section (4) of the aerosol container (3) continues smoothly into the attached spray through cap (2), although there is a clear join (5) between the two.

- 30 The spray through cap (2) has a slideable actuator button (6) present on its surface above its maximum cross-sectional dimension and on the opposite side therefrom there is a spray aperture (7) defined by a side-wall (8) of the spray through cap (2).

- 9 -

The dispenser (1) is designed for maximum ease of handling, especially by the female hand. The waisted section (4) may be easily gripped between the ball of the user's thumb and third and fourth fingers and when gripped in such a manner, the pad of the index finger of the user's same hand may rest upon the actuator button (6) with the index finger in a slightly bent position, ready for forward and upward extension.

In this specific embodiment, the ratio of the outer diameter of the waist of the container (3) to the distance between the outer diameter of the waist and the centre of the actuator button (6), measured as the minimum distance along the curved outer surface of the dispenser, is 0.46 to 1.

The spray through cap (2) and features thereof are further illustrated in Figures 4 to 12. The spray through cap (2) has a circular cross-section, defined by the side-wall (8), the diameter of the spray through cap (2) decreasing towards its upper end. The side-wall (8) defines an oval spray aperture (7) which is to be considered to be at the front of the dispenser (1). The oval spray aperture (7) has its short axis in the horizontal direction and is located towards the upper end of the side-wall (8).

Projecting inwardly from the side-wall (8) on either side of the spray aperture (7) are two support wings (9). These support wings (9) are thin walls extending from the top of the side-wall (8) to a point approximately half way down its length. From the side of each of the support wings (9) facing the spray aperture (7) there projects a spray channel guide wall (10). These spray channel guide walls (10) are in a vertical plane orthogonal to the front-back axis (A-A) of the dispenser (1). They extend from the support wing (9) towards one another in the vicinity of the spray aperture (7). The spray channel guide walls (10) terminate leaving a gap between them that is always slightly greater than the short axis of the oval spray

aperture (7).

At the bottom of the side-wall (8) there is beading (11A and 11B) intended to enable the spray through cap (2) to snap lock onto the top of an aerosol container  
5 (1). The beading consists of six smooth beads (11A) equally distributed around the bottom inner surface of the side-wall (8) and interspersed by corrugated beading (11B). Detailed cross-sections of the beading (11A and 11B) is illustrated in Figures 8 and 9 respectively. The beading snap-fits into an indentation (12) around the top of the aerosol container 1 (see Figure 3).

10

The spray through cap (2) also has a top wall (13) defining an aperture (14); the aperture being intended to accommodate a segment of an associated spray channel (15) (*vide infra*). The top wall (13) is linked to the side-wall (8) by an inner wall (16) that varies in height from front to back, being relatively high at the front  
15 and decreasing towards the back.

The top wall (13) has a major segment (13A) that is angled upwards towards the front of the actuator at an angle of approximately 32° from the horizontal and a minor segment (13B) that is approximately horizontal. (See Figure 11). The  
20 minor segment (13B) is present at the front end of the top wall (13). The aperture

(14) in the top-wall (13) is located centrally where the major (13A) and minor (13B) segments join, but is largely defined by the latter.

25

On either side of the aperture (14), i.e., in a directional orthogonal to the direction of movement of the actuator button (6), two projections (17) rise from the minor segment (13B) of the top wall (13). The projections (17) each have raised ridge (18) on their side adjacent to the aperture (14).

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A largely circular aperture wall (19 and 20) lines the aperture (14) and both

- 11 -

depends from and rises from the top wall (13) in a vertical direction. (See Figure 12). The lower segment (19) depending from the top wall (13) is longer than the upper segment (20) rising from the top wall (13). The lower segment (19) depending from the top wall (13) has a gap (21) at its front, parallel further walls (22) extending from the edges of the gap (21) towards the spray aperture (7).  
5 These parallel further walls (22) have lower edges (23) that slope upwards in the direction of the spray aperture (7). The parallel further walls (22) terminate level with the outer edge (24) of the inner wall (16).

10 The upper segment (20) of the aperture wall that rises from the top wall (13) is abutted by the aforementioned projections (17) that also rise from the top wall (13). From the front of upper segment (20), there extends a raised vault (25), linking upper segment (20) to the inner wall (16) and bridging a "gap" in the minor segment (13B) of the top-wall (13) and the upper segment (20) of the aperture  
15 wall. The raised vault (25) is domed at its top and its inner faces (26) are contiguous with the inner faces of the parallel further walls (22) extending from the edges of the gap (21) in the lower segment (19) of the aperture wall depending from the top wall (13). The raised vault (25) is designed to accommodate a segment of the spray channel (15) (*vide infra*).

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The inner face (20C) of the largely circular aperture wall (19 and 20) is contiguous and has vertical recessions (20D) on either side aligned with the two projections (17) that rise from the top wall (13) on either side of the aperture (14).

25 From the major segment (13A) of the top wall (13), a central projection (27) rises and has a rear face (28) that extends through a gap (29) in the top wall (13). This extensive rear face (28) forms a substantial bearing wall and will be referred to as such subsequently.

30 Towards the back of the major segment (13A) of the top wall (13), restraining clips (30) project. These are intended for restraining a segment of the actuator button

- 12 -

(6) (*vide infra*). The clips (30) sit over parallel slits (31) in the top wall (13) that extend backwards from the restraining clips (30) – i.e. in the direction away from that in which the actuator button (6) is pushed.

5 Two further parallel slits (32) are present in the major segment (13A) of the top wall (13). These further parallel slits (32) also run from front to back and are located on either side of the central projection (27), extending from immediately behind the projections (17) that rise from the top wall (13) to a point level with the rear face (28) of central projection (27).

10

The aforementioned spray channel (15) is illustrated in Figure 13. It is comprised of a vertical segment (33) and a segment (34) at an angle of approximately 114° to the vertical segment (33), i.e., 24° from the horizontal. The vertical segment (33) and the angled segment (34) are in fluid connection.

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The vertical segment (33) of the spray channel (15) is designed to fit onto a valve stem (not illustrated) of the aerosol container (3) and is flared at its base (36V) to aid said fitting. The vertical segment (33) of the spray channel (15) is also designed to fit snugly within the aperture (14) in the top wall (13) of the spray  
20 through cap (2) (*vide supra*). In this manner, lateral movement of the spray channel (15) is restricted. The vertical segment (33) of the spray channel (15) has a resilient area (35) at its top upon which a segment of the actuator button (6) presses when the dispenser (1) is operated.

25 The vertical segment (33) of the spray channel (15) has a vertically orientated oblong block (33A) projecting from either of its sides, i.e., in a directional orthogonal to the direction of movement of the actuator button (6). These oblong blocks (33A) are designed to be able to slide within the vertical recessions (20D) in the inner face (20C) of the largely circular aperture wall (19 and 20). By such  
30 means, rotational movement of the spray channel (15) is restricted.

The vertical segment (33) of the spray channel (15) has two small retaining clips (33B), each present a little way above the oblong blocks (33A) on either of its side. These clips (33B) serve to hold the spray channel (15) in place during manufacture and snap out of the way on first use of the dispenser (1).

5

The angled segment (34) of the spray channel (15) is narrower than the vertical segment (33), both internally and externally. The angled segment (34) leads from the top of the vertical segment (33) towards to the spray aperture (7). At the spray aperture end of the angled segment (34), there is an oval disc (36D), designed to fit immediately behind the oval spray aperture (7) and leave no gap visible from the outside at any time. There is also a conventional swirl chamber (37) at the end of the angled segment (34), designed to improve spray quality.

The actuator button (6) is illustrated in Figure 14. It is comprised of a finger pad (38) and various features dependent therefrom. The finger pad (38) is longer in the front-back direction, i.e. the direction in which it is designed to slide. The finger pad is designed to sit on the top wall (13) of the spray through cap (2). The finger pad (38) curves upwards at its front end (39) in order to increase ergonomics of use. There are also curved projections (38A) on its top surface for this same purpose. (See Figures 1 and 3 for these features).

Vertically dependent from the finger pad (38) are two orientation clips (40) that are designed to pass through the two parallel slits (32) that are present in the major segment (13A) of the top wall (13) located on either side of the central projection (27). The clips (40) have outwardly facing wedges (41) that aid their insertion into the slits (32), the clips (40) being temporarily bent inwards when this is done. When the actuator button (6) is pressed, the retaining clips (40) slide forwards within their respective slits (32).

Depending from the finger pad (38) along its central front-back axis is a keel-shaped structure (43). Said structure slopes outwards from the lower side of the

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- 14 -

finger pad (38) near its front end and terminates approximately half way along the length of the finger pad (38). The lowest part (44) of the keel-shaped structure (43) is designed to press down upon the resilient area (35) at the top of the vertical segment (33) of the actuator button (6) when the dispenser (1) is  
5 operated.

A resilient leaf spring (45) depends from the finger pad (38) at a point towards the rear of its front-back axis. The leaf spring (45) is positioned to pass through the gap (29) in the top wall (13) of the spray through cap (2) that exists behind the  
10 central projection (27) rising from said top wall (13). The leaf spring (45) is designed to bear against the substantial bearing wall (28) that forms the extended rear face (28) of the central projection (27) rising from the top wall (13). When the actuator button (6) is pushed forwards, the leaf spring is energised. When the actuator button (6) is released, the leaf spring (45) urges the actuator button (6)  
15 back towards its original position.

From the front of the finger pad (38) there depend two projections (46) that are designed to interact with the two projections (17) that rise from the minor segment  
20 (13B) of the top wall (13) of the spray through cap (2). When the actuator button (6) is pushed forwards, the lower part of the projections (46) depending from the finger pad (38) slide along the top part of the projections (17) that rise the top wall (13) of the spray through cap (2) until said depending projections (46) have gone past said rising projections (17). The raised ridges (18) on the projections (17)  
25 rising from the top wall (13) of the spray through cap (2) serve to guide the projections (46) depending from the finger pad (38) during this process. When said depending projections (46) have gone past said rising projections (17) the actuator button (6) may be depressed.

30 From the rear of the finger pad (38) there depend two struts (47) bearing hinge joints (48) that are designed to fit into the parallel slits (31) located towards the



- 15 -

back of the major segment (13A) of the top wall (13) of the spray through cap (2).

When the actuator is operated, the actuator button (6) is slid forward and the projections (46) depending from the front of the finger pad (38) ride along the  
5 projections (17) that rise from the minor segment (13B) of the top wall (13) of the spray through cap (2). Simultaneous to this, the two orientation clips (40) depending from the finger pad slide forward within the two parallel slits (32) that are present in the major segment (13A) of the top wall (13) located on either side of the central projection (27) and the hinge joints (48) depending from the rear of  
10 the finger pad (38) slide along the parallel slits (31) located towards the back of the major segment (13A) of the top wall (13) of the spray through cap (2). At the same time, the leaf spring (45) becomes energised by pressing against the bearing wall (28).

15 When the projections (46) depending from the front of the finger pad (38) have slid passed the projections (17) that rise from the minor segment (13B) of the top wall (13), the actuator button (6) is able to be depressed. At this time, the hinge joints (48) depending from the rear of the finger pad (38) have reached the restraining clips (30) located towards the back of the major segment (13A) of the top wall  
20 (13). The finger pad (38) is depressed and the keel-shaped structure (43) dependent therefrom bears down upon the resilient area (35) at the top of the vertical segment (33) of the spray channel (15). This causes the spray channel (15) to bear down upon the valve stem (VS) of the container (1) upon which it sits, thereby opening the valve and allowing discharge of the product within the  
25 container (1). During the depression of the vertical segment (33) of the spray channel (15), the angled segment (34) of the spray channel (15) slides downwards within the vault (25) that links the upper segment (20) of the aperture wall to the inner wall (16) and the oval disc (36) at the end of the spray channel (15) slides downwards immediately behind the oval spray aperture (7).

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- 16 -

When pressure is removed from the actuator button (6), the spring associated with the valve stem (VS) of the container (1) forces the spray channel (15) upwards, immediately after which the leaf spring (45) dependent from the finger pad (38) forces the actuator button (6) back to its original position.

Claims

1. A hand-held cylindrical aerosol dispenser comprising an aerosol container and an attached spray through cap, the container having a valve at its top and a waisted section towards its upper end, the upper expansion of the waisted section smoothly continuing into the attached cap, the attached cap reaching a maximum cross-sectional dimension which decreases further up and having:
- 5
- (i) an actuator button located on its surface above its maximum cross-sectional dimension, said button being angled upwards at from 15° to 50°;
- 10
- (ii) a spray aperture on the opposite side of the cap from the actuator button; and
- (iii) an associated spray channel providing a fluid connection between the valve on the container and the spray aperture;
- 15
- the dimensions of the dispenser allowing the consumer to grip the dispenser around the waisted section of the container and, with the same hand, press upon the actuator button with an index finger to operate the dispenser.
- 20
2. An aerosol dispenser according to claim 1, wherein the ratio of the outer diameter of the waist of the container to the distance between the outer diameter of the waist and the centre of the finger pad of the actuator button, measured as the minimum distance along the curved outer surface of the dispenser, is at least 0.42 to 1 and no greater than 0.50 to 1.
- 25
3. An aerosol dispenser according to claim 1 or claim 2, wherein the ratio of the outer diameter of the waist of the container to the diameter of the container at the point where the spray through cap fits onto the container, is at least 1 to 1.15 and no greater than 1 to 1.35, more preferably being at
- 30

- 18 -

least 1 to 1.2 and no greater than 1 to 1.3, and most preferably being 1 to 1.25.

- 5 4. An aerosol dispenser according to one of the preceding claims, wherein the maximum diameter of maximum diameter of the upper part of the dispenser is at the point where the spray through cap fits onto the container.
- 10 5. An aerosol dispenser according to one of the preceding claims, wherein the actuator button is slide operated.
- 15 6. An aerosol dispenser according to any of the proceeding claims, wherein the waist of the container has an outer diameter of from 33 cm to 39 cm and is located at from 75 cm to 81 cm from the centre of a finger pad of the actuator button, measured as the minimum distance along the curved outer surface of the dispenser.
- 20 7. An aerosol dispenser according to any of the preceding claims, wherein the actuator button has a return mechanism.

Fig.1.

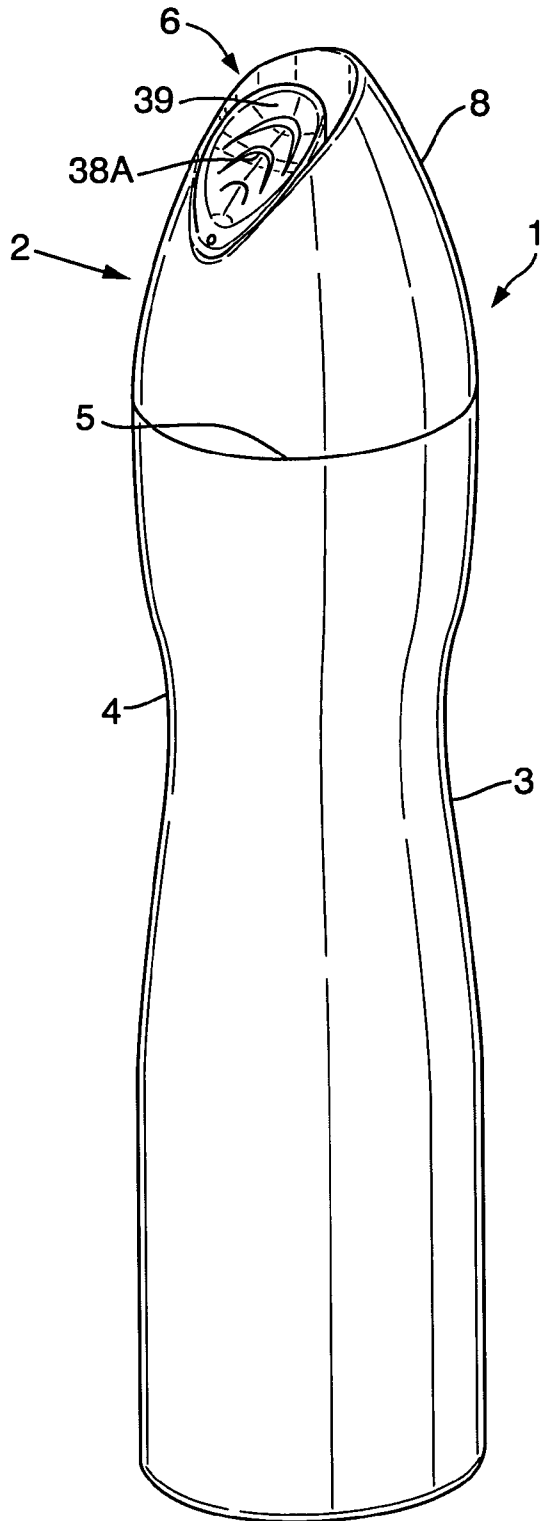
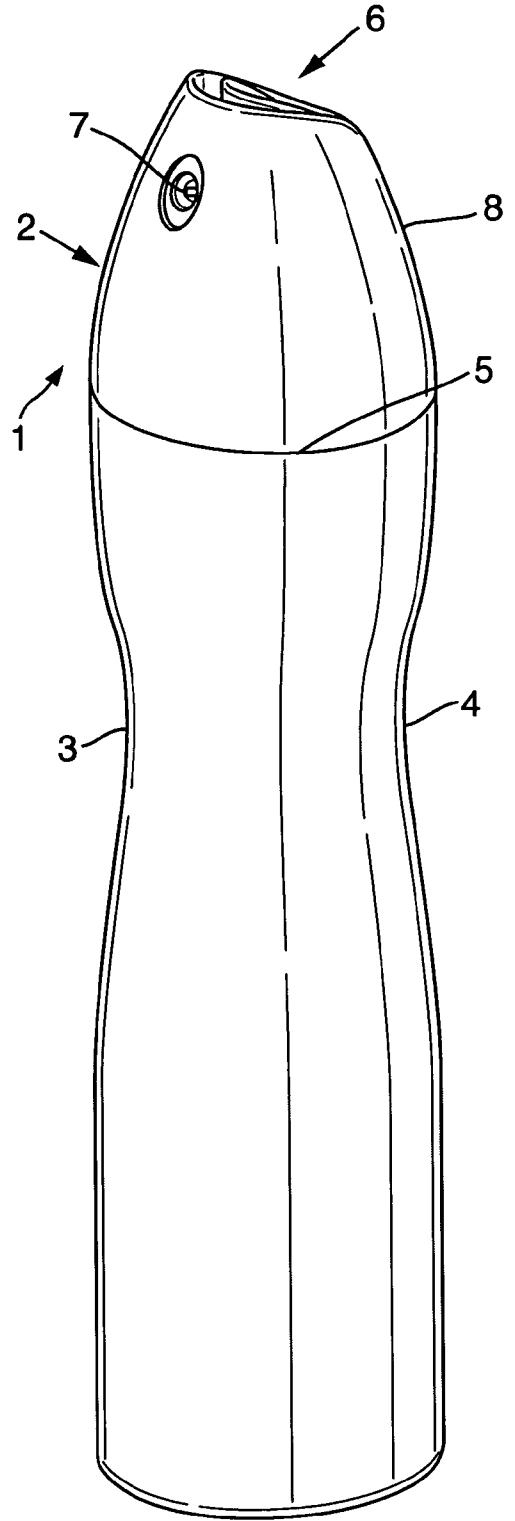


Fig.2.



2/7

Fig.3.

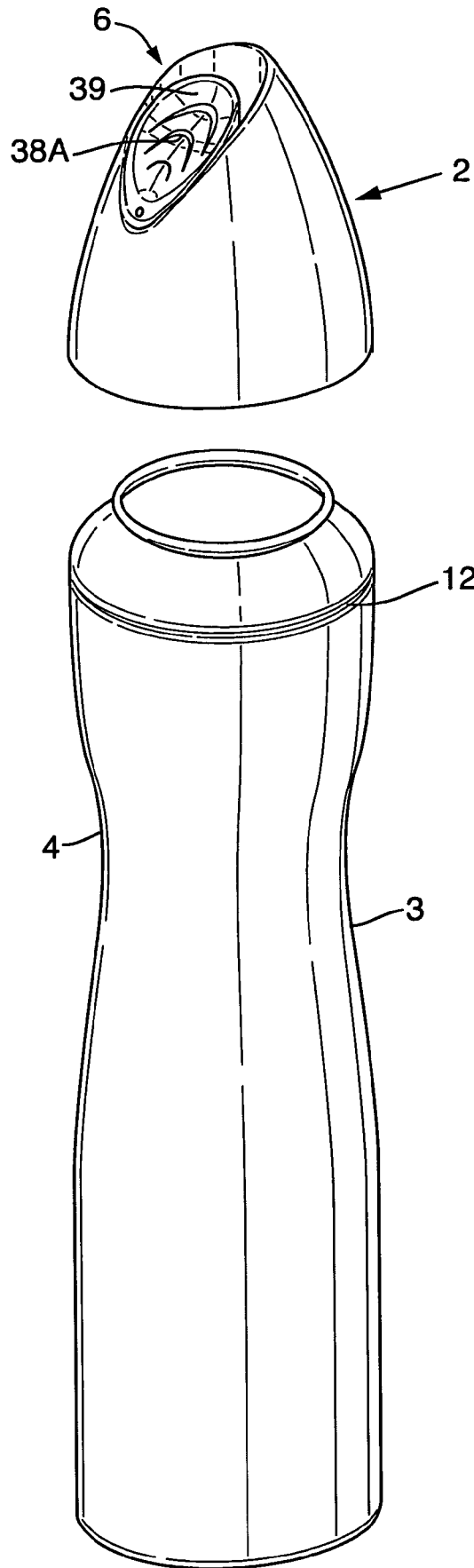


Fig.4.

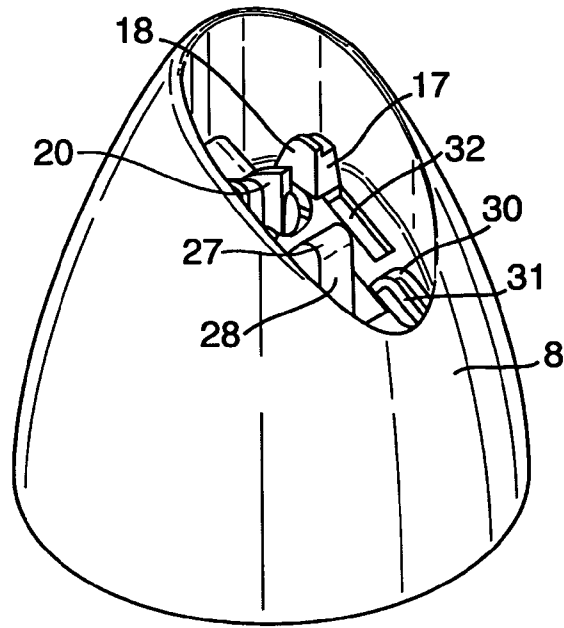


Fig.5.

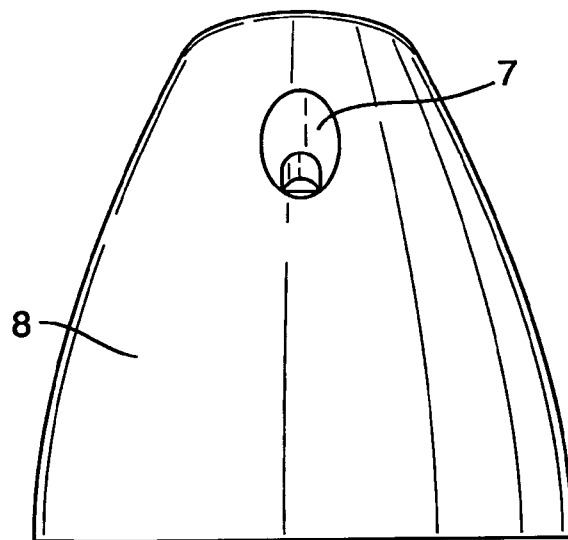


Fig.6.

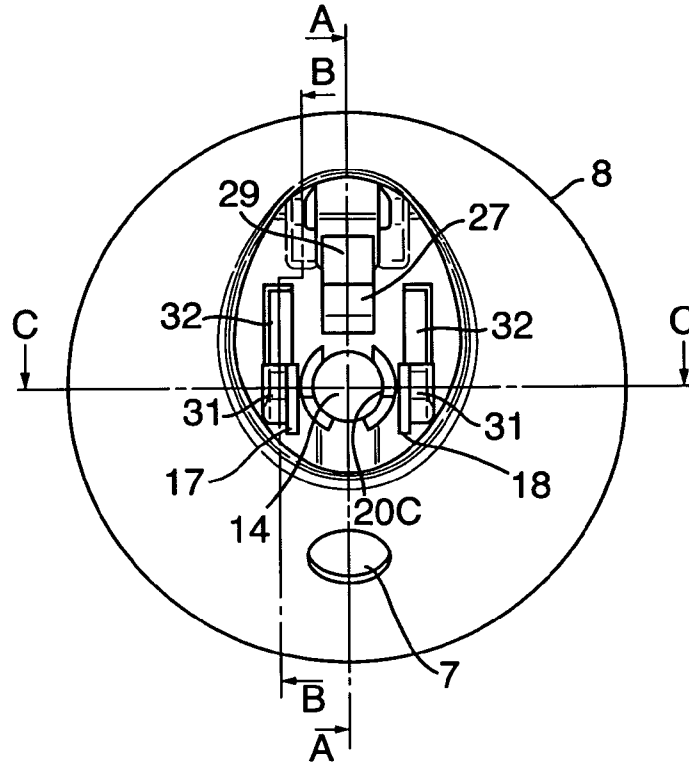


Fig.7.

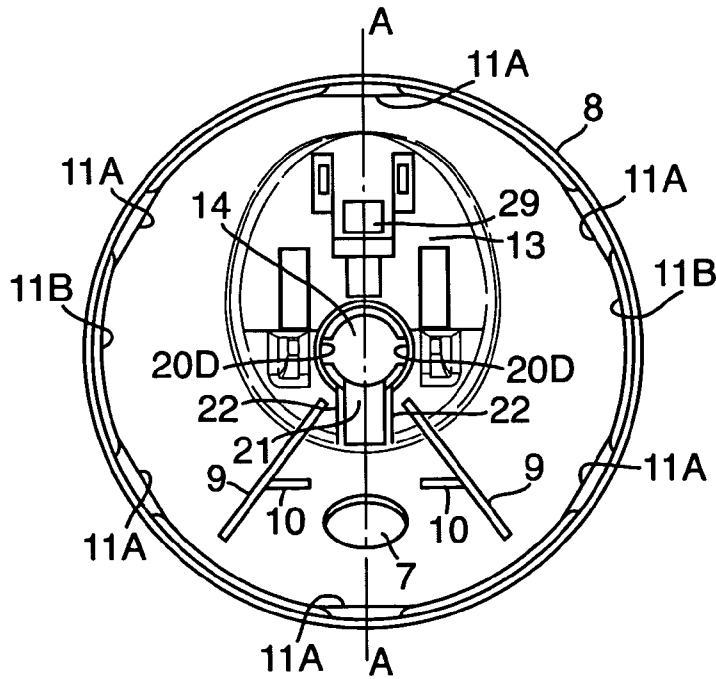




Fig.8.

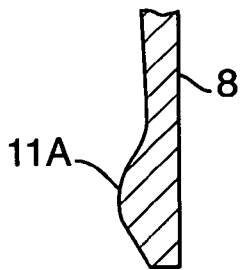


Fig.9.

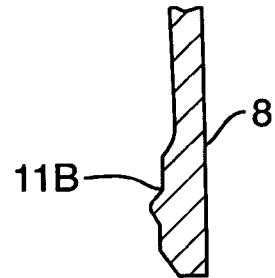


Fig.10.

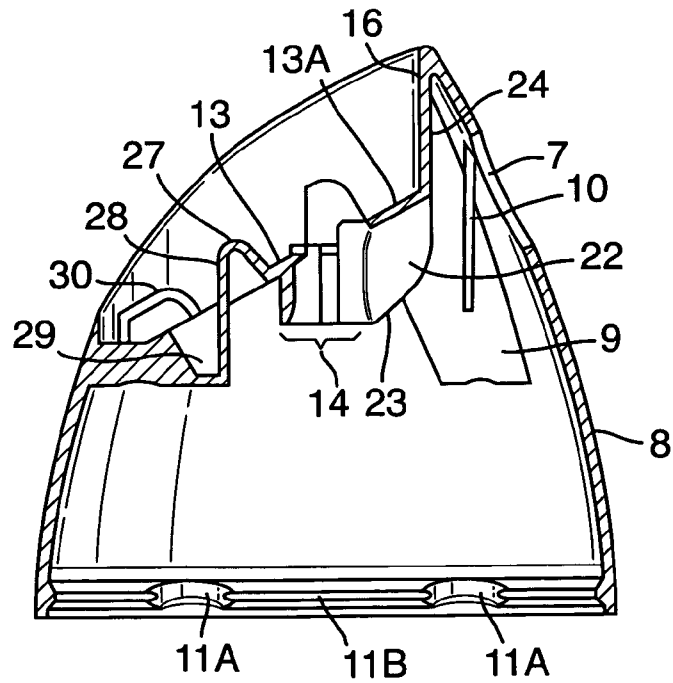


Fig.11.

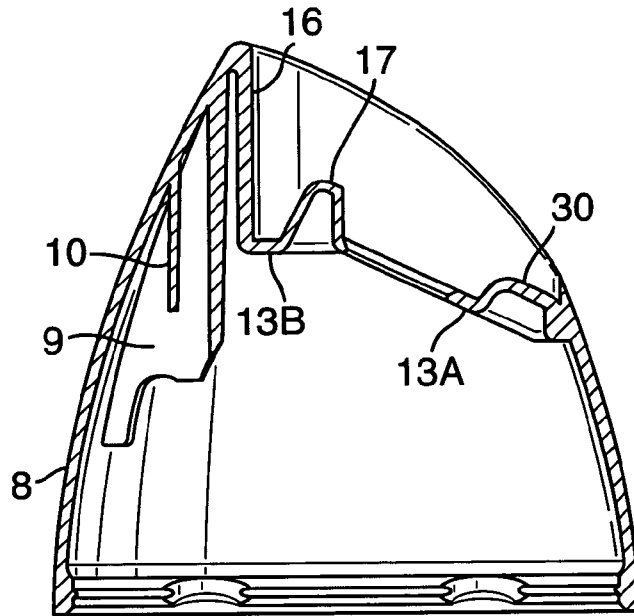


Fig.12.

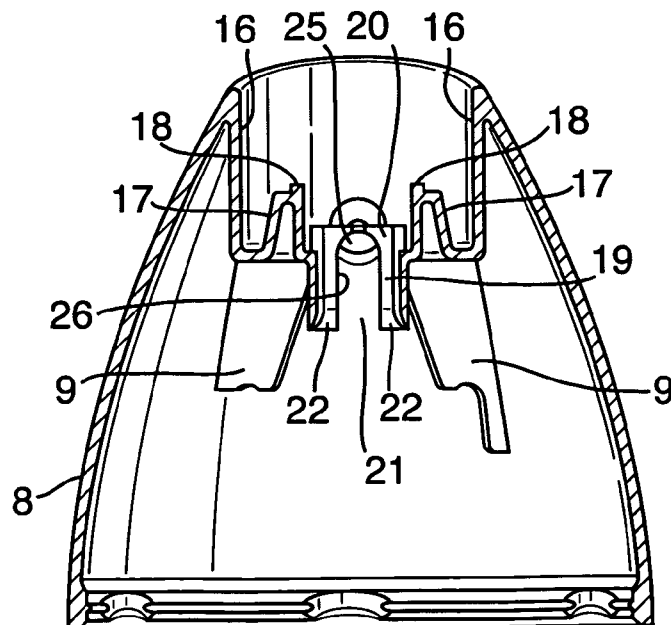


Fig.13.

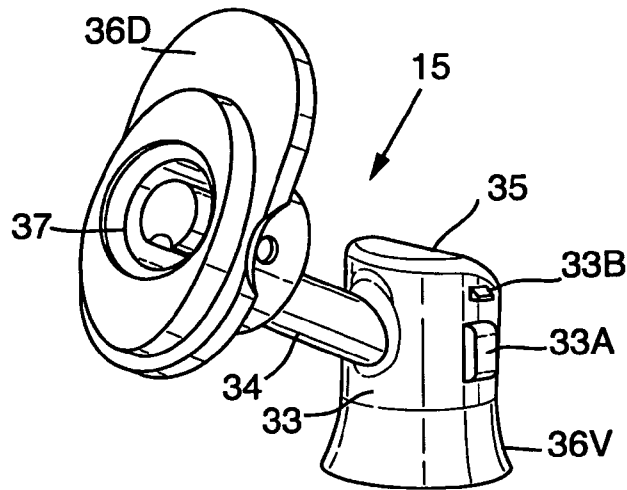
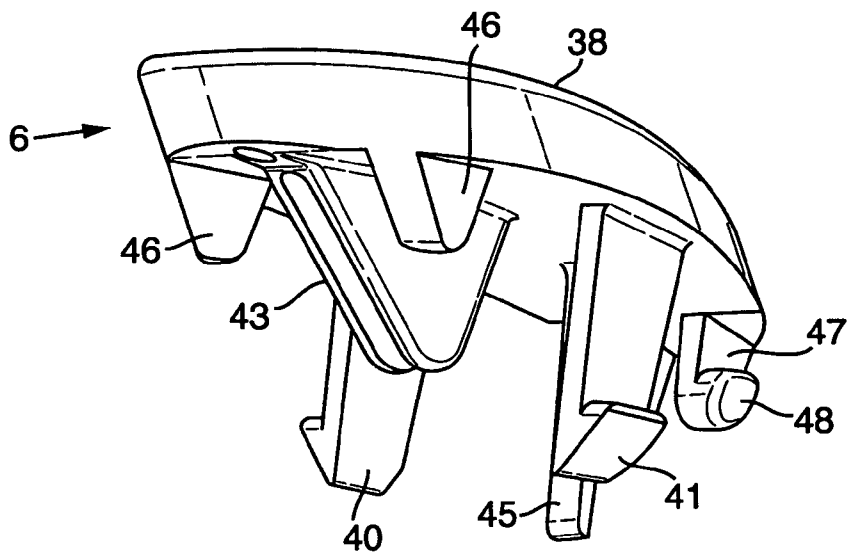


Fig.14.



INTERNATIONAL SEARCH REPORT

International application No  
PCT/EP2009/064314

A. CLASSIFICATION OF SUBJECT MATTER  
INV. B65D83/16 B65D83/14

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Y		5,7
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Y		5,7
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Further documents are listed in the continuation of Box C.

See patent family annex.

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Date of the actual completion of the international search

15 January 2010

Date of mailing of the international search report

03/02/2010

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Authorized officer

Endrizzi, Silvio

## INTERNATIONAL SEARCH REPORT

International application No  
PCT/EP2009/064314

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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Y	paragraphs [0018] - [0021], [0 24]; figures	5,7
X	US 2003/129142 A1 (SCHROEDER KENNETH MICHAEL [US] ET AL) 10 July 2003 (2003-07-10)	1-4,6
Y	figures 7-29	5,7
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