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3,058,631

CONTAINER CLOSURES

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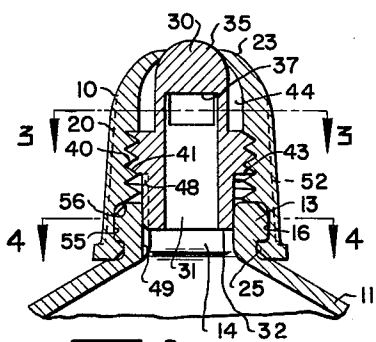


Fig. 1.

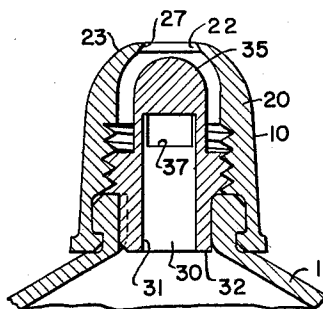


Fig. 2.

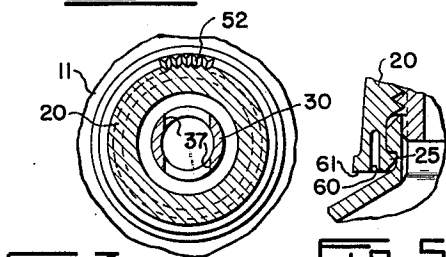


Fig. 3.

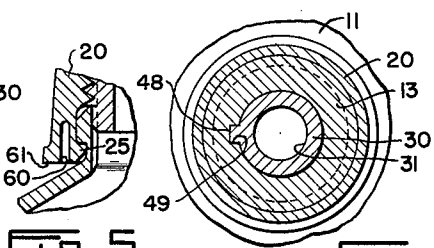


Fig. 4.

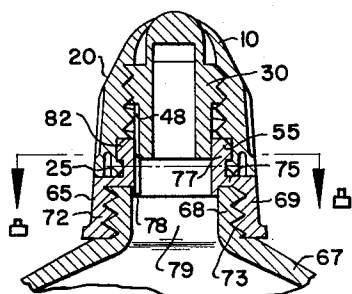


Fig. 6.

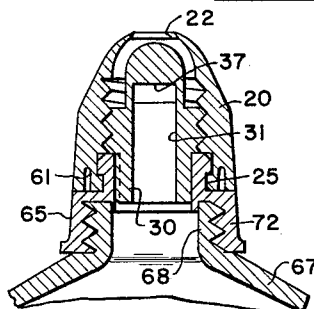


Fig. 7.

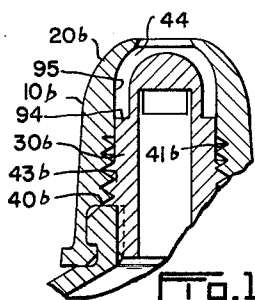


Fig. 10.

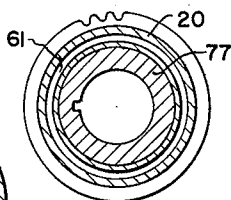
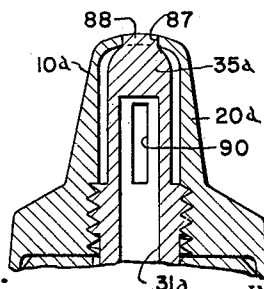


Fig. 8.

Fig. 9.



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CONTAINER CLOSURES

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9 Claims. (Cl. 222-507)

This invention relates to closures that are normally non-removable from containers of the type used for liquids, creams, pastes and the like.

An object of the present invention is the provision of a closure for containers, usually squeeze type containers, including a cap which may be rotated in opposite directions to move a plug therein to open and closed positions.

Another object is the provision of a container closure so constructed as to prevent the contents of the container from leaking out of the closure during and after discharge of said contents therefrom.

Another object is the provision of a container closure having a movable plug therein which is assembled into a unit that may be quickly and easily applied to a suitable container.

A still further object is the provision of a container closure having a rotatable cap which is so designed that said cap does not work against its mounting or retaining means on the container when the cap is rotated.

A closure container according to the present invention comprises a cap mounted for rotation on the neck of a container and having a dispensing opening at an outer end thereof, means at the cap for preventing movement thereof towards and away from the container, a hollow plug positioned within the cap and communicating at an inner end with the discharge passage of the neck, said plug being movable longitudinally of the cap towards and away from the dispensing opening thereof, a head on an outer end of the plug shaped to close the dispensing opening when the plug is moved towards said opening, said plug having an outlet therein bringing into communication the interiors of the plug and the cap, and shifting means between the plug and cap causing the plug to move towards and away from the dispensing opening on rotation of the cap in opposite directions to close and open said opening, whereby contents of the container may pass through the plug, outlet and dispensing opening when the latter is open, said contents being retained in the container when the opening is closed.

Examples of this invention are illustrated in the accompanying drawings, in which:

FIGURE 1 is a vertical section through one form of closure mounted on a container and shown in the closed position,

FIGURE 2 is a view similar to FIGURE 1, but with the closure in the open position,

FIGURE 3 is a horizontal section taken on the line 3-3 of FIGURE 1,

FIGURE 4 is a horizontal section taken on the line 4-4 of FIGURE 1,

FIGURE 5 is a fragmentary detail of a slight variation in the closure of FIGURE 1,

FIGURE 6 is a vertical section through an alternative form of closure mounted on a container and shown in the closed position,

FIGURE 7 is a view similar to FIGURE 6 showing the closure in the open position,

FIGURE 8 is a horizontal section taken on the line 8-8 of FIGURE 6,

FIGURE 9 is a sectional view similar to FIGURE 1, illustrating another alternative, and

FIGURE 10 is a fragmentary sectional view of a constructional variation which may be incorporated in any of the above-mentioned forms of the invention.

Referring to FIGURES 1 to 4 of the drawings, 10 is one form of closure mounted on a container 11. This con-

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tainer has a neck 13 at the top thereof with a discharge passage 14 extending therethrough. Although the container may be formed of any suitable material, this closure is primarily designed for squeeze-type containers which are formed of flexible material. Such a container is squeezed in order to force the contents thereof out through passage 14. However, if the container is not squeezable, this closure may be used on it if the contents thereof are liquid or semi-liquid. With this example of the invention, neck 13 of the container is formed with an out-turned bead 16 around the top thereof.

Closure 10 includes a cap 20 mounted for rotation on the neck 13 of container 11. This cap has a dispensing opening 22 at the outer end 23 thereof. The cap is provided with an inturned bead 25 fitting within or beneath the container bead 11. These two beads form means for preventing movement of cap 20 towards and away from container 11 while allowing said cap to be rotated on neck 13. The dispensing opening 22 is preferably circular in shape, and the cap is formed with a bevelled seat 27 inside thereof around this opening.

A plug 30 is positioned within cap 20 and formed with a hollow interior or passage 31 which communicates at the inner end 32 of the plug with the discharge passage 14 of the neck 13. This plug is movable longitudinally of the cap towards and away from the dispensing opening 22 thereof.

Plug 30 is formed with a head 35 on its outer end shaped to close dispensing opening 22 when the plug is moved towards said opening. It is preferable to make this head dome-shaped, as shown, to fit part way into the opening, as clearly shown in FIGURE 1. The dome-shaped head at this time bears against the bevelled seat 27 of the cap completely to close the opening. The plug has at least one outlet 37 therein bringing the interior 31 thereof into communication with the interior of cap 20. In this example, there are two outlets 37, as shown in FIGURE 3. These outlets are located just behind or beneath head 35.

Shifting means is provided between plug 30 and cap 20 to cause the plug to move towards and away from dispensing opening 22 on rotation of the cap in opposite directions to close and open said opening. In the illustrated example of the invention, this shifting means comprises threads 40 on the inner surface of the cap meshing with threads 41 formed on the outer surface of the plug. It will be noted that the plug threads are actually formed on the outer surface of an annular shoulder 43 on the plug, spaced from the ends thereof. This leaves a space 44 between the outer portion of plug 30 and the adjacent end of cap 20. The inner end of the plug slidably fits in passage 14 of the container neck. Suitable means is provided for preventing the plug from rotating, and this may be accomplished by forming a rib 48 on the outer surface of the plug near the inner end thereof and extending longitudinally of the plug, said rib fitting into a correspondingly-shaped groove 49 formed in the wall of passage 14, see FIGURE 4.

If desired, the outer surface of cap 20 may be formed with longitudinal grooves 52 or otherwise marked to form a gripping surface thereon.

By referring to FIGURES 1 and 2, it will be seen that cap 20 is actually cut out at 55 immediately above bead 25 to form a shoulder 56 which rests on the outer end of the container neck 13. As this shoulder is located at the end of cap threads 40, when the cap is rotated to move plug 30 inwardly, the shoulder 43 of said plug bears against the end of neck 13. This arrangement prevents any of the contents of the receptacle which may get into the cap and plug threads from running out from beneath the cap over the upper end of the container. The cut-out 55 is filled with bead 16, or, in other words, this bead slidably fits within the cut-out.

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FIGURE 1 shows the closure in the closed position. Cap 29 has been rotated to move plug 30 upwardly so that the head 35 snugly fits within the discharge opening 22 of the cap. Rib 48 prevents rotation of the plug at this time. When it is desired to remove some of the contents of container 11, the cap is rotated in the opposite direction to shift the plug inwardly to the position shown in FIGURE 2. Threads 40—41 are preferably of the quick-acting type which means that the plug moves a fair distance for a small degree of rotation of the cap. If container 11 is turned over or squeezed, contents thereof move through discharge passage 14, the interior 31 of the plug, out through outlets 37, and past head 35 and through the dispensing opening 22. As the contents move through space 44 within the cap, some comes into contact with threads 40—41. As stated above, the fact that shoulders 43 and 56 rest on the outer end of bead 13 when the closure is open results in the prevention of any of the contents from leaking out of the cap around bead 25. The fitting of container bead 16 in cut-out 55 helps to prevent any leakage.

Cap 20 and plug 30 may be formed of any suitable material. It has been found, however, preferable to form them of a suitable plastic material which is fairly stiff, but which may have a slight degree of resiliency. When the plug is screwed into the cap, they form a single unit which is ready to be applied to a container 11. Bead 25 is pressed down over bead 16, the resiliency of the cap and/or of the container neck 13 making this possible. When this is done, bead 25 snaps beneath bead 16 to retain the cap on the container while permitting rotation of said cap.

FIGURE 5 discloses a slight variation in the construction of cap 20. This cap is provided with a groove 60 in its free edge 61 just outside bead 25. This groove extends into the cap wall from the end and beyond the bead. This groove arrangement makes it a little easier to apply the cap to the container neck 13. The groove permits bead 25 to spring outwardly when it is moving past the container neck bead 16.

FIGURES 6 and 7 illustrate an adaptor 65 which may be used to mount closure 10 on a container 67 having a standard neck 68 at the top thereof, this neck being formed with external threads 69. This type of container usually has an internally-threaded cap, not shown, on the neck thereof.

The adaptor 65 is formed with a large end 72 which has internal threads 73 adapted to mesh with the neck threads 69. End 72 is formed with an annular inwardly-extending flange 75 which fits over the outer end of neck 68. A sleeve 77 projects outwardly from flange 75 and opens into the adaptor end 72. The sleeve may extend into said end a little at 78. This sleeve extension slidably fits into the discharge passage 79 of the neck. An out-turned bead 82 is formed on the outer end of sleeve 77 and fits into cut-out 55 of the cap immediately above bead 25 thereof. Sleeve 77 actually forms an extension of neck 68 of container 67.

Closure 10 of FIGURES 6 and 7 performs as described above. Adaptor 65 is screwed on to the container neck 68, and then cap 20, with plug 30 screwed therein, is pressed on to sleeve 75 of the adaptor. Cap bead 25 fits beneath the adaptor bead 82 to prevent movement of the cap towards and away from the container while permitting rotation of said cap. The rib 48 of plug 30 slidably fits into a longitudinal groove 84 formed in the inner wall of sleeve 77. This permits plug 30 to move longitudinally of the cap while preventing said plug from turning.

FIGURE 9 illustrates a slight modification of the closure. Cap 20a of closure 10a has a small dispensing opening 87 in its outer end, and plug head 35a has a tip 88 projecting therefrom snugly to fit in and close said opening. The outlets of plug 30a have been changed to slots 90.

Closure 10a functions in the same manner as the above-

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described closures. The difference being that dispensing opening 87 is much smaller than opening 22 of closure 10, and tip 88 projects from the plug end to fit into opening 87 to close the closure. When the cap is rotated in the proper direction, plug 30a is moved inwardly or downwardly to withdraw tip 88 from the dispensing opening. Cap 20a may or may not have a groove corresponding to groove 60 of FIGURE 5, and if desired, adaptor 65 may be used with closure 10a.

FIGURE 10 illustrates another slight modification in a closure 10b. The threaded shoulder 43b of plug 30b is extended upwardly beyond the threads 40b thereof to form an extension 94 that slidably fits into the cylindrical inner wall 95 of cap 20b.

The extension 94 remains within the cylindrical wall 95 even when the closure is open, as illustrated. This helps to keep the contents of the container that are in space 44b away from threads 40b—41b and thereby helps to prevent the contents from leaking out from beneath the cap.

What I claim as my invention is:

1. A normally non-removable closure for containers for liquids, creams, pastes and the like and having neck means with discharge passages extending therethrough, comprising a cap mounted for rotation on the neck means of the container and having a dispensing opening at an outer end thereof, co-operating means on the cap and on the neck means for preventing movement of said cap towards and away from the container, a hollow plug positioned within the cap and communicating at an inner end with the discharge passage of the neck means, said plug being movable longitudinally of the cap towards and away from the dispensing opening thereof, means for preventing rotation of the plug, a head on an outer end of the plug shaped to ultimately close the dispensing opening when the plug is moved towards said opening, an annular shoulder on and extending longitudinally of the plug spaced from the ends thereof and cross-sectionally filling the cap, threads on the inner surface of the cap, and threads on the outer surface of said annular shoulder meshing with said threads on the inner surface of the cap to cause the plug to move towards and away from the dispensing opening on rotation of the cap in opposite directions to close and open said opening, said plug having an outlet therein between the annular shoulder and the plug head, said shoulder being positioned to bear against the container neck means when the plug is moved to withdraw the head from the dispensing opening, whereby the annular shoulder prevents contents of the container from leaking out between the cap and neck means.

2. A container closure as claimed in claim 1 in which the annular shoulder extends beyond the threads thereof and the threads on the inner surface of the cap towards the dispensing opening to form an extension slidably fitting within the cap.

3. A container closure as claimed in claim 1 in which the hollow plug slidably extends into the passage of the container neck means.

4. A container closure as claimed in claim 1 in which the co-operating means for preventing movement of the cap towards and away from the container comprises an intumed bead on the cap fitting within an outturned bead connected to the container neck means.

5. A normally non-removable closure for containers for liquids, creams, pastes and the like and having externally-threaded necks with discharge passages extending therethrough, comprising an internally-threaded adaptor screwed on the container neck and having an inner and an outer end, a passage through the adaptor aligned with the neck passage, a cap mounted for rotation on the outer end of the adaptor and having a dispensing opening at an outer end thereof, co-operating means on the cap and on the container for preventing movement of the cap towards and away from the container, a hollow plug positioned within the cap and communicating at an inner end with the passage of the adaptor, said plug being movable

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ble longitudinally of the cap towards and away from the dispensing opening thereof, means for preventing rotation of the plug, a head of an outer end of the plug shaped to ultimately close the dispensing opening when the plug is moved towards said opening, an annular shoulder on and extending longitudinally of the plug spaced from the ends thereof and cross-sectionally filling the cap, threads on the inner surface of the cap, and threads on the outer surface of said annular shoulder meshing with said threads on the inner surface of the cap to cause the plug to move towards and away from the dispensing opening on rotation of the cap in opposite directions to close and open said opening, said plug having an outlet therein between the annular shoulder and the plug head, said shoulder being positioned to bear against the outer end of the adaptor when the plug is moved to withdraw the head from the dispensing opening, whereby the annular shoulder prevents contents of the container from leaking out between the cap and the adaptor.

6. A container closure as claimed in claim 5 in which the co-operating means for preventing movement of the cap towards and away from the container comprises an intumed bead on the cap fitting within an out-turned bead connected to the adaptor.

7. A container closure as claimed in claim 5 in which the hollow plug slidably extends into the adaptor passage.

8. A normally non-removable closure for containers for liquids, creams, pastes and the like and having externally threaded necks with discharge passages extending therethrough, comprising an adaptor having an internally-threaded large end screwed on the container neck, an annular inwardly-extending flange on said large end fitting over the end of the container neck, a sleeve projecting outwardly from the flange and opening into said large end, said sleeve extending into the large end and fitting within the neck, said sleeve forming a passage through the adaptor and aligned with the neck passage, a cap mounted for rotation on the sleeve and having a dispensing opening at an outer end thereof, co-operating means on the cap and on the sleeve for preventing movement of the cap towards and away from the container, a hollow plug positioned within the cap and communicating at an inner end with the passage of the adaptor, said plug being movable longitudinally of the cap towards and away from the dispensing opening thereof, means for preventing rotation of the plug, a head on an outer end of the plug shaped to close the dispensing opening when the plug is moved towards said opening, an annular shoulder on and extending longitudinally of the plug spaced from the ends thereof and cross-sectionally filling the cap, threads on the inner surface of the cap, and threads on the outer surface of said annular shoulder meshing with

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said threads on the inner surface of the cap to cause the plug to move towards and away from the dispensing opening on rotation of the cap in opposite directions to close and open said opening, said plug having an outlet therein between the annular shoulder and the plug head, said shoulder being positioned to bear against the adaptor sleeve when the plug is moved to withdraw the head from the dispensing opening, whereby the annular shoulder prevents contents of the container from leaking out between the cap and the adaptor sleeve.

9. A normally non-removable closure for containers for liquids, creams, pastes and the like and having neck means with a discharge passage extending therethrough, comprising a cap mounted for rotation on the neck means of the container and having a dispensing opening at an outer end thereof, said cap being formed with a free edge surrounding the neck means, an out-turned bead connected to the neck means, an intumed bead on the cap near the free edge thereof fitting below said out-turned bead for preventing movement of said cap towards and away from the container, said cap having a groove formed in the free edge thereof just outside said intumed bead to permit the latter bead to spring outwardly when being forced past said out-turned bead, a hollow plug positioned within the cap and communicating at an inner end with the discharge passage of the neck means, said plug being movable longitudinally of the cap toward and away from the dispensing opening thereof, means for preventing rotation of the plug, a head on an outer end of the plug shaped to close the dispensing opening when the plug is moved towards said opening, an annular shoulder on and extending longitudinally of the plug spaced from the ends thereof and cross-sectionally filling the cap, threads on the inner surface of the cap, and threads on the outer surface of said annular shoulder meshing with said threads on the inner surface of the cap to cause the plug to move towards and away from the dispensing opening on rotation of the cap in opposite directions to close and open said opening, said plug having an outlet therein between the annular shoulder and the plug head, said shoulder being positioned to bear against the container neck means when the plug is moved to withdraw the head from the dispensing opening, whereby the annular shoulder prevents contents of the container from leaking out between the cap and neck means.

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