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(54) **A dispensing closure**

(57) A dispensing closure (10) is provided and comprises a base (20) having a dispensing orifice, and a lid (30) connected to the base by a hinge (35). The lid is

movable between a first, closed position and a second, open position. The closure also includes at least one cam (42) and at least one cam follower (50) for moving the lid from the first to the second position.

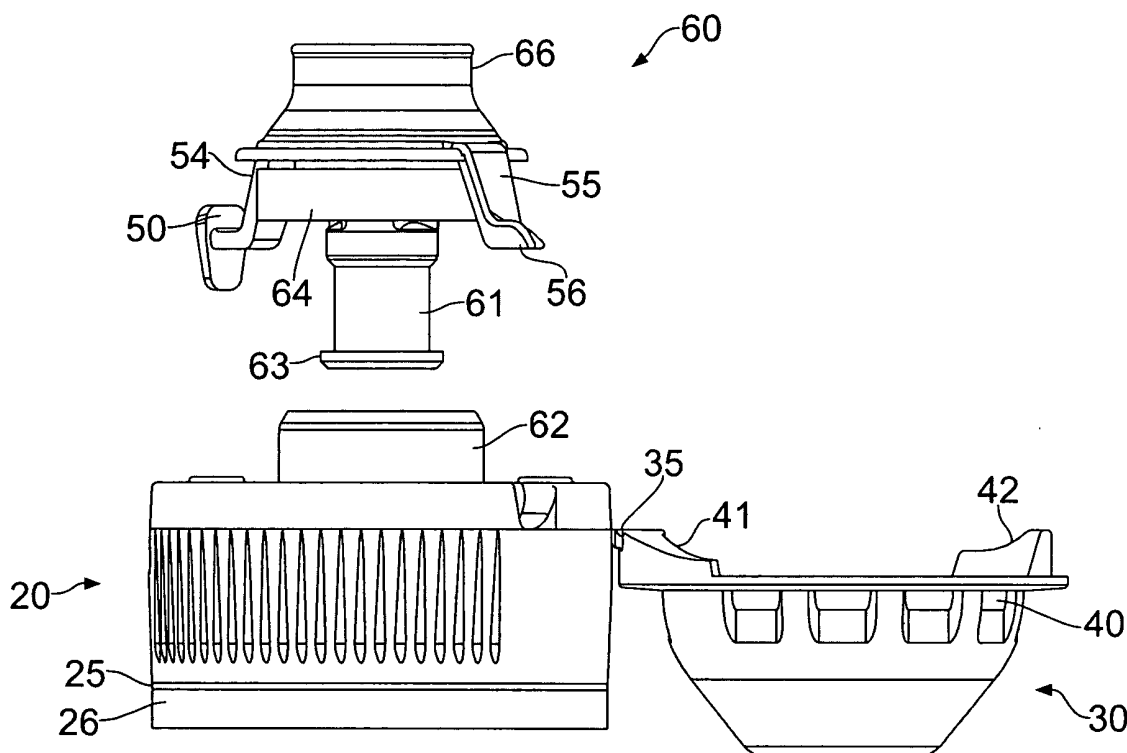


FIG. 4

Description

[0001] The present invention concerns a dispensing closure, having a body and a lid. The body defines a dispensing orifice through which the contents of a container, to which the closure may be attached in use, may be dispensed. The lid is attached to the body by a hinge which allows the lid to swing between a closed position, in which the lid occludes the dispensing orifice, to an open position, in which the dispensing orifice is exposed and the contents of the container, in use, may be dispensed. Means for assisting the opening of the lid are provided.

[0002] Closures comprising a base and a lid, whereby the lid is hinged to the base, are known. Typically, to open such a closure the lid is prised, or lifted, off the base to expose the dispensing orifice. However, the lid is sometimes so firmly removably attached to the base that this prising, or lifting, action is difficult to perform, especially by people with weak, or arthritic, fingers and hands.

[0003] Accordingly, there is a requirement for an improved dispensing closure whereby assistance may be provided to open the lid from the closed position.

[0004] Further, it is known for such dispensing closures to be provided with tamper evident features, such as for example a tamper evident band. These bands may be ripped, or pulled, off the closure so that the lid may be opened. The tamper band may then be thrown away. Alternatively, tamper evident bands in the form of a ring which remain in place on the container neck after the initial opening of the closure are known. However, it is sometimes difficult for a consumer to notice that a closure has already been opened and then resealed since the gap between the ring and the underside of the closure is sometimes extremely small such that at first sight it appears as though the ring has never been broken away from the lid.

[0005] Accordingly, an improved tamper evident feature for closures is required which makes it extremely obvious that a first opening event has occurred.

[0006] In one aspect, the invention provides a dispensing closure comprising a base having a dispensing orifice, and a lid connected to the base by a hinge, the lid being movable between a first position and a second position, wherein the closure also includes at least one cam and at least one cam follower, for moving the lid from the first to the second position.

[0007] The lid may seal the dispensing orifice such that it is air and water-tight or it may merely occlude the dispensing orifice.

[0008] In one embodiment, one of the at least one cam and cam follower may be provided on an actuator which is movable relative to the base and lid.

[0009] Moreover, it is possible that one of the at least one cam and cam follower is provided on the lid and the other of the at least one cam and cam follower is provided on the actuator. Additionally, or alternatively, one of the at least one cam and cam follower may be provided on

the base and the other of the at least one cam and cam follower may be provided on the actuator. The cams may take the form of ramps or screw threads.

[0010] It is possible that the actuator may project through, and in use be operable from outside, the lid when the lid is in the first position. In this context the word "project" includes the possibility that the actuator extends radially outside the lid. However, it also includes the possibility that the actuator does not extend radially beyond the lid but is still accessible via a recess or opening in the lid.

[0011] In another embodiment, the closure may include a spout movable relative to the base and lid. Further, the actuator may be connected to the spout, and in use, radial movement of the actuator, relative to a dispensing access of the closure, moves the spout in a direction axially away from the base. The movement of the spout may assist in moving the lid from the first position to the second position. In this embodiment, one of the at least one cam and cam follower is provided on the base and the other of the at least one cam and cam follower is provided on the spout. The cam may take the form of a ramp. Alternatively the cam may be in the form of a screw thread so that the spout not only moves axially away from the base, in use, but also rotates relative to the base.

[0012] In another embodiment, the closure may include a tamper evident feature. This tamper evident feature may be visible before the lid is first moved from the first position to the second position, and in use, may be hidden from view after the lid is first moved from the first position to the second position and then back to the first position. The feature may be retained by the closure.

[0013] The tamper evident feature may be a band frangibly connected to the spout. The connection may be in the form of frangible bridges. These frangible bridges may break when the lid is first moved from its said first position to its said second position. This may be achieved by preventing the band from moving axially away from the base with the spout.

[0014] In a yet further embodiment, the base may include a recess so that, in use, the band drops into the recess when the frangible bridges break. The band could be described as drop-band.

[0015] In another embodiment, the lid may include openings through which the tamper evident feature may be visible before the lid is first moved from the first position to the second position. The absence of the band may be apparent through the openings when the lid has been returned to the first position after having been moved to the second position. This is by virtue of the fact that the band may have dropped into the recess.

[0016] In another aspect, the invention provides a closure having any combination of the features described above in combination with a container.

[0017] In a further aspect, the invention provides a dispensing closure having tamper evident means, the means being visible before the closure is first opened,

and being hidden from view after the closure is first opened and then re-closed. The tamper evident means may be retained by the closure.

[0018] The closure may include a base and a lid hinged to the base. The invention also contemplates such a closure in combination with a container.

[0019] 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 one embodiment of the closure with the lid in the closed position;

Figure 2 is a view of the closure of Figure 1 with the lid partially open;

Figure 3 is a view of the closure of Figures 1 and 2 with the lid in the fully open position;

Figure 4 is an exploded side view of the closure;

Figure 5 is a side view of the closure with the lid in the fully open position;

Figure 6 is a cross-sectional view of the closure with the lid in the open position and with the frangible bridges unbroken;

Figure 7 is a cross-sectional view of the closure of Figure 5 with the frangible bridges broken;

Figure 8 is a perspective view of the closure with the lid in the closed position viewed from the front;

Figure 9 is a perspective view of the closure with the lid in the closed position viewed from behind;

Figure 10 is a side view of the closure with the lid in the closed position viewed from the front;

Figure 11 is a perspective view of the closure with the lid in the partially open position viewed from the side;

Figure 12 is a view of the closure of Figure 11 with the lid in the fully open position;

Figure 13 is a perspective view of the closure with the lid in a partially open configuration viewed from the front;

Figure 14 is a view of the closure with the lid in the partially open configuration viewed from one side;

Figure 15 is a view of the closure of Figure 14 viewed from the other side;

Figure 16 is a perspective view of the closure with the lid in the fully open position viewed from the front;

Figure 17 is a view of the closure with the lid in the fully open position viewed from one side;

Figure 18 is a perspective view of the closure with the lid in the fully open position viewed from behind;

Figure 19 is a close-up perspective view of the closure with the lid in the partially open position viewed from the front; and

Figure 20 is a close-up perspective view of the hinge area of the closure with the lid in the partially open position.

[0020] Figure 1 is a so-called "solid-body drawing". It is a perspective view of one embodiment of the closure

comprising a base part 20 and a lid part 30. Windows 40 are provided in the lid part 30. Further discussion regarding these windows 40 is given below. In the base part 20 a recess 52 is provided and within this recess an actuator 50 is provided. This actuator 50 may move within the recess 52 from the position in which it is shown in Figure 1 at the left hand end of the recess 52 to the opposite end of the recess 52 such that it is at the right hand end (as shown in Figure 3). An explanation of how this is achieved and the effect it has on the closure will be given below.

[0021] Also in Figure 1 is an imaginary dispensing access 5 shown to extend through the centre of the closure 10. If the closure 10 were applied to a container (not shown) then the dispensing access 5 would extend through the orifice of the container.

[0022] Furthermore, although within this application the words "upper", "lower", and other such relative terms are used, it should be understood that they relate to the closure as shown in Figure 1 in that the base part 20 is beneath the lid part 30. In other words, these terms relate to how a closure would typically be fitted to a container, such as a bottle, with this container standing upright with the closure at the top and the dispensing axis 5 being vertical. These relative terms should not be regarded as limiting in any way to the scope of the invention.

[0023] Figure 2 is a perspective view of the closure 10 of Figure 1 with the lid part 30 partially open. Underneath the lid part 30, the spout part 60 may be seen. This spout part 60 is connected to the actuator 50 by an actuator front arm 54. Movement of the actuator 50 from the left hand end of the recess 52 towards the right hand end of the recess moves the spout part 60 axially away from the base part 20. This is achieved because on the base part 20 a front-side base cam 70 is provided. This front-side base cam 70 takes the form of a ramp having its lowest end (the end nearest to the underside of the base 20) at the left hand end of the recess 52, and its highest end (the end furthest away from the underside of the base 20) at the right hand end of the recess 52. As the actuator 50 is moved to the right hand end of the recess 52 the actuator front arm 54 rides along and up the ramp 70. Since the front actuator arm 54 is connected to the spout part 60, the spout part 60 is lifted or raised axially away from the base part 20. Further, a front-side lid cam 42 is provided on the underside of the lid 40 above the recess 52 (when the lid is in the closed position). Accordingly, as the actuator 50 is moved within the recess 52 the actuator front arm 54 will push against the front-side lid cam 42 (which takes the form of a ramp having its lowest end on the right hand side of the recess). Accordingly, as the actuator front arm 54 moves axially upwards and away from the base part 20 the lid part 30 is also moved axially upwards by means of the interaction of the actuator front arm 54 and the ramp 42.

[0024] A perspective view of the closure 10 with the lid in the fully open position is shown in Figure 3. The actuator 50 has been moved fully to the right hand end of the

recess 52. The spout 60 has accordingly been moved axially upwards to its maximum height above the base part 20. Also visible in this Figure is the top of the tamper band 64. Further discussion regarding this tamper band 64 will be given below.

[0025] An explanation of how the spout part 60 fits to the base part 20 will now be provided with reference to Figure 4. On the underside of the spout part 60 is a lower spigot 61. This lower spigot 61 is hollow and provides a communication for the fluid contained in an associated container (not shown) through the closure 10 and out of the spout part 60 via the chimney 66. More details of how fluid is dispensed is given below. When the spout part 60 is pushed down into the base part 20, during assembly, an interlock is provided between the socket 62 and the lower spigot 61. This is achieved by means of an annular projection 63 provided at the lower end of the lower spigot 61.

[0026] An actuator front arm 54 and an actuator rear arm 55 are connected to the spout part 60. These front and rear actuator arms are, in this embodiment, diametrically opposite one another such that the rear arm 55 is adjacent the hinge 35. At the end of the actuator rear arm 55 a rear cam follower 56 is provided. This rear cam follower 56 interacts with the hinge side, or rear-side, lid cam 41. The front actuator arm 54 interacts with the front-side lid cam 42, as discussed above. More details of how these cams and cam followers operate is given below.

[0027] A tamper band 64 is included as part of the spout part 60. It takes the form of an annular ring. This ring is suspended from the underside of the upper portion of the spout part 60 by frangible bridges 65 (refer to Figure 6). The tamper band 64 lies radially within the actuator front arm 54 and actuator rear arm 55, and above the lower spigot 61 such that when the spout part 60 is fitted to the base part 20, during assembly, the tamper band 64 lies radially outward of the socket 62 provided on the upper side of the base part 20. More details regarding the tamper band 64 are given below.

[0028] Another tamper evident feature is provided at the lower end of the base part 20 in the form of an additional tamper evident band 26, connected to the underside of the base part 20 by frangible bridges 25. This tamper evident feature provides evidence of the closure having been removed from the neck of a container in the well understood manner.

[0029] When the lid part 30 is in the closed position the tamper band 64 is visible through the windows 40. The visibility of the band 64 is enhanced if the band 64 and spout part 60 are made from a different colour from that of the base 20 and lid 30 parts.

[0030] Figure 5 shows how the spout part 60 fits into the base part 20. This Figure does not accurately represent how the closure would be seen in use since the lid part 30 is shown in the open position and yet the tamper band 64 is still visible. In normal use, opening of the lid part 30 would cause the tamper band 64 to be hidden from view. More details of how this occurs are given be-

low.

[0031] Figure 6 is a cross-sectional view through the closure with the lid part 30 in the open position. Again, this view is not representative since the tamper band 64 is shown still connected to the underside of the spout part 60 by frangible bridges 65. In use, these bridges would have broken once the lid part 30 had been opened. Furthermore the actuator 50, cams 41, 42, 70, 72 and cam follower 56 are not shown for the sake of clarity. Nonetheless, this Figure will aid an understanding of how the closure 10 is constructed.

[0032] The base part 20 has threads 21 by which it may be attached to a container (not shown). Instead of threads 21, snap beads or other well known means of attachment may be employed.

[0033] A sealing part 31 is provided on the underside of the lid part 30 so that with the lid in the closed position it presses against the spout orifice 32 to seal the spout orifice 32. However, other means for sealing the closure are also provided as will be discussed below.

[0034] On the underside and within the base part 20 a bore seal 22 is provided. This bore seal fits tightly against the orifice of the container (not shown) to provide a good seal therebetween. The lid part 30 is hinged to the base part 20 by hinge 35. The hinge 35 may be a film hinge, or a snap hinge. However, it is preferable that it is constructed to allow the lid part 30 to be rotated away from the base part 20 by at least 180° so that the lid part 30 does not obstruct a user's mouth from being placed around the chimney 66 in use. In one embodiment, the hinge 30 may resiliently bias the lid part 30 to the open position.

[0035] At the upper end of the base part 20 a base orifice 69 is provided by means of an annular wall. Above this base orifice 69 a socket 62 is provided by means of another annular wall projecting upwardly. Radially outward of the socket 62 is a recess 68. This recess 68 is an annulus and has a radially outer wall 74. At the upper end of this outer wall 74 a bead, or projection, 75 is provided on the inner radial surface.

[0036] The spout portion 60 comprises a chimney 66 which in use a consumer may place his lips around. At the lower end of the chimney 66 an upper spigot 67 is provided. This upper spigot 67 is connected to the lower spigot 61. The upper spigot 67 fits radially inside the socket 62. A seal between the upper spigot 67 and the socket 62 may be provided additionally or may be due to an interference fit between the two parts.

[0037] The lower spigot 61 fits radially inside the base orifice 69. A seal between the lower spigot 61 and the base orifice 69 may be provided additionally or may be due to an interference fit between the two parts. At the lowest end of the lower spigot 61 a projection 63 is provided. This projection 63 is on the outer radial surface of the lower spigot 61. The purpose of this projection 63 is to limit the axial movement of the spout part 60 relative to the base part 20 as is more clearly shown in Figure 7.

[0038] Apertures 80 are provided in the radial walls of

the lower spigot 61. With the spout 60 in the closed, or lowered, position these apertures are sealed against the inner radial wall of the base orifice 69. Furthermore, the top of the lower spigot 61 is sealed by an end wall 84. Accordingly, with the lower spigot 61 in the lower position fluid cannot be dispensed from an associated container. Apertures 82 are also provided in the upper spigot 67. More details of these are provided below.

[0039] A flared portion 77 is also provided on the radially outer face of the chimney 66. Attached to this flared portion 77 is a tamper band 64. This is attached by means of frangible bridges 65. At the lower end of the tamper band 64 a projection 76 is provided. This projection 76 lies on the radially outer face of the tamper band 64. This projection 76 interacts with the projection 75 provided at the upper end of the radially outer wall 74 of recess 68, described above. During assembly of the closure 10 the spout part 60 is introduced to the base part 20 by pushing the lower spigot 61 into the base orifice 69. Simultaneously, the upper spigot 67 is pushed into the socket 62, and the tamper band 64 is introduced into the upper end of the recess 68 such that the projections 76 and 74 pass one another so that the projection 76 at the lower end of the tamper band 64 is lower than the projection 75 at the upper end of the wall 74.

[0040] The projections 76 and 75 are designed so that they allow the spout part 60 to be introduced from above into the base part 20 but do not allow the spout part 60 to be moved axially upwards away from the base part 20 without the frangible bridges 65 breaking. Accordingly, as the spout part 60 is raised axially relative to the base part 20 the frangible bridges 65 break and the tamper band 64 falls into the recess 68. With the lid part 30 in the closed position, the windows 40 are axially aligned with the tamper band 64 (before the tamper band falls into the recess) such that the tamper band may be visible through the windows 40. However, once the lid part 30 has been opened, the frangible bridges 65 break, the tamper band 64 falls into the recess 68 and accordingly if the lid is re-closed the tamper band is not visible through the windows 40 since the tamper band 64 lies within the recess 68.

[0041] The projection 63 at the base of the lower spigot 61 is also designed such that the spout part 60 may be introduced to the base part 20 from above but will not allow the spout part 60 to be removed from the base part 20.

[0042] Although the means by which the tamper band 64 is prevented from travelling with the spout part 60 axially away and upwards relative to the base part 20 has been described as corresponding projections 75, 76, other means are of course possible. For instance, instead of two corresponding projections, one could be replaced by an undercut in either the band 64 or the wall 74.

[0043] Furthermore, the recess 68 and tamper band 64 could be discontinuous annuli.

[0044] Figure 7 shows a situation where the spout part 60 has been raised axially relative to the base part 20

and the frangible bridges 65 have broken such that the tamper band 64 now lies within the annular recess 68. It will be observed that the apertures 80 in the walls of the lower spigot 61 are now above and away from the walls of the base orifice 69 such that they are no longer sealed. Accordingly, with the spout part 60 in the raised position fluid may flow from the container (not shown) through the lower spigot 61, the apertures 80, the apertures 84 and the chimney 66. Returning the spout part 60 to the lower position, as shown in Figure 6, will reseal the container such that fluid may no longer be dispensed.

[0045] In Figure 8 a perspective view of the closure 10 from the front (i.e. from the side diametrically opposite the hinge 35) is shown. The front-side lid cam 42 may be seen within the recess 52. The actuator 50 is also present in the recess 52. As the actuator 50 is moved to the right hand end of the recess 52 it acts as a cam follower and pushes against the front-side lid cam 42 thus raising the lid part 30.

[0046] In Figure 9, a perspective view of the closure 10 from the rear (i.e. from the hinge 35) is shown. The hinge-side, or rear-side, lid cam 41 may be seen together with the rear cam follower 56 which is connected to the actuator rear arm 55 (not shown). As the actuator 50 is moved to the right hand end of the recess 52, the rear cam 56 also moves towards the right hand side (towards the hinge 35 in Figure 9) and interacts with the hinge-side lid cam (which takes the form of a ramp) thus helping to push the lid part 30 to the open position.

[0047] Figure 10 shows a side view of the closure 10 with the lid part 30 in the closed position from the front. The windows 40 may be seen in the lid part 30.

[0048] In Figure 11 a perspective view of the closure 10 with the lid part 30 partially open is shown. The recess 68 is visible together with the upper spigot 67. In this Figure, the tamper band 64 is not shown for the sake of clarity. However, the actuator 50 together with the actuator arms 54, 55 and rear cam follower 56 are clearly shown. It may be seen how the rear cam follower 56 has pushed against the hinge-side lid cam 41 such that the lid part 30 has been pushed open. Further, it may also be seen how the actuator 50, acting as a cam follower, has pushed against the front-side lid cam 42 to push the lid part 30 open. Additionally, it is possible that the spout part 60 also pushes against the underside of the lid part 30, as it is raised axially upwards away from the base part 20, to assist in opening the lid part 30.

[0049] Figure 12 shows the closure of Figure 11 with the lid part 30 in the fully open position. However, in Figure 12 the actuator 50 has been moved to the far right hand end of the recess 52. Accordingly, and due to the operation of the cams and cam followers, the spout part 60 has been raised further, axially upwards away from the base part 20.

[0050] A view of the closure with the lid part 30 in the partially open position is shown in Figure 13 from the front side (i.e. diametrically opposite the hinge 35). The actuator 50, acting as a cam follower, is shown to have

travelled partially along the ramp 70 such that the spout part 60 has lifted up axially away from the base part 20.

[0051] A side view of the closure of Figure 13 is shown in Figure 14. This more clearly shows the hinge-side lid cam 41 and the front-side lid cam 42. The socket 62 together with the upper spigot 67 are also visible. These are cooperating cylinders with the socket 62 being radially outward of the upper spigot 67. The upper spigot 67 is connected to the spout part 60 whereas the socket 62 is connected to the base part 20.

[0052] Figure 15 shows a side view of the closure of Figure 14 from the other side and more clearly shows the rear cam follower 56 interacting with the hinge-side lid cam 41.

[0053] Figure 16 shows a perspective view of the closure from the front side with the lid part 30 in the fully open position. The actuator 50 has been moved to the right hand end of the recess 50 such that it has travelled along and up the ramp of the front-side base cam 70. Accordingly, the spout portion 60 has risen upwards axially away from the base part 20. Due to the interaction of the projections 75 and 76, discussed above, the tamper band 64 has been disconnected from the underside of the spout portion 60 by means of the frangible bridges 65 breaking, and has dropped into the recess 68. The top of the tamper band 64 is visible within the recess 68. This provides a degree of certainty to a consumer that the closure has already been opened, rather than that the tamper band was never present in the first place, as will be discussed further below.

[0054] Figure 17 is a side view of the closure of Figure 16 with the lid part 30 in the fully open position.

[0055] Figure 18 shows a rear view of Figure 17 with the lid part 30 in the fully open position. The recess 53 for the rear actuator arm 55 is clearly shown. At the end of the rear actuator arm 55 a rear cam follower 56 is provided. This rear cam follower 56 travels along and axially up the ramp of the hinge-side (or rear-side) base cam as the actuator 50 is rotated axially relative to the base part 20 and lid part 30. As the rear cam follower 56 travels along the hinge-side base cam 72 not only does their interaction lift the spout part 60, but also the rear cam follower 56 pushes against the hinge-side (or rear-side) lid cam 41. Accordingly, the lid part 30 is pushed open by the rotational movement of the rear cam follower 56. Additionally, or alternatively, the spout part 60 may also push against the underside of the lid part 32 to assist in opening the lid part 30.

[0056] Figure 19 shows a close-up view of the front of the closure 10 and in particular the shows the actuator 50 having moved along the front-side base cam 70 within the recess 52.

[0057] Figure 20 shows a close-up view of the rear actuator arm 55 and rear cam follower 56 interacting with the hinge-side lid cam 41 within the recess 53. Further, it may be seen how the rear cam follower 56 travels along and up the hinge-side base cam 72. The hinge 35 is also visible.

[0058] This closure has been described to explain how corresponding cams and cam followers may raise the lid part 30 by movement of an actuator 50. However, it is clear that other possible means of lifting the lid part 30 away from the base part 20 are possible. For instance, rather than having cams on the base part 20 and the lid part 30, corresponding screw threads could be provided on the lower spigot 61 and socket 62. For instance, (refer to Figure 6) if a screw thread is provided on the radially outer surface of the lower spigot 61 and a corresponding screw thread is provided on the radially inner surface of the base orifice 69, such that the two threads were associated with one another, and the spout part 60 was rotated relative to the base part 20, the spout part 60 would travel axially upwards away from the base part 20. These screw threads could be employed instead of, or as well as, the cooperating cams and cam followers described above. Furthermore, instead of the screw threads being provided on the lower spigot 61 and base orifice 69, they could be provided on the external radial surface of the upper spigot 67 and the internal radial surface of the socket 62.

[0059] The invention also contemplates an embodiment where the actuator 50 is not connected to the spout part 60, but rather is a separate element. In this form it could be retained in the closure by an annulus which fits around the socket 62. It could still be provided with cam followers so that its rotational movement, relative to the base part 20, caused it to ride up the ramps or cams and thus push the lid part 30 open.

[0060] Furthermore, it is conceivable that rather than the cam followers being provided on the actuator 50 and the cams being provided on the base 20 and lid 30 parts, the cams are instead provided on the actuator 50 and the cam followers are provided on the base and lid parts.

[0061] In use, a user would purchase a container including a closure 10, as described herein. The consumer would be able to observe the tamper band 64 through the windows 40. This may be enhanced by the tamper band being a different colour from the lid part 30 and base part 20. To open the closure the consumer would move the actuator 50 within the recess 52, possibly with his thumb. This would lift the lid part 30 away from the base part 20, due to the mechanism described above. The frangible bridges 65 would then break such that the tamper band 64 would drop into the recess 68. With the lid part 30 rotated away from the base part 20 the consumer could dispense the contents of the container via the spout orifice 32. When the consumer wished to close the lid part 30, he would merely flip it back with his fingers. By moving the lid part 30 back to the fully closed position, the actuator 50 would be moved back to its original position at the left hand end of the recess 52. Alternatively, it is conceivable that the actuator 50 may be biased towards this position such that as soon as the consumer released it from the right hand end of the recess 52 it moved back to the left hand end of the recess 52. With the lid part 30 returned to the fully closed position, the

tamper band 64 would no longer be visible through the windows 40. Accordingly, a consumer would be able to tell whether the closure has already been opened before purchase.

[0062] If a consumer picked up a container with a closure 10 as described herein and the tamper band 64 was not visible through the windows 40 then he may not be certain whether or not it has been opened since it is possible that the closure could have a tamper band 64 of the same colour as the base part 20 and lid part 30, or alternatively, the closure 10 could be defective. However, due to the construction of this closure a consumer could easily check whether the closure had had a tamper band 64 in the past, but it had dropped out of sight into the recess 68, by means of turning the container and closure upside down. If the tamper band 64 reappeared in the windows 40, by virtue of gravity pulling it out of the recess 68, then the consumer would know that the closure was of the type which had tamper evident features and that the closure had been already opened.

Claims

1. A dispensing closure comprising a base having a dispensing orifice, and a lid connected to the base by a hinge, the lid being movable between a first position and a second position, wherein the closure also includes at least one cam and at least one cam follower, for moving the lid from the first to the second position.
2. A closure according to Claim 1, wherein one of the at least said one cam and cam follower is provided on an actuator which is movable relative to the base and lid.
3. A closure according to Claim 2, wherein one of the at least said one cam and cam follower is provided on the lid and the other of the at least said one cam and cam follower is provided on the actuator.
4. A closure according to Claim 2, wherein one of the at least said one cam and cam follower is provided on the base and the other of the at least said one cam and cam follower is provided on the actuator.
5. A closure according to any one of Claims 2 to 4, wherein the cam is in the form of a ramp.
6. A closure according to any one of Claims 2 to 5, wherein the actuator projects through, and in use is operable from outside, the lid when the lid is in the first position.
7. A closure according to any preceding claim, including a spout movable relative to the base and lid.
8. A closure according to Claim 7, wherein the actuator is connected to the spout, and in use, radial movement of the actuator, relative to a dispensing axis of the closure, moves the spout in a direction axially away from the base.
9. A closure according to Claim 8, wherein the movement of the spout assists in moving the lid from the first position to the second position.
10. A closure according to any one of Claims 7 to 9, wherein one of the at least one said cam and cam follower is provided on the base and the other of the at least said one cam and cam follower is provided on the spout.
11. A closure according to any one of Claims 3, 4 and 10, wherein the cam is in the form of a screw thread.
12. A closure according to any preceding Claim including a tamper evident feature.
13. A closure according to Claim 12, wherein the tamper evident feature is visible before the lid is first moved from the first position to the second position, and which in use, is hidden from view after the lid is first moved from the first position to the second position and then returned to the first position, the means being retained by the closure.
14. A closure according to either one of Claims 12 and 13, when dependent on any one of Claims 7 to 11, wherein the tamper evident feature is a band frangibly connected to the spout.
15. A closure according to Claim 14, wherein the base includes a recess and, in use, the band drops into the recess when it is released from the spout during opening.
16. A closure according to any one of Claims 12 to 15, wherein the lid includes openings through which the tamper evident feature is visible before the lid is first moved from the first position to the second position and through which the absence of the band is apparent when the lid has been returned to the first position after having been moved to the second position.
17. A closure according to any preceding claim in combination with a container.

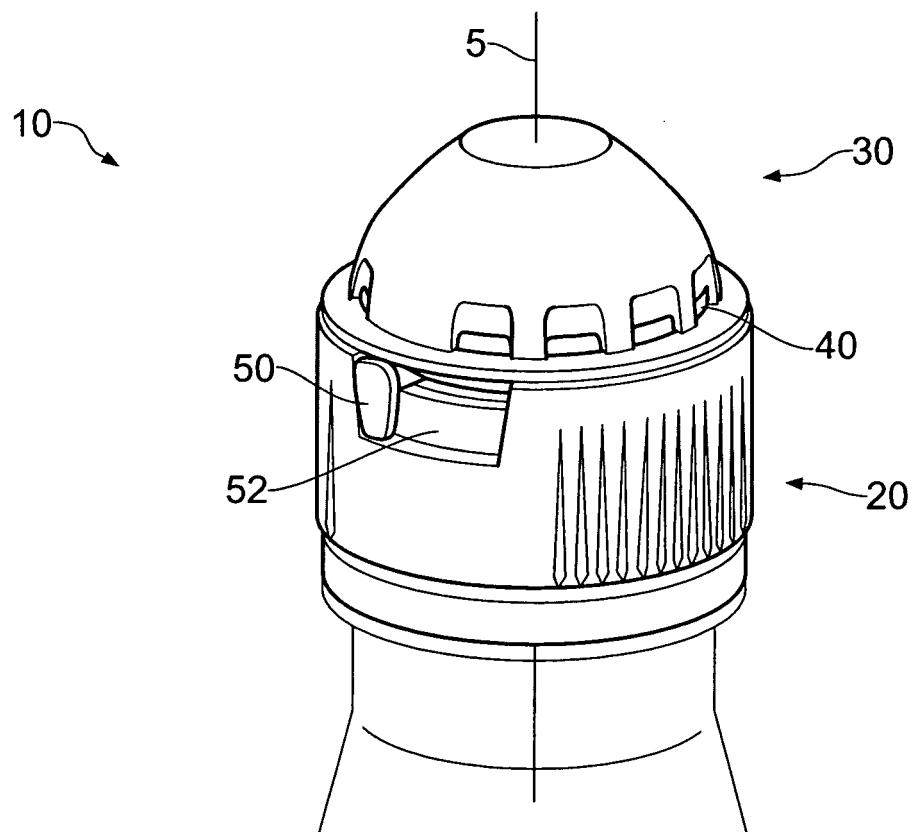


FIG. 1

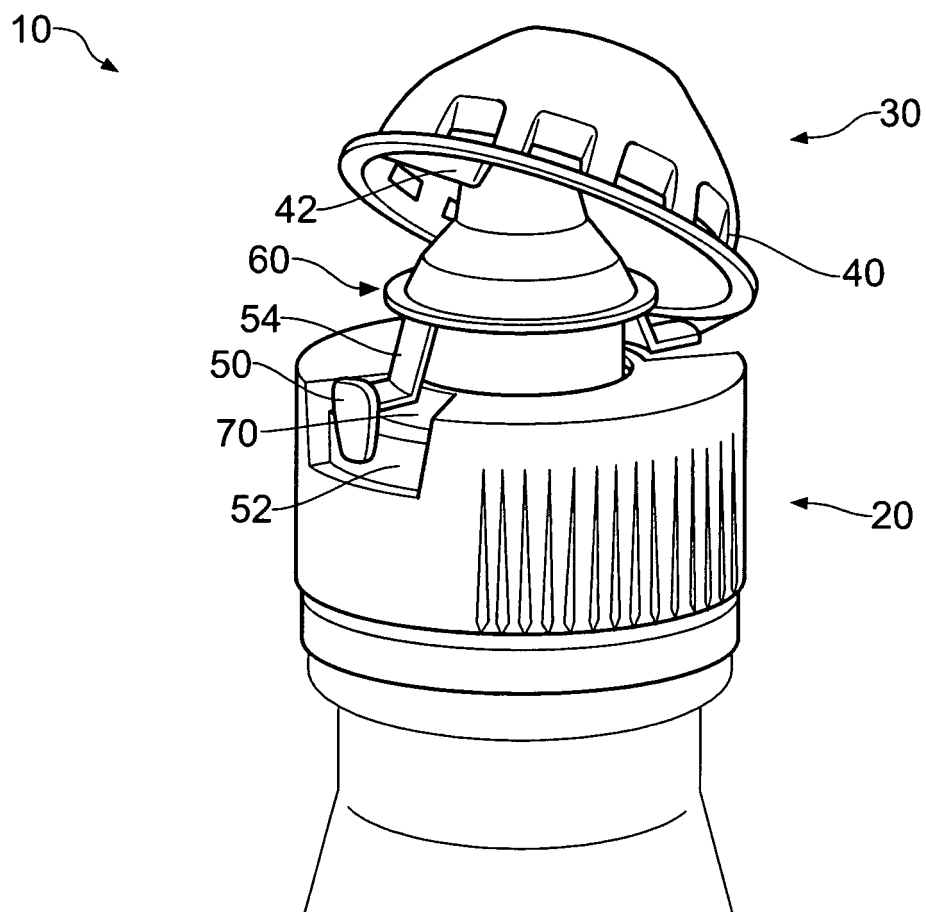


FIG. 2

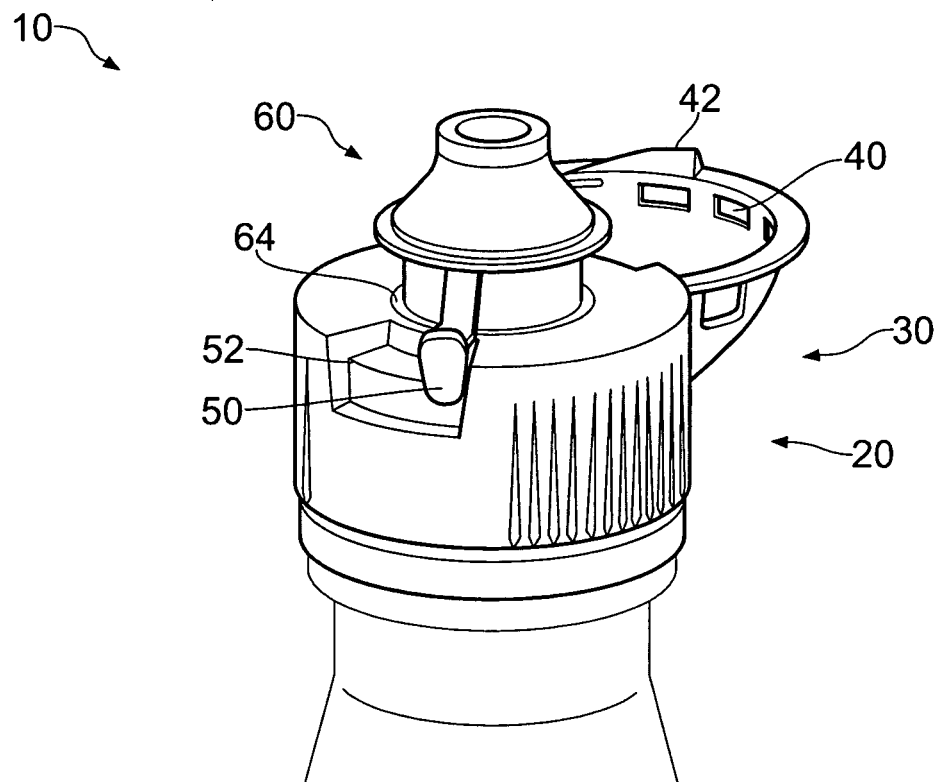


FIG. 3

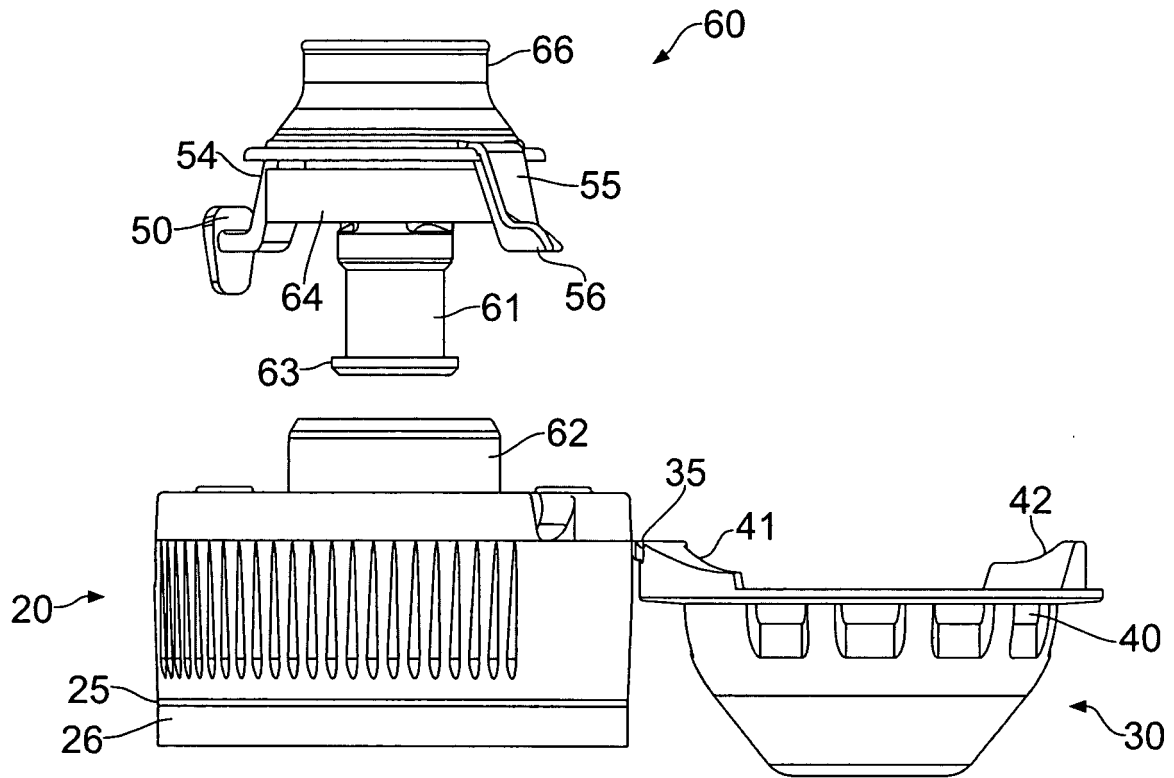


FIG. 4

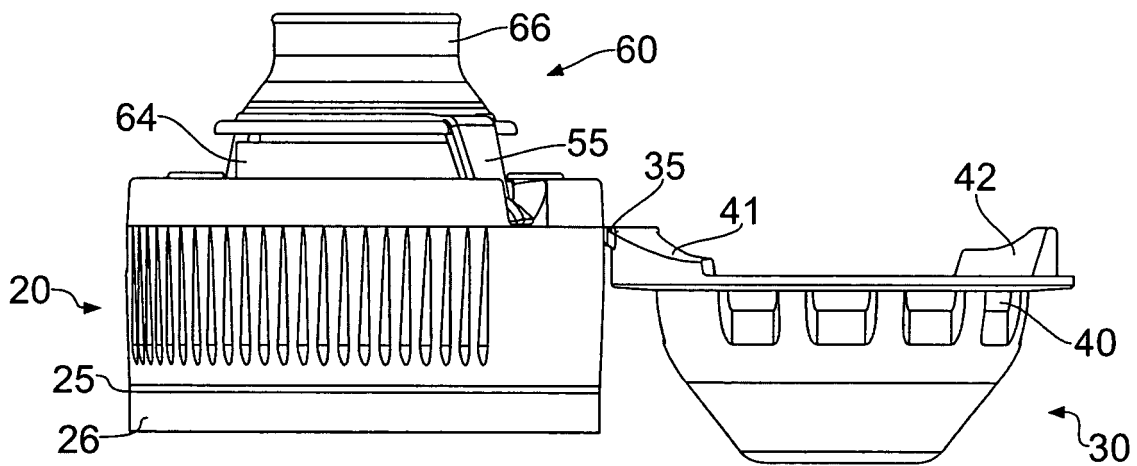


FIG. 5

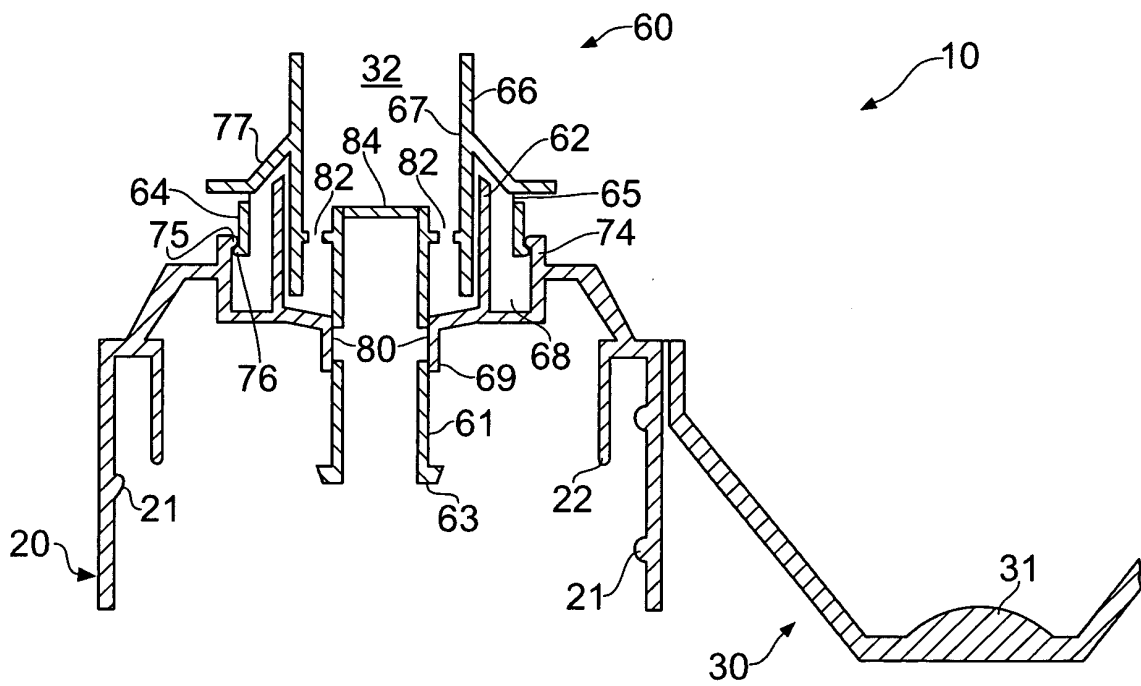


FIG. 6

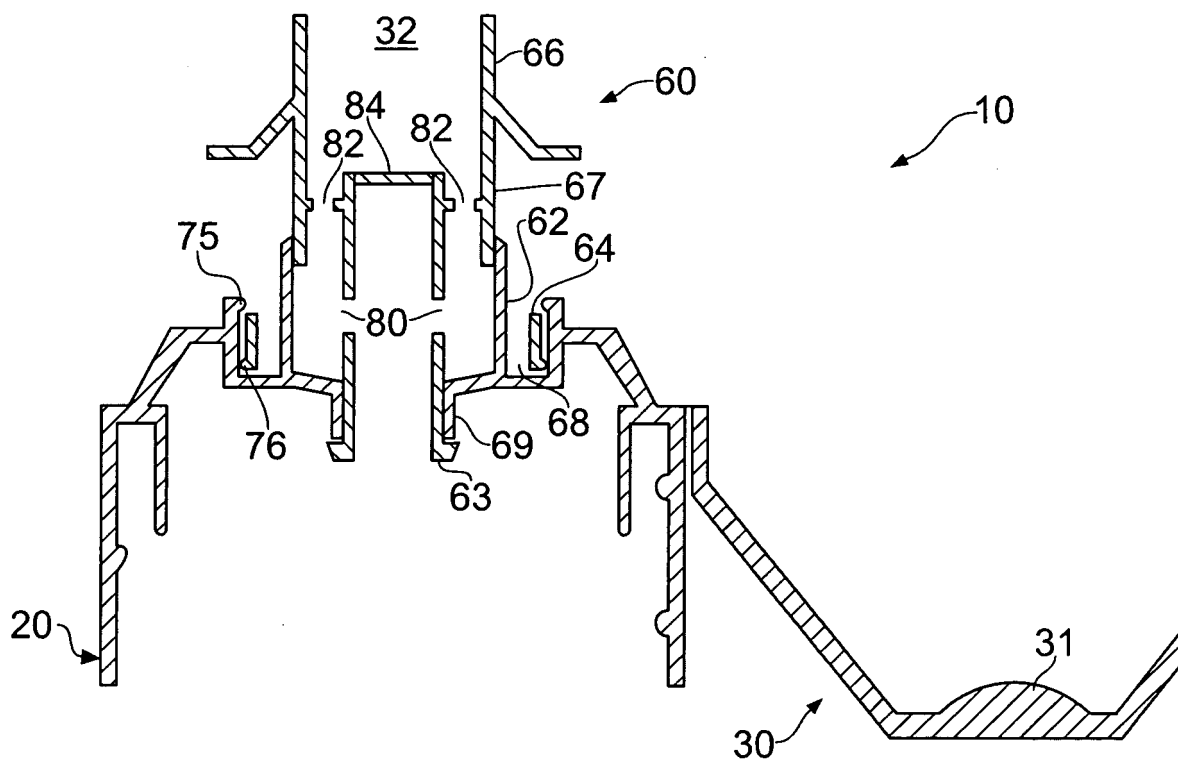


FIG. 7

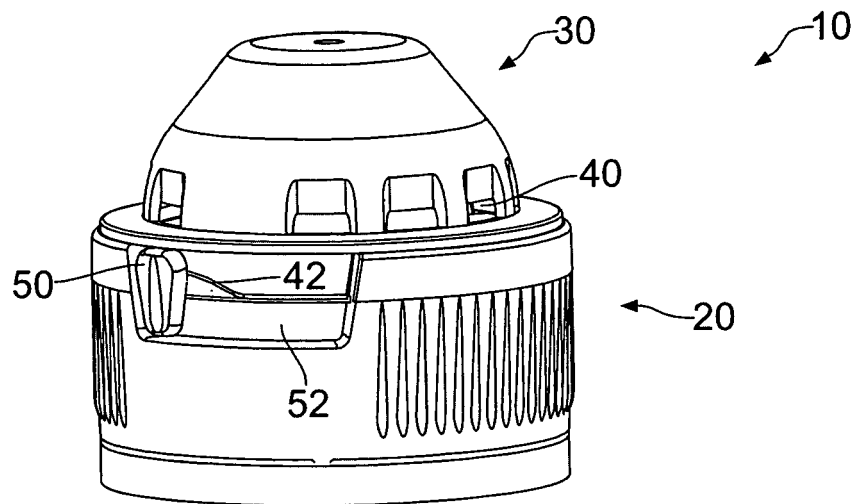


FIG. 8

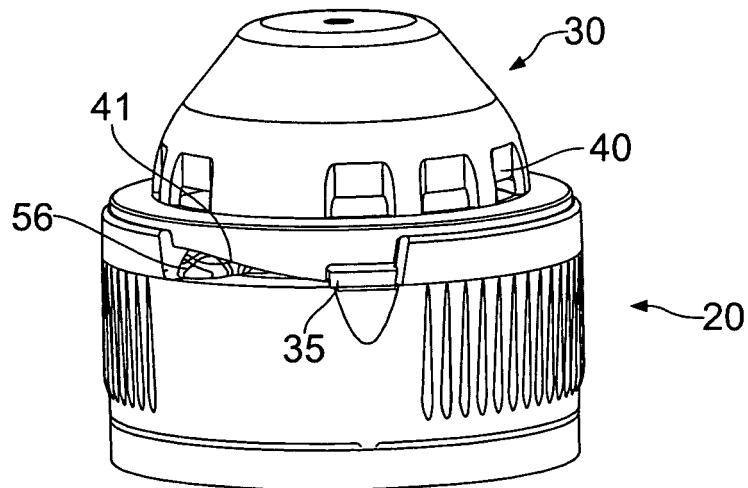


FIG. 9

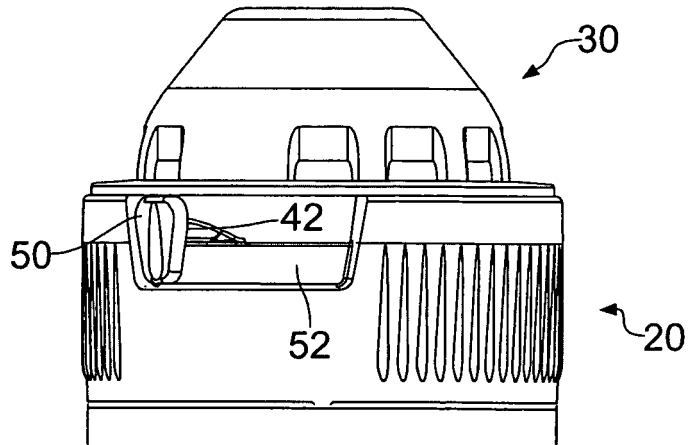


FIG. 10

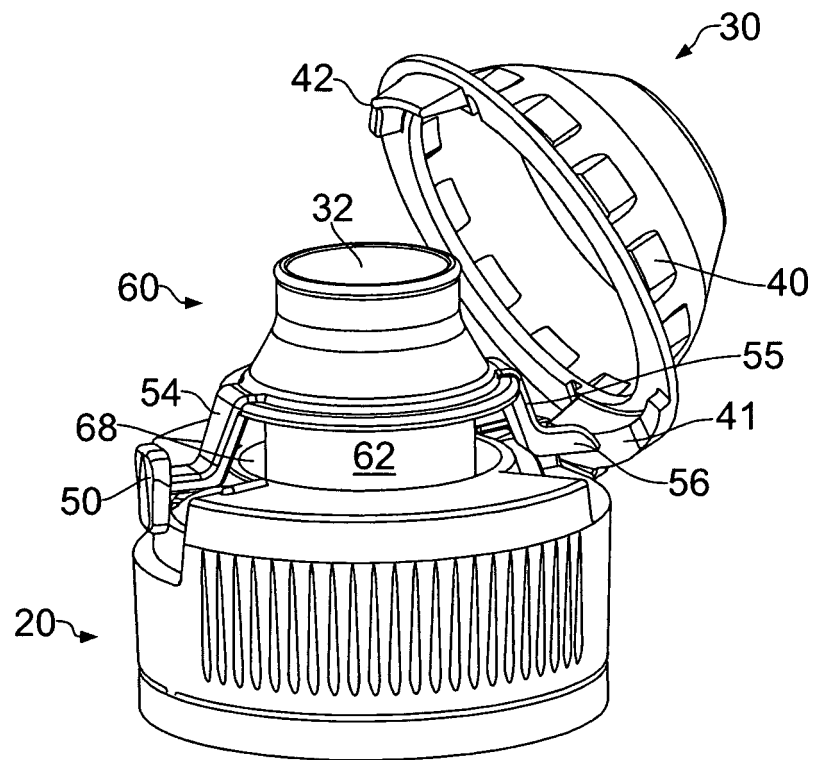


FIG. 11

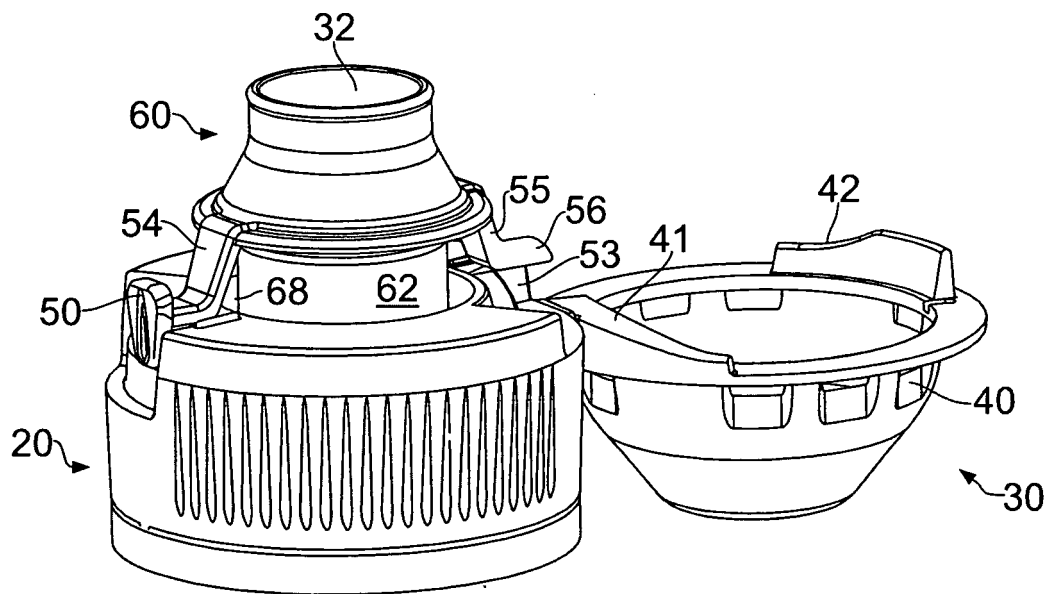


FIG. 12

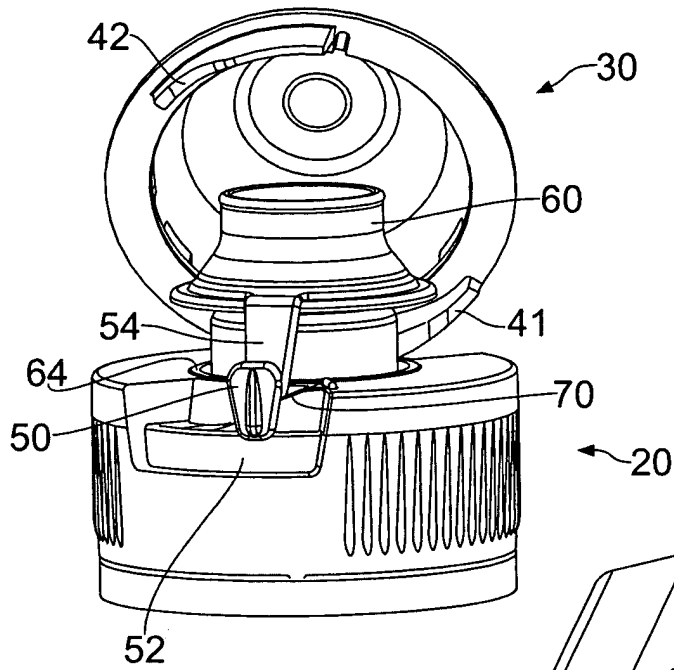


FIG. 13

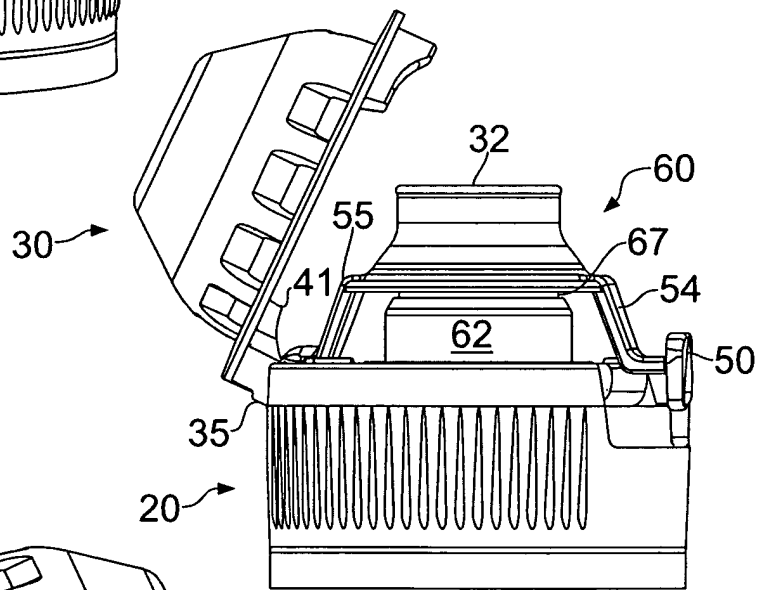


FIG. 14

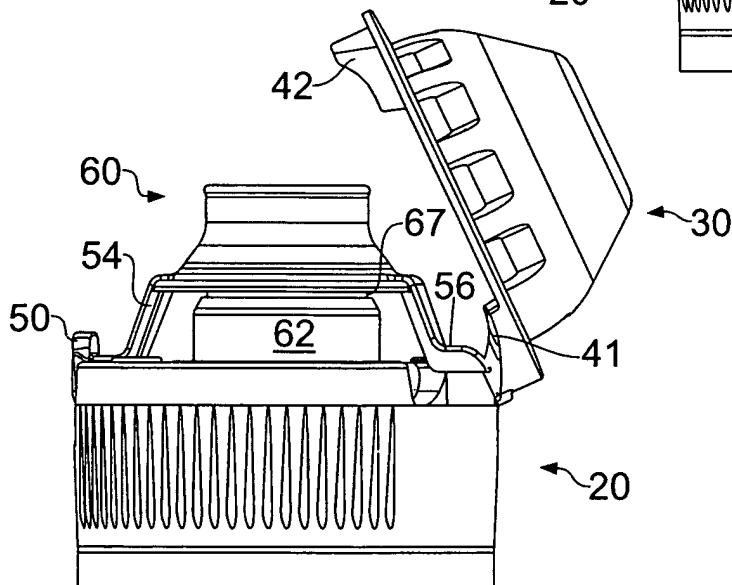


FIG. 15

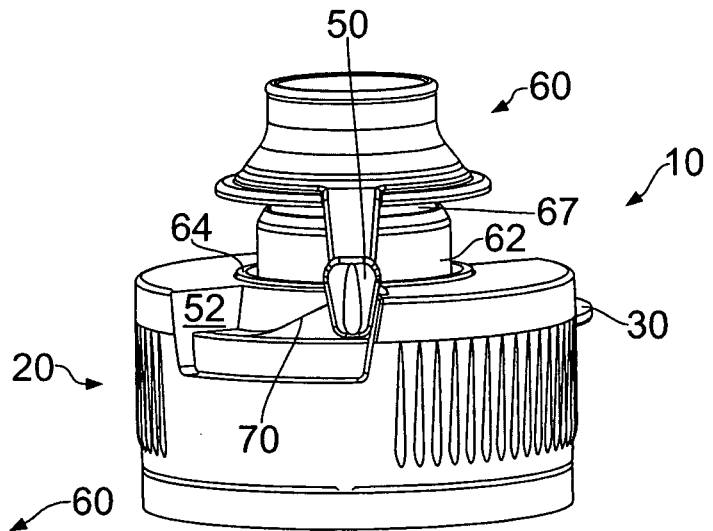


FIG. 16

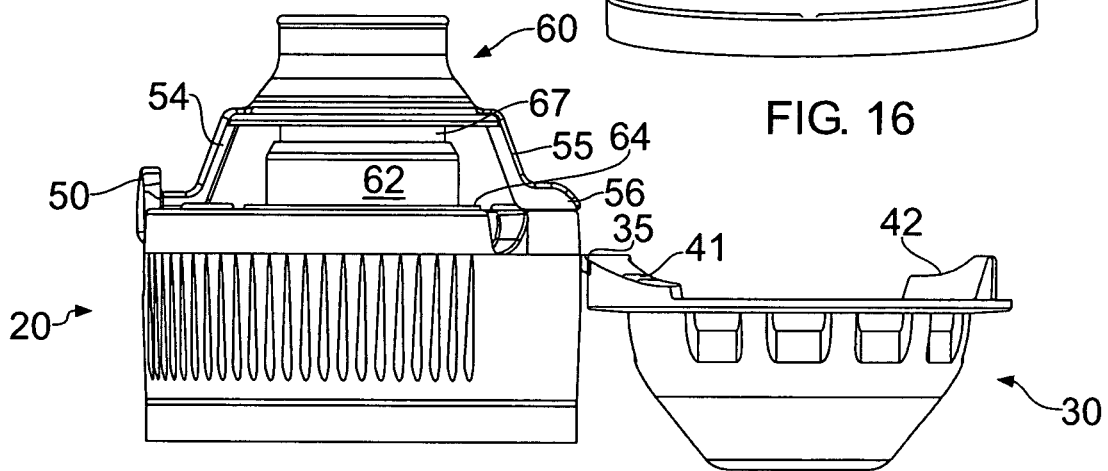


FIG. 17

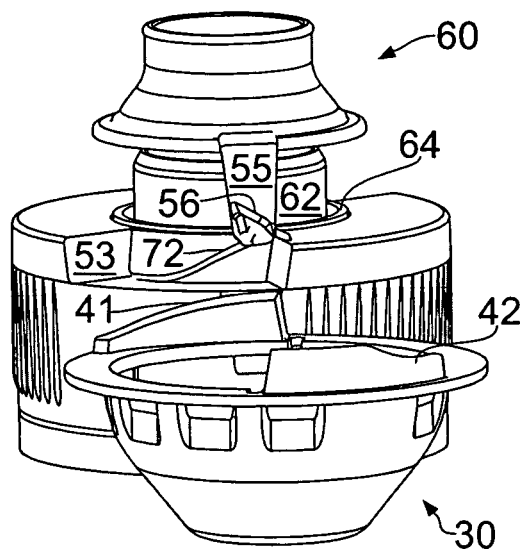


FIG. 18

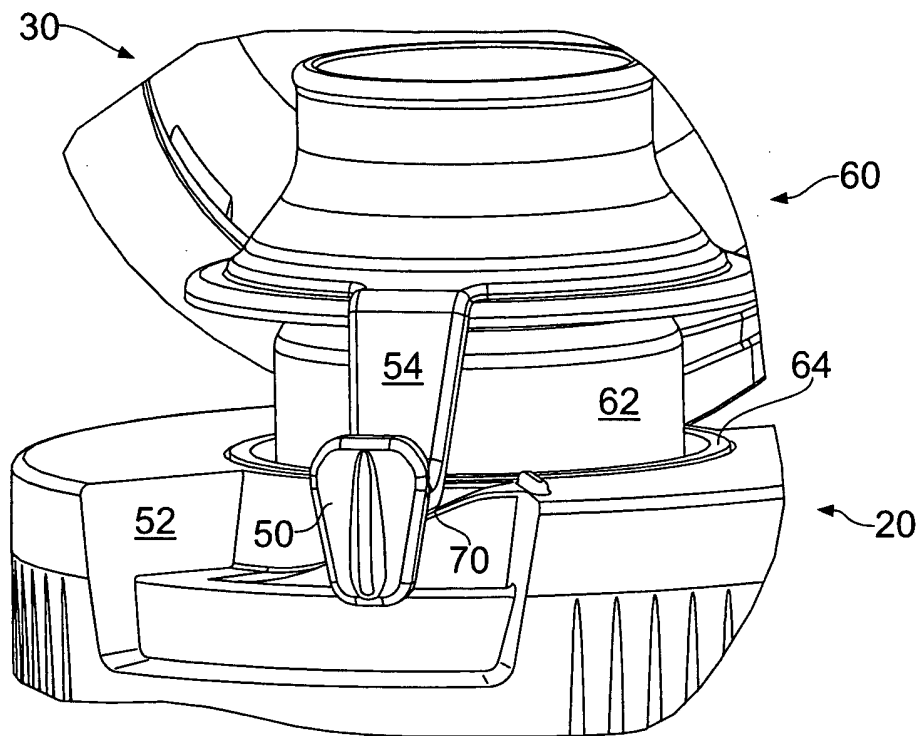


FIG. 19

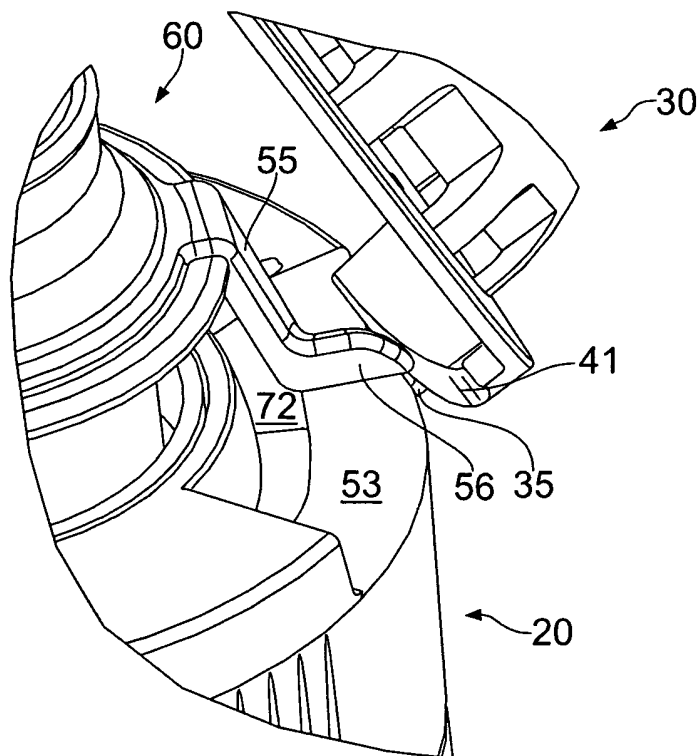


FIG. 20