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2,700,784

BALL TYPE LIQUID APPLICATOR AND CLOSURE FOR SAME

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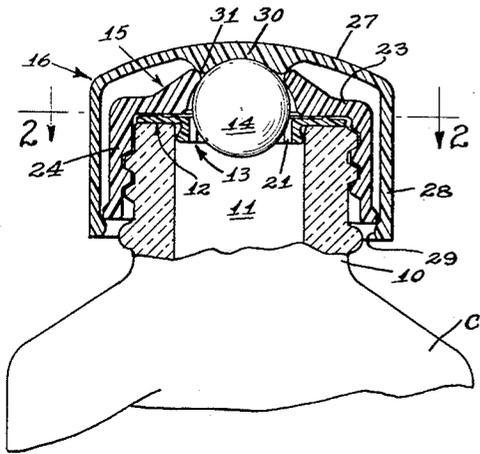


Fig. 1.

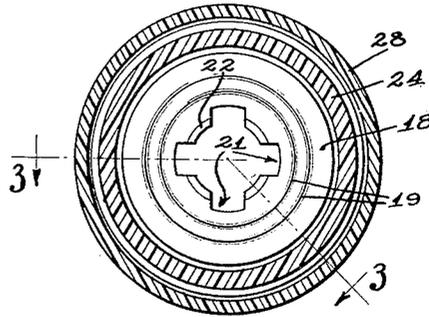


Fig. 2.

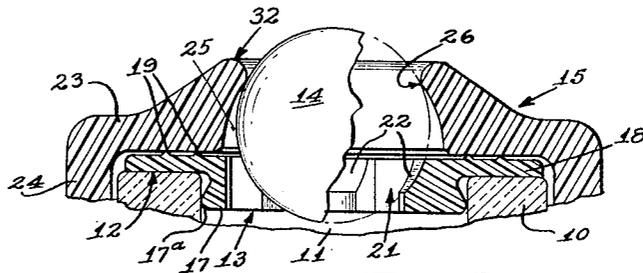


Fig. 3.

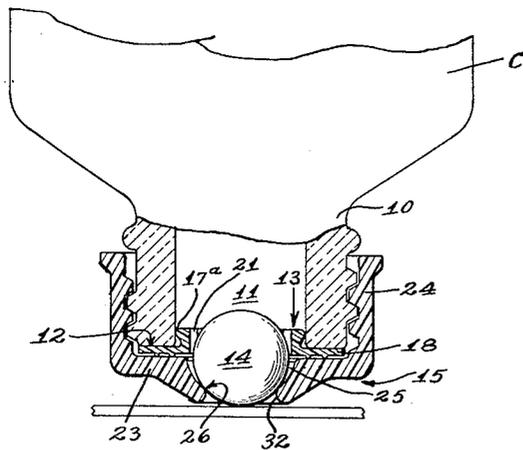


Fig. 4.

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2,700,784

BALL TYPE LIQUID APPLICATOR AND CLOSURE FOR SAME

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2 Claims. (Cl. 15—132.7)

The present invention relates to improvements in liquid dispensers and applicators for liquid deodorants and the like, and more particularly to that type of device wherein a spherical element, or ball, functions as the dispenser and applicator.

An object of my invention is the provision of novel structure whereby exceptionally effective sealing is obtained while providing simple and readily operable dispensing and applying means.

A further object is the provision of novel structure for sealing the container independently of the liquid applicator ball.

It is also an object to provide a readily removable outer cover, which has effective sealing engagement with a ball retaining lip at the discharge opening.

It is likewise an object of my invention to provide a ball type applicator in which the ball is movable axially of a container neck opening and wherein positive sealing of the container may be effected by means wholly independent of such ball.

Further, it is an object of my invention to provide a structure as aforesaid, wherein an outer cover, when used as such, has sealing engagement with an outer retainer for the ball.

Finally, it is an object of my invention to provide in a device of the above character, an inner ball support which incorporates means for sealing contact both with the neck end and neck interior and which is capable of axial flexing in response to axial movement of the ball between open and closed positions.

Other objects will be in part apparent and in part pointed out in the appended claims.

In the drawings:

Fig. 1 is a sectional elevational view of my closure and applicator affixed to a container;

Fig. 2 is a sectional view taken along the line 2—2 of Fig. 1;

Fig. 3 is an enlarged fragmentary sectional view of my closure and applicator, taken along the line 3—3 of Fig. 2; and

Fig. 4 is a sectional elevational view illustrating the manner of use as an applicator.

I have illustrated my closure and applicator as used upon a glass container C, having a reduced externally threaded neck 10, providing a filling and discharge opening 11. This neck also has an annular top sealing surface 12.

The general organization of elements includes an inner support 13 for the spherical element, or ball 14, an outer ball retainer and sealing device 15, which is removably attached to the container and holds said inner support in sealing contact with the sealing surface 12 of the container and a cover 16 which snaps over the outer ball retainer 15 and has sealing engagement with the ball 14 and adjacent wall of the opening through which a portion of the ball projects.

The inner support 13, which is formed of polyethylene, or some material having like characteristics as to softness, pliability and sealing effectiveness, consists of a collar 17, of such external diameter as to be received in the container neck opening 11. This collar decreases in cross-section upwardly such that at its lower end there is provided an external annular rib 17^a, which has sealing contact with the inner wall of the neck opening 11. At the upper end of this collar is a radial flange 18, or gasket, which overlies the sealing surface 12. This flange may be provided with one or more circular beads 19 on its

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upper side for engagement with the retainer 15, which, in addition to functioning as an outer retainer for the ball, serves to firmly press the flange 18, or gasket against the sealing surface 12 and prevent leakage of the fluid contents. The presence of the beads 19 reduces the area of frictional contact between the retainer 15 and the flange 18 and thereby facilitates attachment of said retainer. The wall of the opening through the collar is provided with one, or more discharge channels 21 and between these channels is formed with arcuate surfaces 22, which together form a seat for the ball 14.

The combined ball retainer and sealing device 15 includes a circular top portion 23 and a depending internally screw-threaded attaching skirt 24, or flange, for holding engagement with the threaded neck of the container. The top portion 23 is thickened centrally and provided with a generally frusto-conical axial opening 25, the lower large diameter end being of somewhat greater diameter than the ball and the upper end being of such diameter that it will permit only a small part of the ball to project outwardly therethrough. Thus an annular lip 26 having a relatively narrow line contact with the applicator ball is provided. This retainer 15 is formed of some relatively hard phenolic resin. By reason of this narrow line contact, use of a relatively hard material and axial flexibility of the collar 13 which permits slight separation of the ball from contact with the lip 26, the liquid contents may be discharged as a thin film incident to rotation of the ball when the container is positioned as in Fig. 4.

The cover 16, which preferably is formed of polyethylene or similar material, consists of a top portion 27 and a skirt 28, the latter having an internal bead, or rib 29, at its lower end to snap over the bottom end of the skirt of the retainer 15. Thus the cover is held in place securely, yet may be removed without difficulty. Centrally and internally of the top portion is an integral sealing pad 30, recessed to provide firm contact with the projecting part of the ball and having an annular shoulder 31 which seals against the lip 32 of the discharge opening in said retainer 15.

It is readily apparent from the foregoing that with the parts positioned as shown in Fig. 1, the container is perfectly sealed at four points, viz, the collar against the inside of the neck, the flange, or gasket upon the top sealing surface of the neck, the ball against the lip of the discharge opening and the cover at the lip of the discharge opening. Removal of the cover 16 and inversion of the container followed by rolling contact of the ball with the surface to which the liquid is to be applied results in discharge and application of the liquid contents in film form.

Modifications may be resorted to within the spirit and scope of the appended claims.

I claim:

1. A device of the character described attachable to the neck of a container, which neck has an annular rim providing a sealing surface, and an axial bore having a wall merging with a margin of said rim; said device comprising a collar adapted for projection into the bore and formed with an annular external rib adapted for sealing contact with the wall of said bore, said collar having an opening coaxial with the bore when assembled with the neck, the wall of said opening being provided with a series of circumferentially spaced channels each of which extends the length of said collar, those portions of said wall between the channels being shaped to provide a ball valve seat facing axially outwardly of the neck when assembled with the latter, a radial flange on said collar adapted for sealing contact with the rim of the neck, said collar and flange formed of a resilient material, a ball valve positioned on said seat with portions extending beyond opposite ends of the collar, a primary sealing and ball retaining means including a top portion having a wall overlying said radial flange formed with an opening axially aligned with the opening in said collar, an attaching flange on said wall for securing the ball retaining means to the neck when assembled with the latter, said axial opening in the wall diminishing in diameter to

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ward its upper end to provide a narrow annular surface for contact with the ball valve.

2. A device of the character described attachable to the neck of a container, which neck has an annular rim providing a sealing surface, and an axial bore having a wall merging with a margin of said rim; said device comprising a collar adapted for projection into the bore and formed with an annular external rib adapted for sealing contact with the wall of said bore, said collar having an opening coaxial with the bore when assembled with the neck, the wall of said opening being provided with a series of circumferentially spaced channels each of which extends the length of said collar, those portions of said wall between the channels being shaped to provide a ball valve seat facing axially outwardly of the neck when assembled with the latter, a radial flange on said collar adapted for sealing contact with the rim of the neck, said collar and flange formed of a resilient material, a ball valve positioned on said seat with portions extending beyond opposite ends of the collar, a primary sealing and ball retaining means including a top portion having a wall overlying said radial flange formed with an opening axially aligned with the opening in said collar, an at-

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taching flange on said wall for securing the ball retaining means to the neck when assembled with the latter, said axial opening in the wall diminishing in diameter toward its upper end to provide a narrow annular surface for contact with the ball valve, and a removable closure having an internal protuberance positioned for sealing contact with the ball valve and adjacent portions of the ball retaining means.

References Cited in the file of this patent

UNITED STATES PATENTS

600,299	Werner	Mar. 8, 1898
785,116	Perry	Mar. 21, 1905
1,977,414	Testa	Oct. 16, 1934
2,122,580	Morris	July 5, 1938
2,377,117	Watkins	May 29, 1945
2,409,847	Gregg	Oct. 22, 1946
2,641,788	Sudbeaz	June 16, 1953

FOREIGN PATENTS

270,136	Switzerland	Nov. 1, 1950
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