HINGED DISPENSING CLOSURE WITH CHILD-RESISTANT INTERLOCK

Inventors: Valentin Hierzer, Arlington Heights, IL (US); David Ziegenhorn, Grayslake, IL (US)

Correspondence Address:
Knoble & Yoshida, LLC
Eight Penn Center, Suite 1350
1628 John F. Kennedy Blvd.
Philadelphia, PA 19103 (US)

Appl. No.: 10/452,452
Filed: Jun. 2, 2003

Publication Classification

Int. Cl. 7 .......................... B65D 55/02
U.S. Cl. ................. 220/256.1; 215/204; 215/223

ABSTRACT

A closure for a container includes a main body portion that is constructed and arranged to be secured to a container and that has dispensing orifice defined therein for dispensing a liquid. The closure further includes a first lid portion that is hingedly mounted to the main body portion and is movable between a first, open position wherein material may be dispensed from the container through the dispensing orifice and a second, closed position wherein the dispensing orifice is blocked. A second lid portion overlies the first lid portion and is mounted for rotation with respect to the first lid portion. The second lid portion is rotatable between an unlocked position and a locked position wherein it engages the main body portion to prevent movement of the first lid portion away from the second, closed position. Pedestal bearing structure is advantageously mounted to one of the first and second lid portions that has a bearing surface that is positioned to engage the other of the first and second lid portions for reducing rotational friction between the first lid portion and the second lid portion.
HINGED DISPENSING CLOSURE WITH CHILD-RESISTANT INTERLOCK

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] This invention generally relates to a dispensing closure of the type that has a hinged reclosable lid that may be swung open to reveal a dispensing orifice for the closure. More specifically, this invention relates to a child resistant dispensing closure of the type that includes an interlock for preventing the lid from being opened unless a specific additional force is imparted to the closure.

[0003] 2. Description of the Related Technology

[0004] WO 97/37900 describes a hinged dispensing closure in which the lid portion is formed of a first stationary component and a second component that is relatively rotatable with respect to the first stationary component. The second component is biased toward a resting rotational position relative to the first stationary component. The movement of the closure so as to prevent the lid from moving relative to the closure. In order to swing the lid away from the closure, the second component must be rotationally displaced by twisting it with respect to the first component, which disengages the second component from the main body portion. The required twisting action is intended to provide a level of child resistance to the closure.

[0005] In order for the closure described in WO 97/37900 to function effectively, the second, rotatable component of the lid portion must be shaped and sized so that a consumer can grip and twist it relative to the rest of the closure. Unfortunately, it was felt that it would be relatively difficult for consumers to adequately grip the rotatable upper portion of the lid portion of the closure that is described in the reference. This situation could have been addressed by increasing the thickness of the first stationary component of the lid portion, but this would have substantially increased material costs and potentially interfered with the functionality of the closure. Another potential solution might have been to increase the size of the second rotatable component, but this would also increase material costs as well as potentially adversely affect the stability of the interface between the first and second components of the lid portion.

[0006] A need existed for a child resistant change dispensing closure that may conveniently be operated by a consumer, is material efficient, and is dimensionally stable.

SUMMARY OF THE INVENTION

[0007] Accordingly, it is an object of the invention to provide a child resistant change dispensing closure that may conveniently be operated by a consumer, is material efficient, and is dimensionally stable.

[0008] In order to achieve the above and other objects of the invention, a closure for a container that is constructed according to a first aspect of the invention includes a main body portion that is constructed and arranged to be secured to a container, the main body portion having a dispensing orifice defined therein; a first lid portion that is hingedly mounted to the main body portion and movable between a first, open position wherein material may be dispensed from the container through the orifice and a second, closed position wherein the orifice is blocked; a second lid portion that overlies the first lid portion and is mounted for rotation with respect to the first lid portion, the second lid portion being rotatable between an unlocked position and a locked position wherein the second lid portion engages the main body portion to prevent movement of the first lid portion away from second, closed position; and pedestal bearing structure mounted to one of the first and second lid portions, the pedestal bearing structure having a bearing surface that is positioned to engage the other of first and second lid portions for reducing rotational friction between the first lid portion and the second lid portion.

[0009] These and various other advantages and features of novelty that characterize the invention are pointed out with particularity in the claims annexed hereto and forming a part hereof. However, for a better understanding of the invention, its advantages, and the objects obtained by its use, reference should be made to the drawings which form a further part hereof, and to the accompanying descriptive matter, in which there is illustrated and described a preferred embodiment of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] FIG. 1 is a perspective view depicting a closure that is constructed according to a preferred embodiment of the invention;

[0011] FIG. 2 is a fragmentary perspective view depicting one portion of the closure that is shown in FIG. 1;

[0012] FIG. 3 is another fragmentary perspective view depicting another portion of the closure that is shown in FIG. 1;

[0013] FIG. 4 is a top plan view of one component of the closure that is shown in FIGS. 1-3; and

[0014] FIG. 5 is a top plan view of a component in a closure that is constructed according to an alternative embodiment of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT(S)

[0015] Referring now to the drawings, wherein like reference numerals designate corresponding structure throughout the views, and referring in particular to FIG. 1, a closure 10 that is constructed according to a preferred embodiment of the invention includes a main body portion 12 that is constructed and arranged to be secured to a container in conventional fashion. Main body portion 12 has a dispensing orifice 14 defined therein through which liquid material may be dispensed from a container when the closure 10 is opened.

[0016] For purposes that will be described in greater detail below, main body portion 12 further includes the bead 16 defining a protruding lip portion 18 and a recess 20 that is positioned immediately beneath the protruding lip portion 18. Closure 10 further includes a lid 22 that is connected to main body portion 12 by an integral hinge 24. Lid 22 includes a stationary lid portion 26 and a second rotatable lid portion 28 that is mounted for rotation relative to the first stationary lid portion 26. A plug 30 is mounted within the first stationary lid portion 26 for sealing the
dispensing orifice 14 when the closure 10 is closed, as may readily be visualized by viewing FIG. 1.

[0017] The first stationary lid portion 26 further includes biasing structure 32 for biasing the second rotatable lid portion 28 toward a locked position, as will be described in greater detail below. In the preferred embodiment, biasing structure 32 is a spring element 34 that is unitarily molded into the first stationary lid portion 26 and that has an opening 36 defined therein. Referring briefly to FIG. 4, opening 36 is sized and positioned to engage a pin 40 that is unitarily molded into the second rotatable lid portion 28. Referring to FIG. 2, it will be seen that the first stationary lid portion 26 has a substantially flat and smooth upper bearing surface 38 facing the second rotatable lid portion 28. A rounded upwardly extending projection 40 is defined in the geometric center of the smooth upper bearing surface 38. Upwardly extending projection 40 is thus positioned so as to intersect with the axis of rotation of the second rotatable lid portion 28 relative to stationary lid portion 26.

[0018] Looking now to FIG. 3, it will be seen that the second rotatable lid portion 28 includes interlock structure 42 for releasably engaging the bead structure 16 on the main body portion 12 of the closure 10. In the preferred embodiment, interlock structure 42 includes a downwardly extending projection 44 that, as is best shown in FIG. 4, has a first end 46 and a second end 48, the second end 48 being closer to the center of rotation of the second rotatable lid portion 28 than the first end 46. When the closure 10 is closed and the second rotatable lid portion 28 is biased toward the locked position, the protruding lip 18 of the bead structure 16 on the main body portion 12 of the closure 10 will be positioned within a recess 50 that is defined within the projection 44 of the second rotatable lid portion 28, as is shown in FIG. 3. This effectively prevents the lid 22 from being lifted relative to the main body portion 12, providing a measure of child resistance. However, when the second rotatable lid portion 28 is twisted by a consumer relative to the first stationary lid portion 26 (which will be in a counterclockwise direction as viewed in FIG. 4), projection 44 will clear the protruding lip 18 of the bead structure 16, thereby permitting the lid 22 to be lifted away from the main body portion 12.

[0019] As may further be seen in FIG. 3, the second rotatable lid portion 28 has a downwardly extending outer apron 52 that overlies the first stationary lid portion 26 and that has a grip surface 54 defined on a circumferential outer surface thereof. The circumferential gripping surface 54 preferably has a height that is preferably at least 0.25 inches.

[0020] A radially inwardly extending bead that is unitary with apron 52 defines sidewall bearing structure 56 that engages the first stationary lid portion 26 and stabilizes relative movement between the lid portions 26, 28. According to one particularly advantageous feature of the invention, pedestal bearing structure 58 is mounted to one of the first and second lid portions 26, 28. The pedestal bearing structure 58 has a convex bearing surface 66 that is positioned to engage the other of the first and second lid portions 28, 26 for reducing rotational friction between the first lid portion and the second lid portion. Preferably, the pedestal bearing structure 58 pedestal bearing means is shaped as to be symmetrical about an axis of relative rotation between the first and second lid portions 26, 28 and includes a plurality, preferably at least three, radially extending arm members in order to provide dimensional stability between the lid portions 26, 28. In the preferred embodiment of the invention, pedestal bearing structure 58 is mounted to the second rotatable lid portion 28 and includes first and second cross members 60, 62 that are molded unitarily into the inner surface of the lid portion 28 and that extend vertically elevated from the inner surface by a predetermined distance so as to permit a corresponding increase in the vertical dimension of the apron 52 without requiring a great deal of additional plastic material. This predetermined distance is preferably at least 0.062 inches, and more preferably at least 0.09 inches.

[0021] Advantageously, locating structure is provided in the pedestal bearing structure 58 for centering the second lid portion 28 with respect to the first stationary lid portion 26. In the preferred embodiment, this locating structure is formed as centering structure that is defined in the first and second cross members 60, 62, specifically a cup like recess 64 that is shaped and sized to receive the rounded projection 40 that is defined in the first stationary lid portion 26.

[0022] It is to be understood, however, that even though numerous characteristics and advantages of the present invention have been set forth in the foregoing description, together with details of the structure and function of the invention, the disclosure is illustrative only, and changes may be made in detail, especially in matters of shape, size and arrangement of parts within the principles of the invention to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.

What is claimed is:

1. A closure for a container, comprising:
   a. a main body portion that is constructed and arranged to be secured to a container, said main body portion having a dispensing orifice defined therein;
   b. a first lid portion, said first lid portion being hingedly mounted to said main body portion and being moveable between a first, open position wherein material may be dispensed from the container through said orifice and a second, closed position wherein said orifice is blocked;
   c. a second lid portion that overlies said first lid portion and is mounted for rotation with respect to said first lid portion, said second lid portion being rotatable between an unlocked position and a locked position wherein said second lid portion engages said main body portion to prevent movement of said first lid portion away from said second, closed position; and
   d. pedestal bearing means mounted to one of said first and second lid portions, said pedestal bearing means having a bearing surface that is positioned to engage the other of said first and second lid portions for reducing rotational friction between said first lid portion and said second lid portion.

2. A closure for a container according to claim 1, wherein said pedestal bearing means comprises a plurality of radially extending arm members.

3. A closure for a container according to claim 2, wherein said pedestal bearing means comprises at least three of said radially extending arm members.

4. A closure for a container according to claim 1, further comprising locating means for centering said second lid portion with respect to said first lid portion.
5. A closure for a container according to claim 4, wherein said locating means is integral with said pedestal bearing means.

6. A closure for a container according to claim 1, wherein said pedestal bearing means is mounted on said second lid portion.

7. A closure for a container according to claim 6, wherein said pedestal bearing means is unitary with said second lid portion.

8. A closure for a container according to claim 1, wherein said pedestal bearing means comprises a convex bearing surface for minimizing area contact between said pedestal bearing means and the other of said first and second lid portions.

9. A closure for a container according to claim 1, wherein said pedestal bearing means is shaped as to be symmetrical about an axis of relative rotation between said first and second lid portions.

10. A closure for a container according to claim 1, wherein said pedestal bearing means has a height of at least 0.062 inches.

11. A closure for a container according to claim 10, wherein said pedestal bearing means has a height of at least 0.09 inches.

12. A closure for a container according to claim 1, further comprising biasing means for biasing said second lid portion toward said locked position.

13. A closure for a container according to claim 12, wherein said second lid portion has a downwardly extending outer apron, said outer apron having an outer circumferential gripping surface thereon.

14. A closure for a container according to claim 13, wherein said circumferential gripping surface has a height of at least 0.25 inches.

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