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(21) International Application Number: PCT/US99/22064 (22) International Filing Date: 23 September 1999 (23.09.99) (30) Priority Data: 09/160,996 25 September 1998 (25.09.98) US (71) Applicant: COLGATE-PALMOLIVE COMPANY [US/US]; 300 Park Avenue, New York, NY 10022 (US). (72) Inventors: ZAKSENBERG, Isaac; 950 Raritan Road, Scotch Plains, NJ 07076 (US). NIMMEY, Alan; 18 Sandalwood Drive, Warren, NJ 07059 (US). HARRITY, Kevin; 4 Pierrepont Avenue, Middlesex, NJ 08846 (US). (74) Agent: MC GREAL, Michael, J.; Colgate-Palmolive Company, 909 River Road, P.O. Box 1343, Piscataway, NJ 08855-1343 (US).		(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i>
(54) Title: AN INDIRECTLY ACTIVATED CLOSURE		
(57) Abstract The present closure is one that is actuated and opened indirectly. A force on a push pad (18) causes the lid (25) to open. There is no direct manual force applied to the lid to open the lid. The closure is comprised of a base section (31) and a lid section (25). These are separate molded sections. These separate molded sections are attached after molding. The base section has the attachment (14) to a container, structural integrity, a spout (28), and a lid actuator mechanism. The lid actuator mechanism is comprised of a strap (16) with a push pad (18) with an actuator rod (21) at the end adjacent an actuator wall (23). The lid section (25) has a spout closing section for the spout of the base section and an attachment fitting (42) for attachment to the base section. The spout closing section is attached to the attachment fitting by living hinges (24, 26), and preferably, preloaded living hinges. Such living hinges reduce the force to actuate. The closure is opened by pushing on a push pad (18) which in turn causes the living hinges to be actuated and the lid snap opened. The lid is manually closed.		

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AN INDIRECTLY ACTIVATED CLOSURE

Field of the Invention

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This invention relates to a closure for a container where the closure is opened by applying an indirect force to the lid of the closure. More particularly, this invention relates to a two piece closure that has molded hinges that are preloaded to open a lid upon the application of an indirect
10 force.

Background of the Invention

This invention relates to a closure for a container such as a bottle or
15 a tube where the lid closing the dispensing opening of the closure is opened by applying a force to one surface which translates this force to a second surface which opens the lid. This is in distinction to most closures where the direct force is applied to a lid to open the lid.

20 Typical closures for containers are shown in U.S. Patent 3,516,581; U.S. Patent 4,776,501; and U.S. Patent 4,487,324. Each of these closures is opened by the direct application of a force to the lid of the closure. In U.S. Patent 3,516,581 and U.S. Patent 4,776,501, there are disclosed disc closures. The disc pivots at about a midpoint. By applying a downward
25 force opposite the end covering the dispensing opening, the lid is opened and the dispensing opening uncovered. These are sometimes described as toggle closures. In U.S. Patent 4,487,324 there is disclosed a closure lid that is opened pushing the lid upward to rotate the lid on a set of hinges that connect the lid of the closure to the base of the closure. The lid opens
30 upward to an angle of 90° or better.

These are two of the common closures used on tube packaging and on bottles. These also are examples of common closures where to open the closure there is a direct force applied to the closure. This direct force on a
5 part of the lid of the closure will open the closure.

The new closure of this invention is an indirectly opening closure. A force is applied to one surface of the closure which transfers this force to another part of the closure which opens the lid. The lid is manually closed.
10 The closure is formed in two pieces. The base portion of the lid has portion for attachment to a container and an elongated actuator section comprising an elongated rod that has one or more hinges and terminates in a section that is in a close relationship with an actuator wall. The actuator wall is attached to the dispensing opening lid by a hinge, preferably a preloaded
15 living hinge. When a force is applied to the actuator section, the force is translated to actuator wall and thereby to open the lid.

The base portion with the actuator section preferably is molded in one piece. The lid also preferably is separately molded with the hinge of the
20 lid being preloaded during molding. By preloaded is meant that the hinge is set so that a small force and movement of the actuator wall of the lid will cause the lid to spring open.

This type of closure has the advantage that is easy to open, requiring
25 less force than the direct opening closures. It is very useful for persons who through age or otherwise do not have a high level of strength in their hands.

Brief Summary of the Invention

The present invention is directed to an indirectly activated closure for a container, such as a tube or a bottle. The closure is opened by
5 applying a force to one surface of the closure, which force is transferred to a part of a lid assembly which then opens the lid. This invention also is directed to the assembly and use of this closure.

The closure has a base portion and a lid portion. The lid portion is
10 attached to the base portion by an interfitting closure attaching section. The base portion has a section for attachment to a container, a dispensing opening and a list activation section. The lid section has an activator wall, a lid hinge, and preferably a pre-loaded living hinge, and portion closing the dispensing opening. In use a force is applied to the lid activation section
15 which causes and activator rod to contact the activator wall to in turn cause the lid hinge to open and open the dispenser opening.

The closure is produced in two sections. The base section and the lid section. The lid section is attached to the base section and the activator
20 section is folded into place with the actuator rod adjacent the actuator wall of the lid section. The closure then can be attached to a container.

The closure is activated by applying a force to the activator section which in turn applies the force to the activator wall of the lid section. Upon
25 applying this force to the activator wall the lid opens. The lid is manually closed after dispensing.

Brief Description of the Drawings

Figure 1 is a perspective view of the closure of the indirectly opening closure of the present invention.

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Figure 2 is a perspective view of the closure of Figure 1 in an opened condition.

Figure 3 is a vertical cross-section of the closure of Figure 1 along 3-3.

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Figure 4 is a vertical cross-section of the closure of Figure 1 opened.

Figure 5 is a vertical cross-section of an alternate embodiment of the structure of Figure 3.

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Figure 6 is an exploded view of the two sections that comprise the closure.

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Detailed Description of the Invention

The present indirectly opening closure is comprised of two sections. There is the base section and the lid section. The lid section and the base section are separately molded with the lid section interfitted onto the base section. These sections are conveniently injection molded from any of the commonly used injection molding resins. These include the polyolefins such as the polyethylene and the polypropylenes.

Figure 1 describes the closure in more detail. The closure 10 is comprised of base section 12 and lid section 22. A lower part of the base

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section is the container connecting portion 14. This is shown as an interfitting arrangement. However, this can be threaded or latched to a container. In such embodiments the container would have a cooperating thread or latching arrangement.

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As is seen in **Figures 1 through 3** the base section in addition to the connecting portion 14 is comprised of strap 16 which has push pad 18 and actuator rod 20. The actuator rod has a lid contact section 21. The actuator rod has hinge points at 32 and 34. Located under the strap 16 is
10 base support member 36. This base support member provides rigidity to the closure and supports the pin 40 for attachment of the lid section. It also supports lever spring 38. This lever spring 38 causes the strap 16 to recede to its original position after opening the lid 22. Adjustment section 19 provides an offset for the actuator rod 21. The actuator rod can be at
15 various levels so as to contact actuator wall 23 at an optimum point.

As shown in **Figure 2** the base carries spout 28 that has dispensing aperture 30. The lid section 22 closes spout 28. The lid section has a top wall 25 and a sidewall 27. Circumferential section 29 encircles spout 28 to
20 seal the spout in a closed condition. The lid section also has downwardly depending actuator wall 23 and a lid attachment fitting 42 which latches onto connecting pin 40 of the base portion. These comprise the lid attachment section. Hinges 24 and 26 attach the lid top wall 25 to the lid attachment fitting 42. This attachment is shown in **Figures 3-6** and in
25 detail in **Figure 6**.

In **Figure 3** there is shown the closure in a vertical cross-section. Here the lid 22 is closed. However, all of the described principal parts of the closure are shown in detail. In order to open the closure as shown in
30 **Figures 2 and 4**, actuator rod 21 is pushed against actuator wall 23. This

causes the movement of the actuator wall 23 towards spout 28. This in turn causes the lid 27 to open on hinges 24 and 26. This is shown in detail in Figure 4. The force to cause lid contact section of actuator rod 21 to contact the actuator wall 23 is a force on push pad 18 moving the push pad
5 towards spring 38. A slight force on the push pad is sufficient to move the actuator rod the short distance to open the lid 22.

Figure 5 shows an alternate construction for the actuator wall 23(a). Also, in this embodiment actuator rod 21(a) is extended downward
10 to contact the actuator rod at a lower point. Otherwise the structure of the closure of Figure 5 is substantially similar to that of Figure 3.

Figure 6 discloses the closure of Figure 3 in an exploded view. The closure also is injection molded in the two sections shown in this view.
15 After molding the attachment fitting attaches to the pin 40. The pin 40 has an enlarged head portion which is accepted into an attachment fitting 42 with an enlarged internal section. These mating sections snap into place to hold the lid section onto the base section. Assembly is easy and quick.

20 The hinges on the lid section preferably are in the form of a preloaded living hinge. A living hinge is one which after a partial movement to open or close the hinge, the hinge will snap to an open or to a substantially closed position. Such hinges are commonly used on many personal care packages including shampoos, lotions and dentifrices. A
25 preloaded living hinge is one where the stretched hinges are preloaded. That is, the hinges are formed with the lid partially closed. This is shown in Figure 7. In this view pivot hinges 26 and stressed hinges 24 are molded in this manner so that a small movement of actuator wall 23 will cause the lid to open. Depending on the angle of the stressed hinges from
30 0° to the horizontal to the $\pm 30^\circ$ to the horizontal the degree of force, and the

travel required for the actuator wall to open the lid can be adjusted. In the present instance it is desired to minimize the travel distance of actuator wall 23 and hence, the force to actuate. It is desired to minimize the force to actuate.

5

This description and the drawings set out a preferred embodiment of the closure. Various modifications can be made and yet maintain the feature of an indirect opening of the closure and a low force to actuate. As noted, a low force to actuate is needed for people with low hand strength.

10 All such modifications which embody the inventive concepts disclosed herein are within the scope of the present invention.

Claims

What is claimed is:

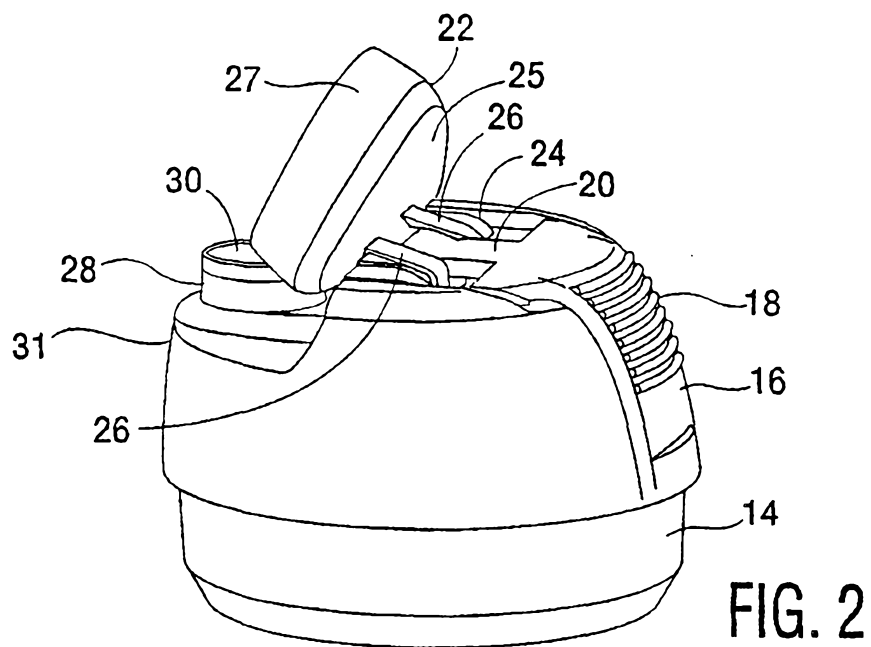
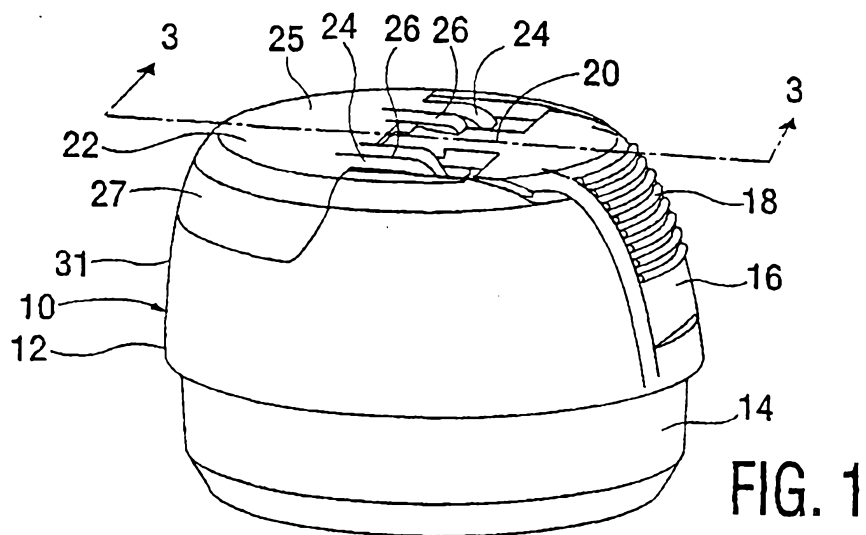
- 5 1. An indirectly activated closure comprising a base section and a lid section, means at one end of said base section attaching said base section to a container, and at said other end to attach said lid section, said lid section closing a dispensing aperture in said base section, an actuator integrally connected to said base section, a first part of said
10 actuator adjacent said lid section and a second part of said actuator contacted by the finger of a user to move said actuator whereby when said actuator is moved said first part of said actuator contacts said lid section and causes a closing device portion of said lid section to retract and to open said dispensing aperture.
- 15 2. An indirectly activated closure as in claim 1 wherein said actuator is comprised of a strap which extends upwardly of said base section and across at least a portion of a top part of said base section.
- 20 3. An indirectly activated closure as in claim 1 wherein said lid section has an interfitting lid attaching section that interfits with a base section attaching section, and an actuator wall between said lid attaching section and said closing device, said actuator comprising an actuator strap with an actuator rod adjacent said actuator wall and
25 attached to said base section, said actuator strap having at least one hinge and pivoting at said at least one hinge, and an end of said actuator rod adjacent said actuator wall whereby when said actuator rod is moved toward said actuator wall, said actuator rod causes said actuator wall to move upwardly and to cause said closing device to
30 move out of contact with said aperture to open said aperture.

4. An indirectly activated closure as in claim 3 wherein said actuator strap has at least two hinges.
- 5 5. An indirectly activated closure as in claim 3 wherein said actuator strap has a portion intermediate said at least one hinge and the end of said actuator rod adjacent said actuator wall for moving said actuator rod inwardly toward said base portion to cause the end of said actuator rod to contact said actuator wall.
- 10 6. An indirectly activated closure as in claim 5 wherein there is a spring device on said base section adjacent said actuator strap, said spring device contacting said actuator strap when said actuator rod is activated to contact said actuator wall to return said actuator rod to
- 15 a position where it is not in contact with said actuator wall.
7. An indirectly activated closure are in claim 5 wherein there is an actuator strap support pin on a top part of said base section, said actuator rod contacting and being supported on the support pin.
- 20 8. An indirectly activated closure as in claim 3 wherein said lid section has a living hinge intermediate said lid attachment section and said closing device.
- 25 9. An indirectly activated closure as in claim 8 wherein said living hinge is adjacent said lid attachment section.
10. An indirectly activated closure as in claim 1 wherein said dispensing aperture is parallel to the vertical axis of said base portion.

11. An indirectly activated closure as in claim 1 wherein said dispensing aperture is at an angle to the vertical axis of said base portion.
12. An indirectly activated closure as in claim 1 wherein said lid
5 attaching section comprises a socket adapted to accept to receive a pin extending upwardly from said base section.
13. An indirectly activated closure as in claim 6 wherein adjacent said at
10 least one hinge of said actuator strap there is a thickened portion that contacts said spring device.
14. A method of assembling an indirectly activated closure comprising
15 providing a closure having a lid section and a base section, assembling said lid section onto a top part of said base section and placing a closing device of said lid section in alignment with an aperture opening in said base section for dispensing a substance,
20 folding an actuator strap hingedly connected to a lower part of said base section upwardly along said base section and over a portion of said top part of said base section whereby an actuator rod at the end of said strap is adjacent an actuator wall of said lid section.
15. A method of assembling an indirectly activated closure as in claim 12 wherein said actuator strap is folded at a second hinge.
- 25 16. A method of activating the indirectly activated closure of claim 1 comprising pushing inwardly on a portion of said actuator in a region substantially opposite said dispensing aperture of said closure to move said actuator toward said dispensing aperture and thereby
30 cause said closing device closing said dispensing aperture to open and extend upwardly.

17. A method of activating an indirectly activated closure as in claim 16 comprising manually closing said closing device by rotating said closing device on a hinge downwardly and into contact with said dispensing aperture.
- 5

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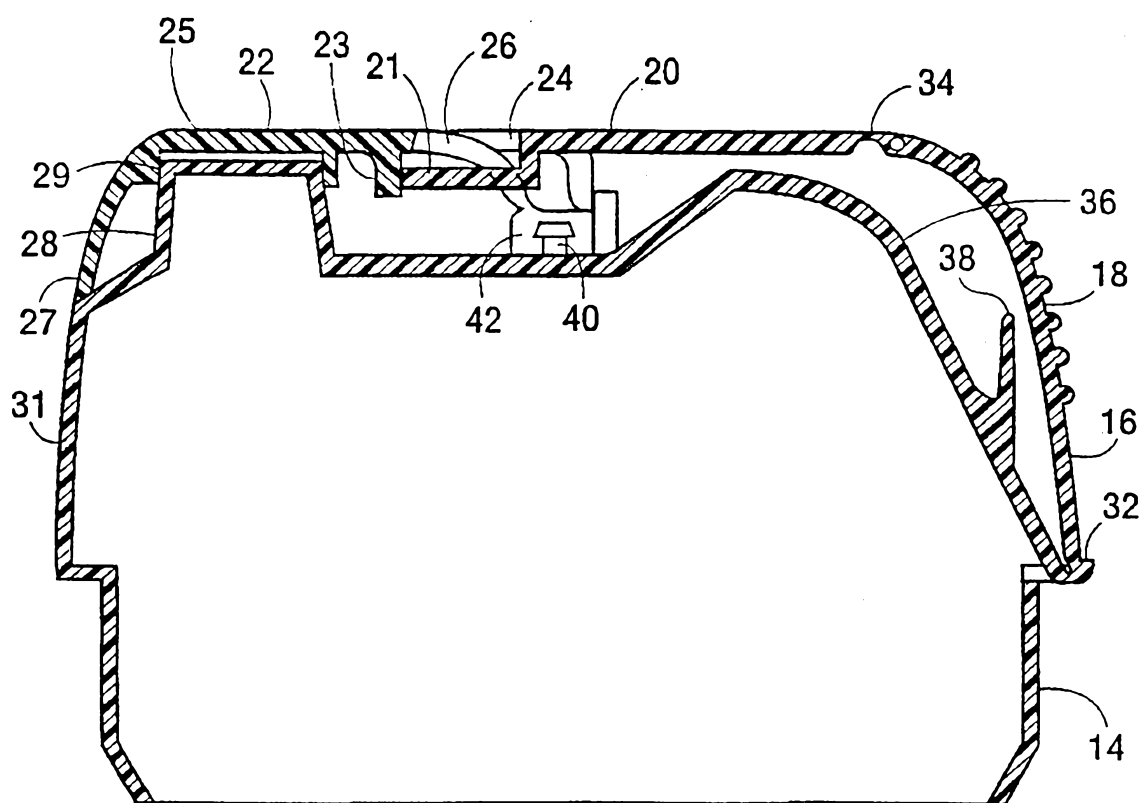


FIG. 3

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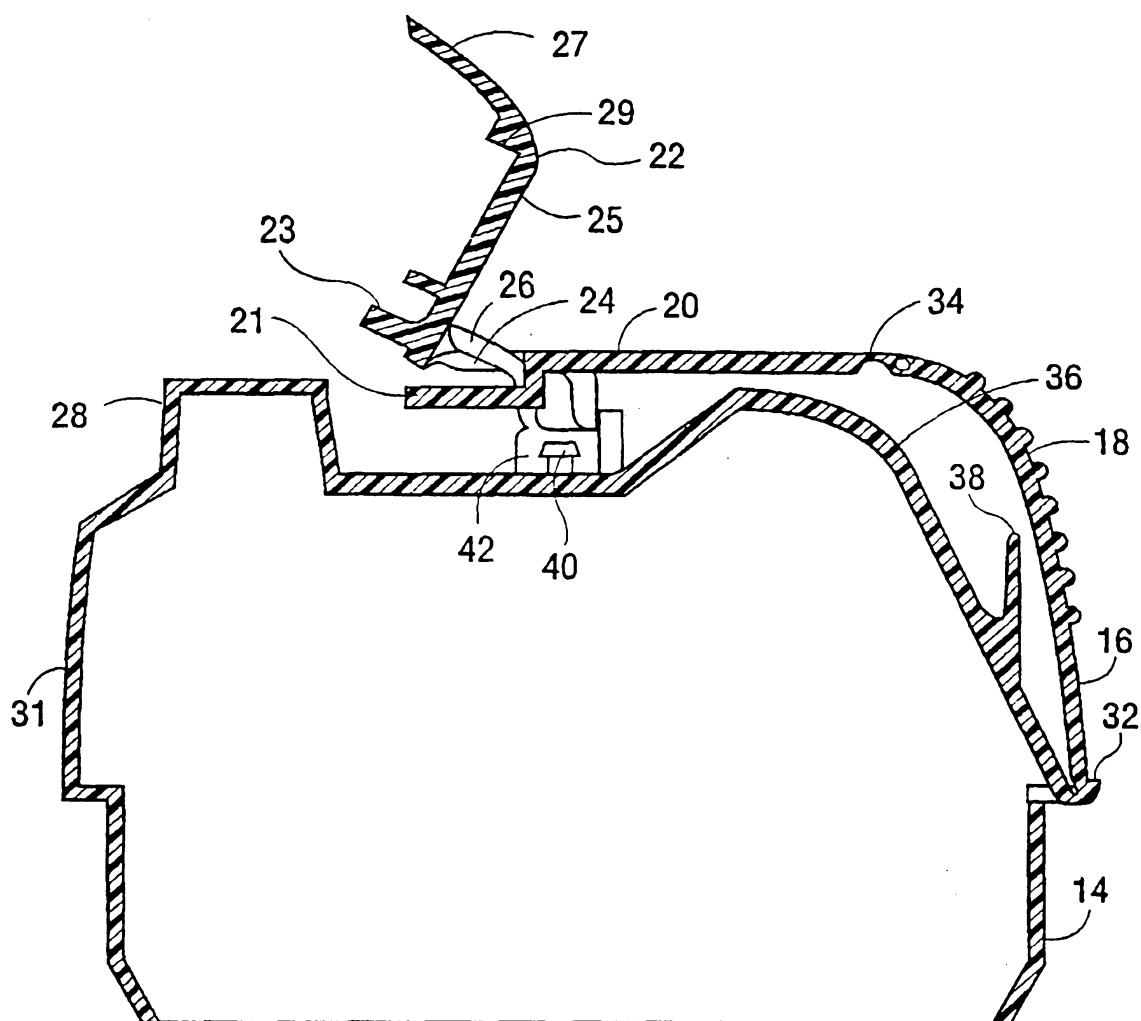


FIG. 4

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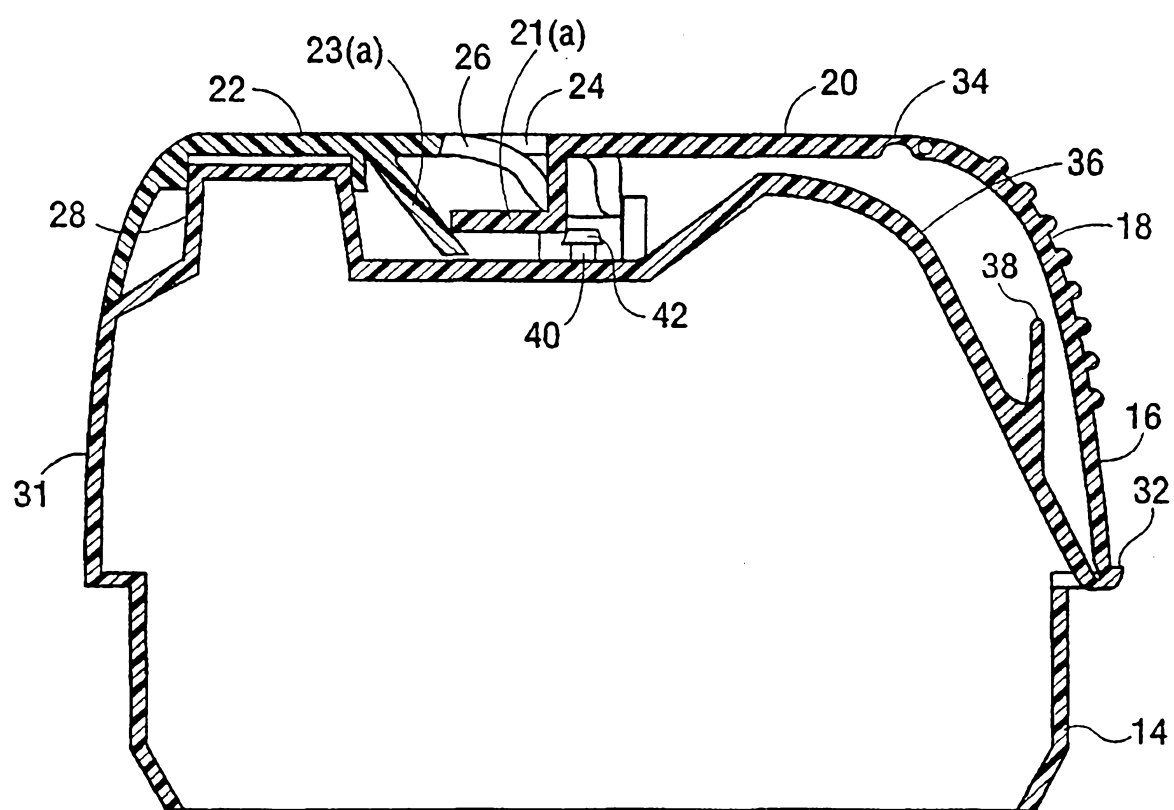


FIG. 5

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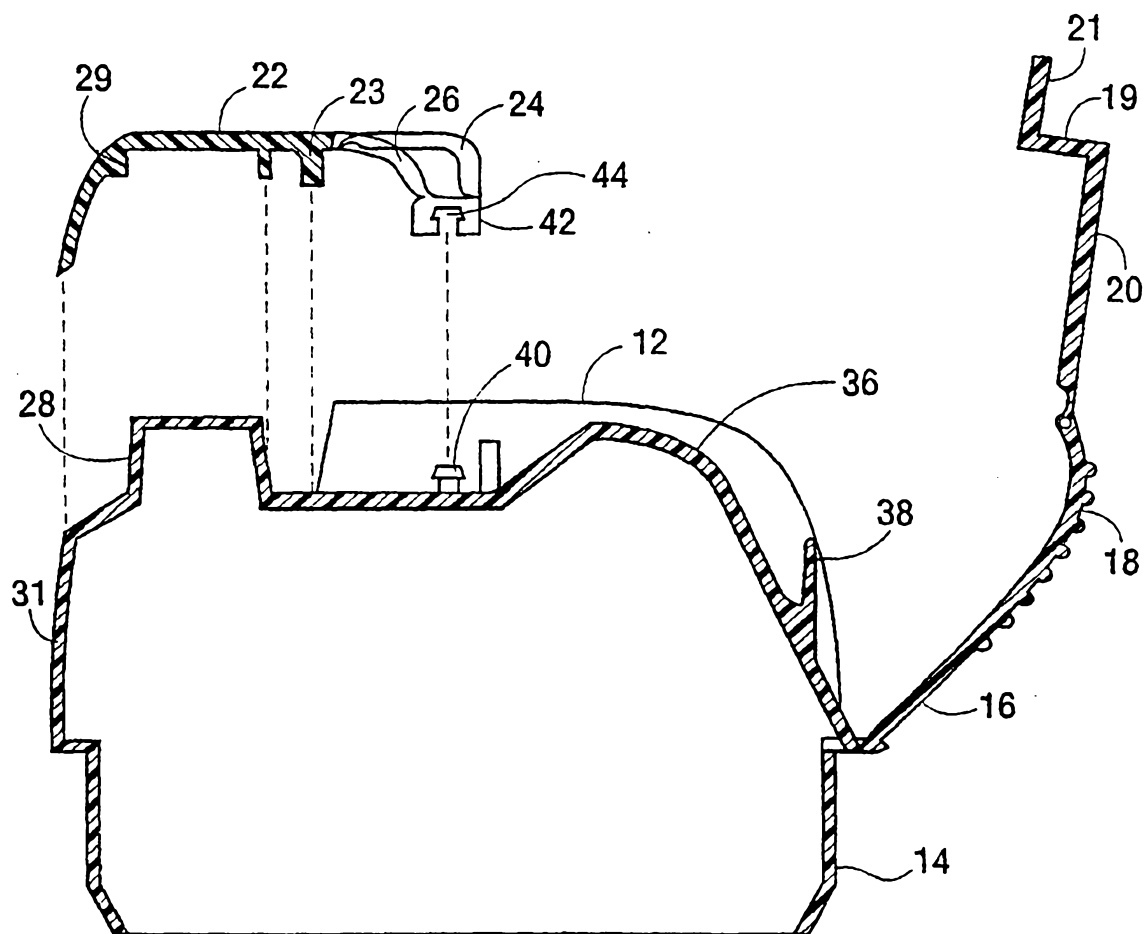


FIG. 6