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B8T TWH

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EP 0658482 A1 **WO 1994/029184 A1**
US 4776501 A **US 4441637 A**

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INT CL **A47G, B65D**
Other: **OPTICS, EPODOC, WPI**

(54) Abstract Title: **A dispensing closure**

(57) A closure (10) for a container having an open end is provided. The closure comprises a base (20) and a cooperating disc-like lid (30). The closure is formed from injection moulded plastics material and provides a dispensing passage (40). The lid and base are provided with interconnection means (60, 76), such that the lid has limited rocking movement with respect to the base between a closed position in which the passage is isolated from the interior of the container and an open position in which the passage can communicate with the interior of the container when mounted thereon. The interconnection means of the lid and the base are spaced inwardly of the respective perimeters thereof. By locating the interconnection means of the lid and base spaced inboard/inwardly of the respective perimeter thereof, no sink marks are created on the outer radial wall of the base. Further, the outer radial surface of the interconnection means of the lid and/or base are accessible, in addition to the inner radial surface. This allows more control over both the shape and method of moulding of the interconnection means. The interconnection means may be pivotal or maybe a flexible member (77, fig 5).

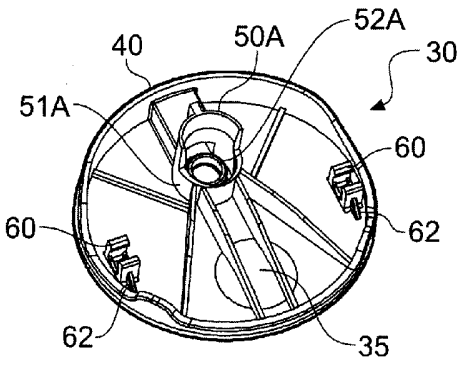

Fig. 3

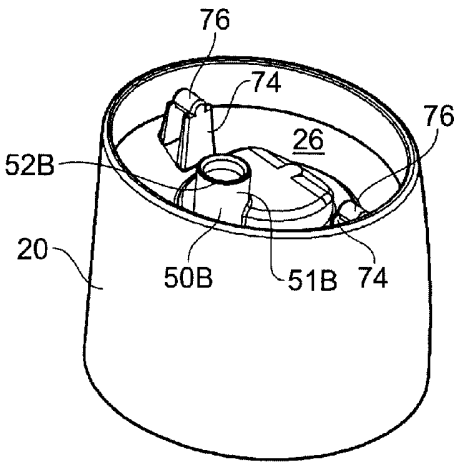

Fig. 4

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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

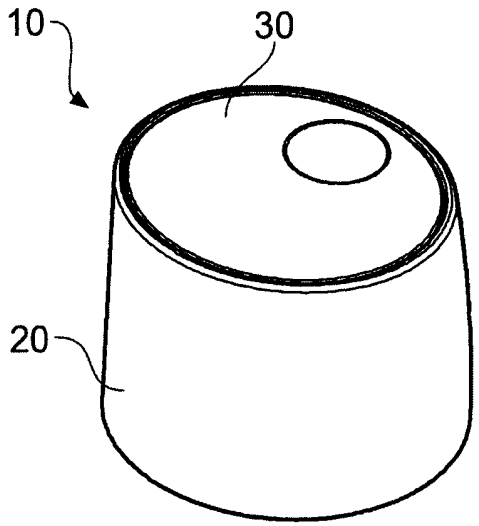

Fig. 1

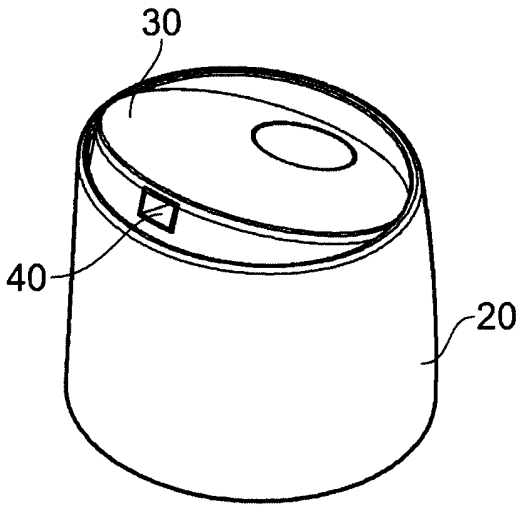

Fig. 2

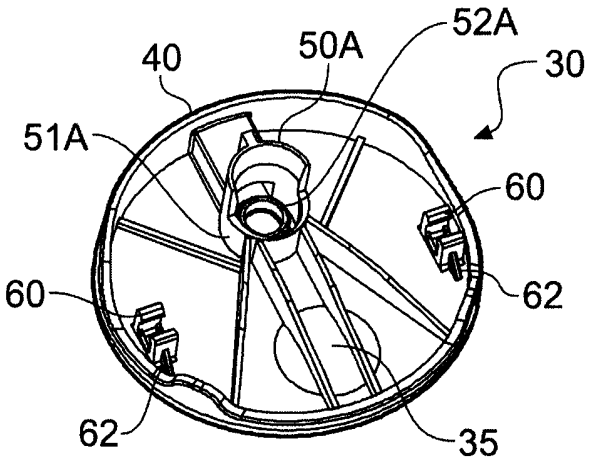

Fig. 3

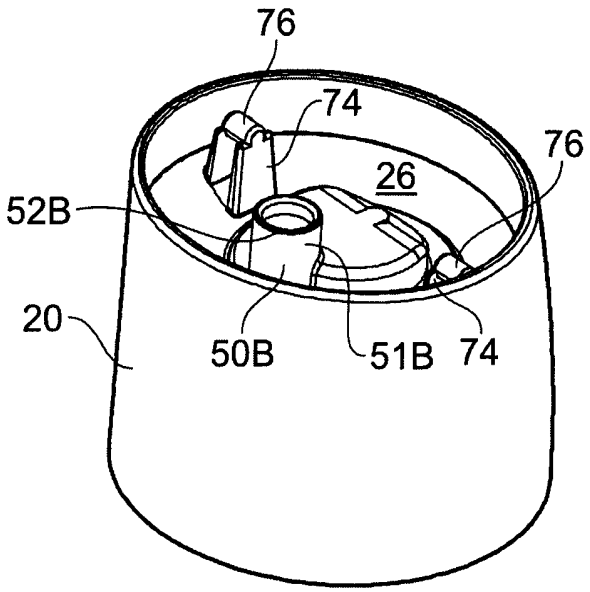

Fig. 4

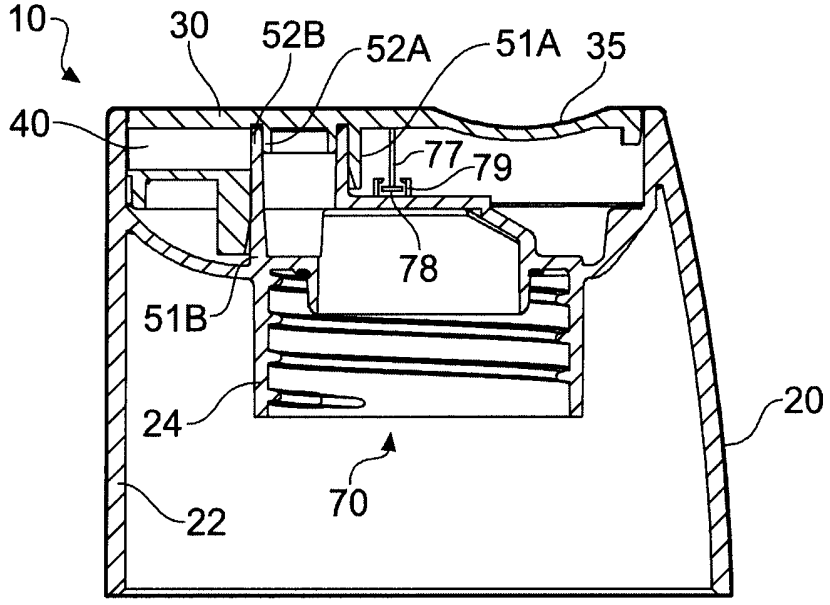
10
30
52B
52A
51A
35
40
77
79
78
51B
24
20
70
22

Fig. 5

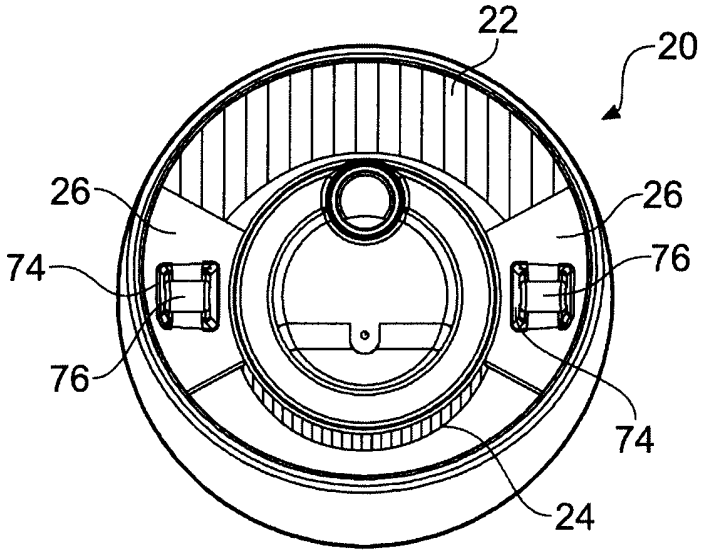
22
20
26
26
74
76
76
74
24

Fig. 6

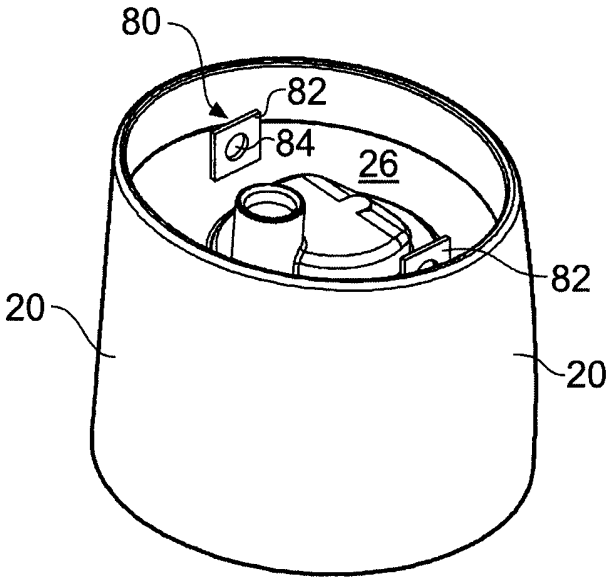

Fig. 7

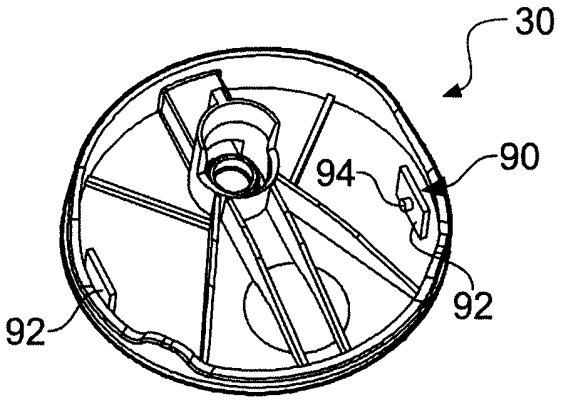

Fig. 8

A DISPENSING CLOSURE

This invention relates to a dispensing closure for a container and in particular to a dispensing closure which includes a closure cap and a dispensing spout which can rotate with respect to the cap between a closed position and an open position. Such container and closure combinations may contain and dispense products in the form of, for example, particulates, pastes, liquids, granules, or aerosols.

In known closures of this type, which are typically formed from injection moulded plastics, the spout is formed as part of a disc-like lid which is pivotably connected to the closure cap or base for rocking or tilting movement between open and closed positions. The means by which the base and lid are pivotably connected takes the form of a pair of pins and corresponding holes in which the pins may rotate. It is typical for the pins to be located on the perimeter (outer radial surface) of the lid and for the holes to be located on the inner radial surface of the outer perimeter wall of the base.

However, closures of this type suffer from several drawbacks as follows.

Although the holes do not pass all the way through the wall of the base, such that they are not visible on the outer radial surface, they do exist within the thickness of the wall so that the thickness is reduced at their location. This creates so-called sink marks on the outer radial surface of the base, as is well understood in this field.

Further, since the thickness of the wall is reduced at the location of the holes, the mechanical strength of the outer wall of the base is compromised.

Further still, since the two parts are typically formed separately and then assembled, the outer wall of the base has to be flexed outwardly so that the pins on the lid may be positioned in the holes. Although this is possible due to the slight resilience of the plastics material, the pins must be made such that they only just fit inside the holes, otherwise it would be difficult to assemble the two parts together without possible damage to one or both of the parts.

Also, it is important that the interference of the pins and holes with one another does not provide so much friction that it is difficult to rotate the lid with respect to the base. Accordingly, the tolerances necessary in the manufacture of the base and lid have to be carefully controlled and monitored.

It is desirable to have a dispensing closure of the type wherein a lid may move or rotate with respect to a base, with interconnection means and which addresses the above problems.

The present invention seeks to provide, therefore, a dispensing closure in which the interconnection of the lid and base is improved.

In one aspect, the invention provides a closure for a container having an open end, the closure comprising a base and a cooperating lid, the closure providing a

dispensing passage, wherein the lid and base are provided with interconnection means, such that the lid has limited rocking movement, with respect to the base, between a closed position in which the passage is isolated from the interior of the container and an open position in which the passage can communicate with the interior of the container when mounted thereon, wherein the interconnection means of the lid and/or base is spaced inwardly of the respective perimeter thereof.

By locating the interconnection means of the lid and/or base spaced inboard/inwardly of the respective perimeter thereof, no sink marks are created on the outer radial wall of the base. Further, the outer radial surface of the interconnection means of the lid and/or base are accessible, in addition to the inner radial surface. This allows more control over both the shape and method of moulding of the interconnection means.

In one embodiment, the interconnection means may be pivotal such that the lid and base may rotate, to some extent, with respect to one another.

It is possible for the pivotal interconnection means to comprise at least one gudgeon and one cooperating pin, one located on the base and the other on the lid.

For the purposes of this specification, the word "gudgeon" is defined as the female socket for receiving a hinged pin.

It is possible for the gudgeon to be constructed such that not only does it receive a cooperating pin but also that the pin snap fits into the gudgeon. This ensures that the two parts remain connected to one another in use.

When fitting the lid and base together, no flexing of the outer perimeter wall of the base will occur.

In another embodiment, the interconnection means may be a flexible member. This flexible member may be unitary with one or other, or both, of the lid and base. For instance, it is possible that the material used to form the lid is suitable to be flexible when moulded in a particular shape, such as a thin strip. Alternatively, the lid or base could be bi-injection moulded such that the flexible member is moulded with a different material from the lid or base. The material of the flexible member could be a thermoplastic elastomer.

Such a flexible member may also be bi-stable such that the lid may easily be flipped between a stable open position and a stable closed position.

The base of the closure may include a base wall adapted to lie over the open end of a container and an inner, cylindrical, skirt depending from the base wall and adapted to surround the open end of the container and cooperate therewith to secure the base to the container, wherein the base wall may be formed with an aperture which communicates with the passage of the closure when the lid is in the open position.

It is possible for the gudgeon to be located on either the lid or the base. Accordingly, the corresponding pin may be located on the respective other part. For instance, the gudgeon could be provided on one side of the lid and the corresponding pin located on the corresponding side of the base. The pin could be mounted on support walls such that the pin is raised off the surface of the base wall of the base.

In one embodiment, the base further has an outer, cylindrical, skirt coaxial with and surrounding the inner skirt. This outer cylindrical skirt may match with the contours of the body of the container so as to provide a smooth and uninterrupted surface of the container and closure combination.

It is also possible that the base wall between the inner and outer cylindrical skirts is discontinuous. This might be useful for light-weighting of the closure. The interconnection means would be associated with the continuous parts of the base wall.

The present invention and its advantages will be better understood by referring, by way of example, to the following detailed description and the attached Figures in which:

Figure 1 is a perspective view of a dispensing closure in a closed position;

Figure 2 is a perspective view of the closure of Figure 1 in an open position;

Figure 3 is a perspective view of the underside of a lid of one embodiment;

Figure 4 is a perspective view of the base of the embodiment of Figure 3;

Figure 5 is a cross-section of a closure of an alternative embodiment;

Figure 6 is a perspective view of another embodiment of a base;

Figure 7 is a perspective view of a base of a yet further embodiment; and

Figure 8 is a perspective view of the underside of a lid of the embodiment of Figure 7.

Referring to Figure 1, a dispensing closure generally indicated 10 is shown. The closure 10 comprises a base 20 and a lid 30. The lid 30 has a thumb or finger depression 35 marking where the lid should be pressed for opening. The base 30 has an outer, approximately cylindrical, skirt having an open end for receiving an associated container (not shown). The other end of the skirt is adapted for having the lid 30 fitted to it, as will be described in more detail below.

In Figure 2, the closure 10 is shown in an open position with the lid 30 having been tilted, rocked or rotated with respect to the base 20 such that a dispensing passage 40 has been exposed. This is achieved by the application of a force to one side of the lid 30, preferably at the depression 35. In combination with a corresponding container to which the closure has been fitted, product from within the container may be dispensed via the dispensing passage 40 when the lid 30 is in this open position. For instance, such a closure may be used in conjunction with containers which have flexible walls and contain cosmetic lotion so that in use the lid 30 is moved to the open position and the container walls are squeezed to dispense the lotion via the dispensing passage 40. Application of a force to the lid 30

approximately above the dispensing passage 40 will rock, or tilt, the lid 30 to the closed position shown in Figure 1.

A view of the underside of the lid 30 is provided by Figure 3. The term "underside" and other relational terms within this application are used with respect to the view of the dispensing closure in Figures 1 and 2 and in no way should be regarded as limiting on the claimed subject matter.

The lid 30 takes the form of a generally ellipsoidal disc, although it will be appreciated that other shapes are of course possible. A valve means 50A is provided which interact with valve means 50B (refer to Figure 4) provided on the base 20 to control the flow of product from the associated container via the dispensing passage 40.

The valve means 50A comprises a cylinder 51A which has a sealing part 52A lying within. The sealing part 52A takes the form of a cylinder closed at one end. The cylinder 51A has an opening at one point in its side which is in fluid connection with the dispensing passage 40.

Referring now to Figure 4, valve means 50B comprises an upstanding cylinder or spout 51B which is in fluid connection with the interior of an associated container (refer to Figure 5 for more detail). The spout 51B has an annular rim, or valve seat, 52B. With the lid 30 in the closed position, the sealing part 52A is sealingly pressed against the valve seat 52B, either on the rim or fitting inside the rim, such

that product from within the associated container cannot reach the dispensing passage 40.

With the lid 30 in the open position, the sealing part 52A is lifted off the valve seat 52B such that the dispensing passage 40 and the interior of an associated container form a continuous fluid pathway such that the contents of the associated container may be dispensed via the dispensing passage 40. However, the fluid is restricted, by an appropriate construction of the lid, such that it can only flow out of the spout 51B and into the dispensing passage 40 to avoid unwanted leakage of the product via the underside of the lid 30.

Means may also be provided, but not shown, which allow the lid to be maintained in both the open and closed positions, to avoid inadvertent opening or closing, but which allow a user to toggle the lid between the two positions without too much effort. Such means could take the form of an interference fit between parts on the lid and base. The means could provide a positive "click" to aid the user's identification of complete opening or closing of the closure.

In Figure 3, two gudgeons 60 are shown inwardly spaced from the perimeter of the lid 30. The degree of spacing inwardly from the perimeter may be chosen to suit the particular circumstances. One factor which may influence this spacing is to allow adequate room for the particular part or parts of the mould to fit between the gudgeon 60 and the perimeter of the lid 30. This may be particularly important where there is a lip or wall extending axially away from the underside of the lid 30

in the vicinity of the gudgeon 60. It is seen that the gudgeons 60 snap over corresponding pins 76 of the base 20. Further, the gudgeons are strengthened by means of gussets 62. These gussets 62 lie between the underside of the disc and the side wall of the gudgeon 60.

These corresponding hinge pins 76 may be seen in Figure 4. Each hinge pin 76 is raised off the surface of the base wall 26 by support walls 74 so that the hinge pins 76 are mounted across the top thereof. It is seen that the hinge pins 76 and their support walls 74 are also spaced inwardly from the perimeter of the base 20 and in particular at a distance from the radially inner surface of the outer cylindrical skirt. Accordingly, a gap is left between the outer radial surface of each support wall 74 and hinge pin 76 and the inner radial surface of the outer cylindrical skirt. This gap allows more freedom for fitting mould parts around the walls 74 and hinge pins 76 which increases the degree of complexity and strength of these components and improves de-moulding of the base 20 from the mould.

In use, the lid 30 is assembled with the base 20 such that on assembly each gudgeon 60 snaps over each hinge pin 76. This maintains the lid 30 and the base 20 in assembled cooperation with one another but also allows the lid to rotate, rock or tilt with respect to the base 20. This rocking motion enables the dispensing closure to be toggled between an open and closed position for the dispensing of product from an associated container.

In an alternative embodiment, shown in Figure 5, the interconnection means is a flexible member 77. In the embodiment shown this member is formed as part of the lid 30. However, it could equally be formed as part of the base 20 or be separate from both. At one end of the member 77 is a retaining block 78. This is retained within a snap-fit retaining socket 79 provided on the base 20. If the flexible member 77 is formed as part of the base 20 then this retaining socket 79 would be provided on the lid 30. Alternatively, a retaining socket 79 could be provided on both lid and base if the flexible member 77 is formed as a separate element. Other forms of connecting a flexible member between the lid and base are of course possible.

Such a flexible member 77 allows the lid 30 to move or rock relative to the base, in a similar manner to that of the gudgeon and hinge pin, so as to toggle between a closed and open position. Additional features, such as interference fits providing positive "clicks", described elsewhere in this application, may also be included with this embodiment.

The flexible member may be bistable such that the lid may easily be flipped between a stable open position and a stable closed position. Further, the flexible member 77 is spaced inwardly from the perimeters of both the lid 20 and base 30.

In Figure 5 means 70 for connecting the base 20 to an associated container are also seen. This takes the form of an inner, cylindrical, skirt 24 having threads lying on

its inner radial surface for interconnection with corresponding threads on the associated container (not shown).

Another embodiment is shown in Figure 6 where it is seen that the base wall 26 of the base 20 is discontinuous such that it only extends in two sectors. These two sectors coincide with the locations of the hinge pins 76 such that the hinge pins and their supporting walls 74 are mounted thereon. Where the base wall 26 is discontinuous it is possible to see the inner radial surface of the outer cylindrical skirt 22. It is also possible to see the outer radial surface of the inner, cylindrical, skirt 24.

A yet further alternative embodiment is seen in Figure 7. Here, rather than gudgeons and hinge pins, hinge assemblies 80 are provided by upstanding walls 82 through which holes 84 are provided. In Figure 8 the underside of a lid 30, which corresponds to the base 20 shown in Figure 7, is seen. Here, hinge pin assemblies 90 are provided by upstanding walls 92 which depend from the underside of the lid 30 and on which opposed pins 94 are provided on the inner radial surface. It will be readily apparent to those skilled in the art that the pins 94 fit inside holes 84 (refer to Figure 7) such that the lid 20 may rock, tilt or rotate with respect to the base 20. It is clear that both the walls 82 and pin assemblies 90 are spaced inwardly from the perimeters of the lid 30 and base 20.

Other types of pivotal interconnection means are of course possible.

CLAIMS

1. A closure for a container having an open end, the closure comprising a base and a cooperating lid, the closure providing a dispensing passage, wherein the lid and base are provided with interconnection means, such that the lid has limited rocking movement, with respect to the base, between a closed position in which the passage is isolated from the interior of the container and an open position in which the passage can communicate with the interior of the container when mounted thereon,

characterised in that the interconnection means of the lid and/or base is spaced inwardly of the respective perimeter thereof.

2. A dispensing closure according to claim 1, wherein the interconnection means is pivotal.

3. A dispensing closure according to claim 2, wherein the pivotal interconnection means comprises at least one gudgeon and one cooperating pin, one located on the base and the other located on the lid.

4. A dispensing closure according to claim 1, wherein the interconnection means is a flexible member.

5. A dispensing closure according to claim 4, wherein the flexible member is unitary with one or other, or both, of the lid and base.

6. A dispensing closure according to either of claims 4 and 5, wherein the flexible member is moulded from a thermoplastic elastomer.

7. A dispensing closure according to any preceding claim, wherein the base includes a base wall adapted to lie over the open end of the container and an inner, cylindrical, skirt depending from the base wall and adapted to surround the open end of the container and cooperate therewith to secure the base to the container, wherein the base wall is formed with an aperture which communicates with the passage of the closure when the lid is in the open position.

8. A dispensing closure according to claim 7, wherein the base further has an outer, cylindrical, skirt coaxial with and surrounding the inner skirt.

9. A dispensing closure according to claim 8, wherein the base wall between the inner and outer cylindrical skirts is discontinuous.

10. A dispensing closure substantially as herein before described with reference to, and as shown in, Figures 1 to 4.

11. A dispensing closure substantially as herein before described with reference to, and as shown in, Figure 5.

12. A dispensing closure substantially as herein before described with reference to, and as shown in, Figure 6.

13. A dispensing closure substantially as herein before described with reference to, and as shown in, Figures 7 and 8.

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Application No:	GB0601630.7	**Examiner:**	Mr Darren Williams
Claims searched:	1-13	**Date of search:**	22 March 2006

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1-9	US 4776501 A (OSTROWSKY) see whole document
X	1-7	EP 0658482 A1 (MUELLER) see whole document
X	1-7	WO 94/29184 A1 (PROCTOR & GAMBLE) see whole document
X	1-7	US 4441637 A (LIBIT) see whole document

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^{X} :

B8T

Worldwide search of patent documents classified in the following areas of the IPC

A47G; B65D

The following online and other databases have been used in the preparation of this search report

OPTICS, EPODOC, WPI