

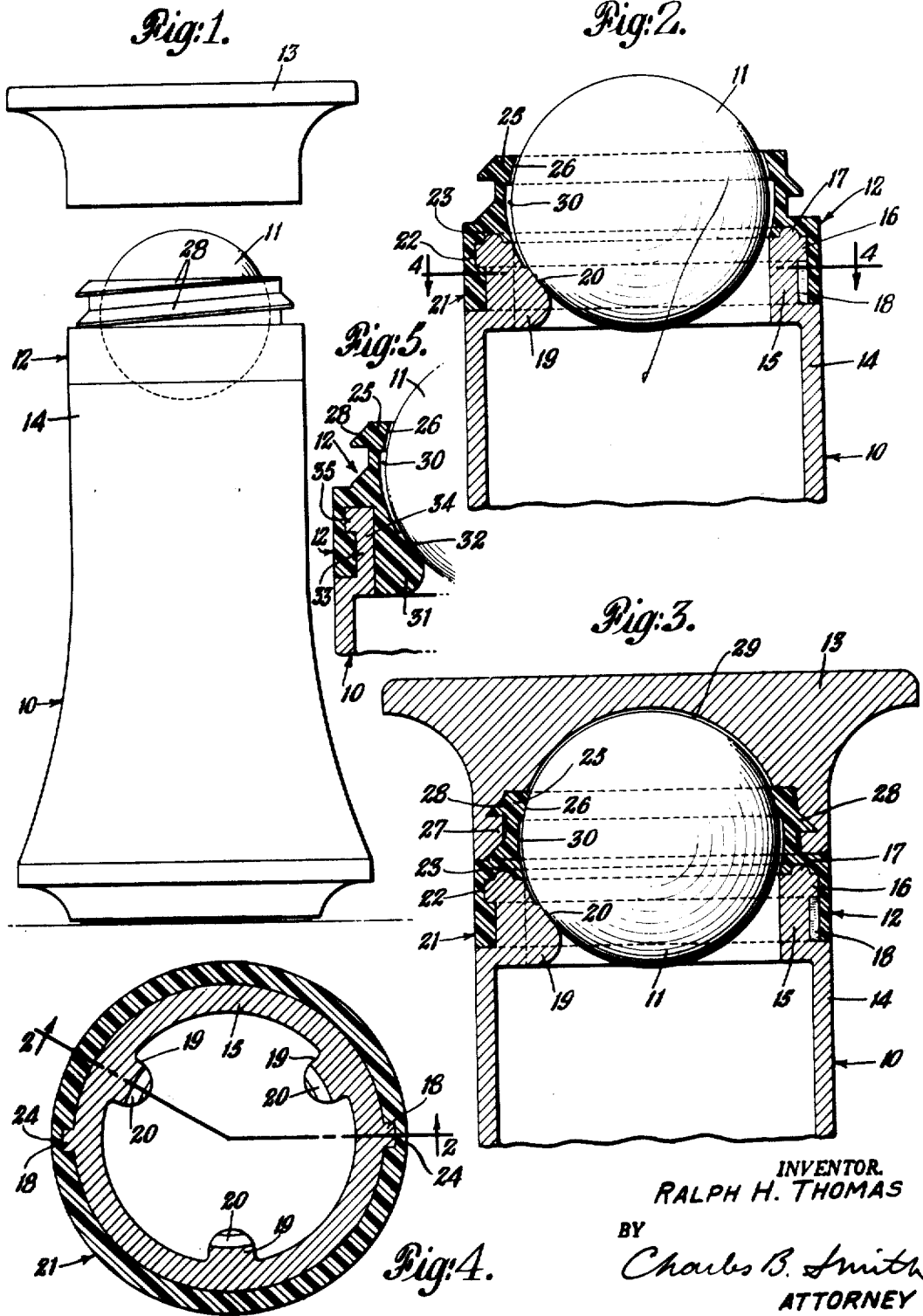
June 12, 1956

R. H. THOMAS
DISPENSER

2,749,566

Filed Sept. 4, 1952

2 Sheets-Sheet 1



INVENTOR.
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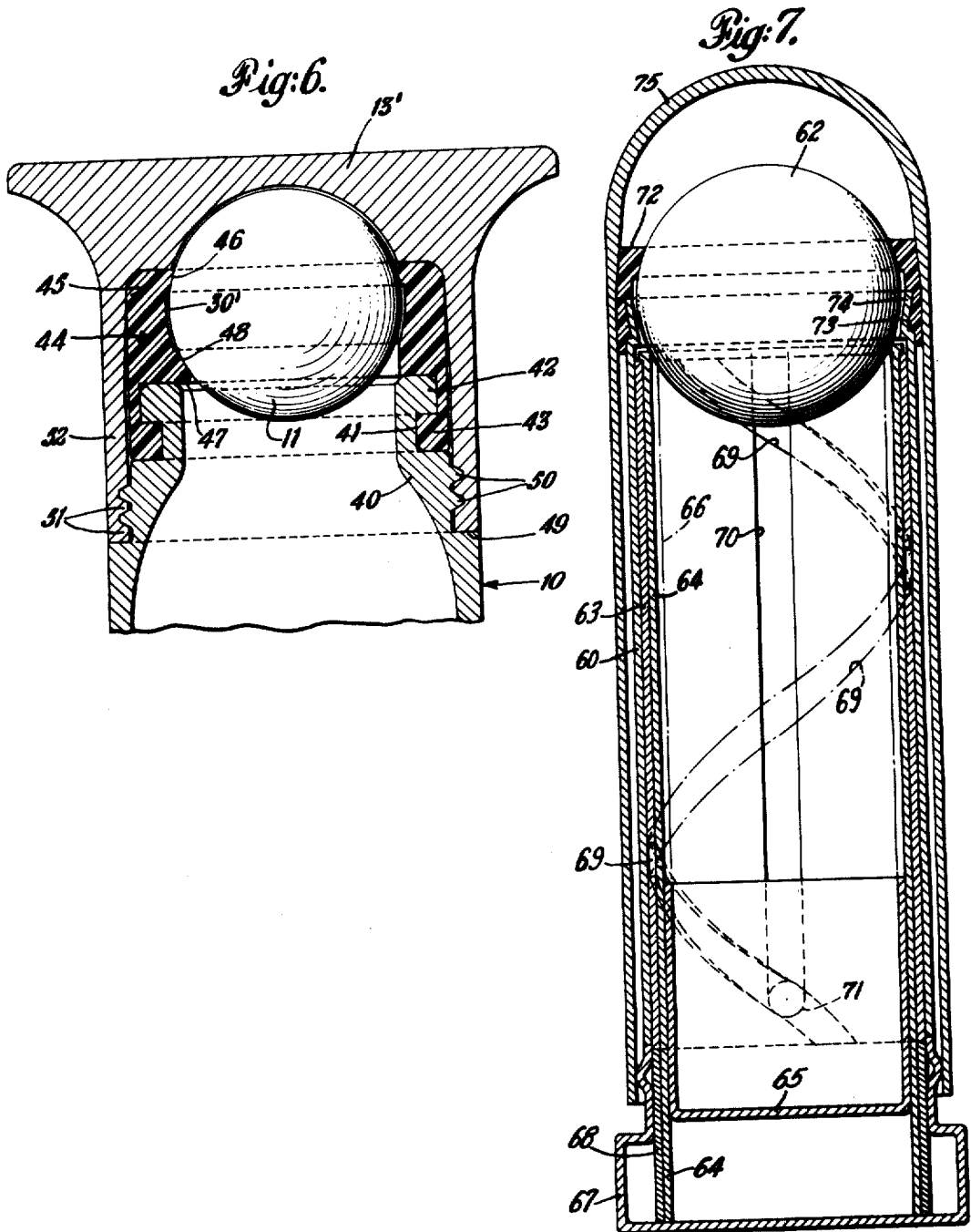
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2 Sheets-Sheet 2



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2,749,566
DISPENSER

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Application September 4, 1952, Serial No. 307,750

14 Claims. (Cl. 15—132.7)

The present invention relates to fluid dispensing containers and more particularly to ball-top containers for dispensing liquid, pasty or creamy fluids such as deodorants, lotions and the like.

An object of the invention has been to provide a simple, easily fabricated dispenser for deodorants, lotions or other flowable substances which is constructed with a revolvable ball-dispensing valve adapted to be pressed against and rolled over the surface to which the flowable substance is to be applied.

Another object of the invention has been to provide a dispenser of the above type which will not leak, and which will substantially prevent any evaporation of the dispenser's contents.

A further object of the invention has been to provide a dispenser of the above type which will be ready for instant use at all times.

A feature of the invention has been the provision of a resilient snap-on ring for retaining the ball in the desired position in the open end of the container.

Another feature of the invention has been the provision of a reservoir within which a quantity of flowable substance is retained in contact with the ball by capillary attraction.

Still another feature of the invention has been the provision of means for sealing the ball against leakage and evaporation when not in use, which means is subjected to horizontal compression by a camming action.

Other and further objects, features and advantages of the invention will appear from the following description.

In accordance with the invention, these objects are achieved by providing a container, such as a bottle, having an open end, a generally spherical ball adapted to fit partially within the open end of the container, means for rotatably supporting the ball partially within the open end of the container, the means comprising an annular ring having a relatively flexible bearing portion adapted to encompass a portion of the ball and retain the same against movement outwardly of the open end of the container and a clamping portion thereof adapted firmly to engage the container adjacent the open end thereof, and a hollow, relatively stiff cap adapted releasably to engage the bearing portion of the ring and to urge the same firmly into engagement with the ball to prevent leakage of the fluid within the container past the ball when the cap is engaged with the bearing portion of the ring. The supporting means for the ball also includes a plurality of bearing surfaces located within the open end of the container and which may be formed integrally with the container or the annular ring. In accordance with a further feature of the invention, the annular ring is provided with a fluid reservoir within which fluid is retained in contact with a portion of the ball by capillary attraction.

The invention will now be described in greater detail with reference to the appended drawing in which:

Fig. 1 is an elevational view of a fluid dispenser, constructed in accordance with the invention, and having the cap shown removed from the applying end;

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Fig. 2 is an enlarged longitudinal sectional view of the applying end of the dispenser of Fig. 1 with the cap removed and the dispenser ready for use, the view of Fig. 2 being taken along the line 2—2 of Fig. 4;

Fig. 3 is a sectional view similar to Fig. 2, but with the cap in position closing the applying end;

Fig. 4 is a sectional view of the container neck and ball retaining ring taken along the line 4—4 of Fig. 2, the ball applicator being omitted for clarity;

Fig. 5 is a fragmentary sectional view, similar to a portion of Fig. 2, and illustrating a modification of the construction according to the invention;

Fig. 6 is a sectional view, similar to Fig. 3, and illustrating another modification of the construction according to the invention; and

Fig. 7 is a sectional elevational view of an alternative form of the dispenser especially adapted to dispense viscous or semi-solid materials.

Referring now to the drawing and more particularly to Figs. 1-4 thereof, the dispenser comprises generally a container or bottle portion 10, forming a main reservoir for a fluid such as a liquid, creamy or pasty deodorant, hand or face lotion, hair tonic and the like, a generally spherical ball applicator 11, an annular ball-retaining ring 12 and a cap 13 for closing the applying end.

The bottle 10, which may be formed of any convenient material, such as glass or styrene, may be given any desired shape, but is preferably provided with a generally cylindrical portion 14 adjacent the open end thereof. The open end of the bottle is preferably formed as a reduced diameter neck 15 having an outwardly extending flange 16 at the outer end thereof. The upper surface of the neck 15, as shown in Figs. 2 and 3, may be provided with a projecting ring or bump 17 of semi-circular cross-section to provide an additional leak-preventing seal. Between the cylindrical portion 14 and the flange 16, the neck 15 may be provided with one or more relatively narrow outwardly extending keys 18. As shown in Fig. 4, two keys 18 are provided on opposite sides of the neck 15.

The inner surface of the neck 15 is provided with spaced inwardly extending projections or lugs 19 each having a bearing surface 20 arranged to support the ball 11 for rotation in any direction about its center. The lugs 19 serve to retain the ball 11 from lateral motion and also assist in retaining the same at the desired position partially within the open end of the container 10. As shown in Fig. 4, there are three evenly spaced lugs 19. The ball 11, which is preferably formed of glass or other material the dimensions of which can be accurately controlled, is supported on the surfaces 20, but preferably does not come in contact with any other portion of the container 10. The annular ring 12 is provided with an annular clamping portion 21 which is adapted to snap on over the outside of the neck 15. To facilitate the snap-on operation and also to facilitate a sealing operation to be described, the ring 12 is preferably formed of a relatively resilient material such as polyethylene. The outside diameter of the clamping portion 21 is preferably about equal to that of the portion 14 of bottle 10. The thickness and inside configuration of the clamping portion 21 should be selected to match the outside of the bottle neck 15. For this purpose, the portion 21 is provided with recesses 22 and 23 extending around the circumference thereof and adapted to accommodate the flange 16 and the ring 17, respectively. As shown in Fig. 4, a pair of recesses 24 are provided in the portion 21 to accommodate the keys 18, the keys thus preventing rotation of the ring 12 about the top of the bottle 10. When the ring 12 is snapped on over the neck 15, the flange 16, ring 17 and keys 18 and their accommodating recesses serve to retain the ring 12 firmly in place about the neck 15.

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The ring 12 is also provided with an annular bearing portion 25 preferably located above the center of the ball 11. As shown in Fig. 2, in which figure the cap 13 is not in place, a bearing surface 26 of the portion 25 is spaced from the ball 11 by a small amount. The spacing between the ball 11 and the bearing surface 26 should be sufficiently great that the fluid carried on the surface of the ball 11 as the same is rotated is not wiped off by contact with the surface 26. However, this spacing is preferably sufficiently small that the ball 11 will be kept substantially in position in the bottle neck when the bottle is inverted. In a preferred embodiment of the invention intended for dispensing a fairly thick creamy deodorant and having a ball radius of about 0.365 inch, the bearing surface 26 was formed with a radius of about 0.369 inch, giving a clearance of about 0.004 inch. The dimensions, which are given solely for purposes of illustration, are not intended to limit the invention in any way, and of course would vary depending on the consistency of the lotion to be dispensed.

The outer surface of the portion 25 is adapted to engage the inner surface of the cap 13. For this purpose, the cap 13 may be provided with internal threads 27 and the portion 25 with matching external threads 28. The inside of the cap 13 tapers inwardly from the open end thereof so that the root diameter of the threads at the open end of the cap 13 is greater than the root diameter thereof further inside the cap. The root diameter of the threads provided adjacent the inside end of the cap is somewhat less than the corresponding dimension of the threads provided on the ring 12 so that, when the cap 13 is screwed down on the ring 12, an inwardly or horizontally directed force is exerted on the bearing portion 25 of the ring 12. This force urges the portion 25 to move inwardly and results in the surface 26 firmly engaging the ball 11, as shown in Fig. 3. The engagement of the surface 26 and the ball 11 provides an effective seal to prevent leakage of fluid or evaporation when the cap is in place. In order for proper sealing action to be achieved, the ring 12 should be more resilient than the cap 13 so that the compressive force exerted as the cap is screwed down results in an inward deformation of the portion 25 rather than an outward deformation of the cap 13. This difference in resiliency is preferably achieved by making the ring 12 and the cap 13 of different materials. Thus, the cap might conveniently be formed of styrene while the ring might be formed of polyethylene, the latter being more resilient than the former. The desired relative stiffness of the cap 13 and the ring 12 might also be secured by providing the former with thicker walls than the latter.

The amount of internal taper required in the cap 13 is dependent on the normal spacing of the surface 26 and the ball 11. Preferably, the taper is selected so that the firm sealing action desired is achieved when the cap is completely screwed on so that the outer end of the cap rests on the opposing edge of the ring 12.

As shown in Fig. 3, the cap 13 is provided with a hollow dome portion 29 adapted to accommodate the upper portion of the ball 11.

Since the internal diameter of the ring 12 at the surface 26 is less than the diameter of the ball 11, it will be observed that the portions 25 of the ring 12 should be able to flex outwardly to allow the ball 12 to be passed therethrough in assembling the dispenser. Alternatively, the ball 11 may be seated first and the ring 12 passed thereover before being snapped on over the neck 15. The tight fit provided between the ring and the neck 15 prevents leakage of the fluid therebetween.

When it is desired to use the dispenser, the cap is unscrewed, the bottle 10 is wholly or partially inverted and the ball 11 is placed in contact with and rolled over the surface to which the fluid is to be applied. When the bottle is inverted, the fluid therein contacts the lower portion of the ball 11, wetting the ball and adhering thereto.

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As the ball 11 is rolled, the portion thereof to which fluid has adhered will be carried beyond the surface 26 and into contact with the surface to which the fluid is to be applied. At the same time, another portion of the ball 11 is brought into contact with the fluid in the bottle.

In order that the application of the fluid be effected as expeditiously as possible, it is desirable that a relatively large portion of the surface of the ball 11 be in a position to contact the fluid within the bottle. As will be observed from Fig. 2, the entire ball area inwardly of the surface 26, with the exception of those portions engaged by the bearing surfaces 20, may be contacted with fluid.

A portion of the inside surface of the ring 12 inwardly of the surface 26 and an abutting portion of the inner surface of each of the lugs 19 upwardly of the surfaces 20 are recessed to provide an auxiliary reservoir 30. During a dispensing operation, fluid flows from the main reservoir constituted by the container 10 into the auxiliary reservoir 30. When the dispenser is returned to an upright position, fluid is retained within the reservoir 30 and in lubricating contact with the adjacent surface of the ball 11 by capillary attraction. In order for capillary attraction to be effective in forming a liquid seal within the reservoir 30, the walls thereof must have a relatively small spacing. In other words, the spacing between the outer surface of ball 11 and the adjacent inner surface of the ring 12 in the reservoir area must be small enough for capillary attraction to take place. However, the spacing should be too small as otherwise it would interfere with the flow of fluid into the reservoir when the dispenser is wholly or partially inverted for use. It is evident that the spacing desired will be dependent on the character and viscosity of the fluid within the bottle. In the example given above for a container for use with a relatively thick creamy deodorant fluid, and in which the ball was given a radius of 0.365 inch, the outer surface of the reservoir 30 might conveniently be formed with a radius of about 0.379 inch from the center of the ball 11. Of course, when the cap 13 is in place, as in Fig. 3, the reservoir diameter is decreased slightly by the inward compressive force exerted by the cap on the upper portion of the ring 12. This reduced spacing, while small, is desirable since it enhances the capillary attraction at a time when it is not desired that fluid flow from the bottle 10 into the auxiliary reservoir 30.

Provision of the reservoir 30 allows the dispenser to be ready for immediate use when the cap 13 is removed because those portions of the ball 11 just inward of the surface 26 are kept constantly lubricated. As soon as the ball 11 is rolled a slight distance, the wet surface thereof is in contact with the surface to which the fluid is to be applied. If the reservoir 30 were not provided, and if the fluid were relatively viscous, a greater amount of rolling would have to take place before a wet portion of the ball surface came into applying position. Furthermore, the liquid seal provided in the reservoir 30 prevents drying out of the fluid adjacent the ball 11 during extended periods of idleness. Were it not for the reservoir 30 and the liquid seal provided therein, small amounts of fluid which would adhere to the ball 11 would tend to dry out and form a coating on the ball surface which might interfere with the free rotation thereof.

Referring now to Fig. 5, there is illustrated a modified construction of the annular ring 12 and the container 10. As shown in Figs. 2-4, the lug 19, together with its surface 20, is formed as an integral part of the bottle or container 10. In Fig. 5, however, a lug 31, having a bearing surface 32, is formed as an extension of the annular snap-on ring 12. The neck portion 33 of the bottle 10 is somewhat simpler in shape than the neck 15 and comprises a reduced diameter portion 34 with an outwardly extending flange 35 corresponding to the flange 16.

The ball-supporting functions of the surface 32 are identical to those of the surface 20. The remainder of

the construction may be identical to that shown and described in connection with Figs. 2-4.

The ball sealing function of the resilient bearing portion 25 with its bearing surface 26 is applicable to other ball top dispenser arrangements. For example, in dispensing relatively thick substances, such as various deodorants, lotions and the like, the substance to be dispensed may be formed in the shape of a cylindrical stick and included within a dispenser similar to those employed for lipsticks. Such a dispenser might comprise, for example as shown in Fig. 7, a generally cylindrical stationary outer container 60 having an open end adapted to accommodate a rotatable spherical ball 62. An inner container 63 is frictionally secured within the outer container 60 and the inner container is provided with an internal sleeve 64 and a cup 65 slidable relative thereto for holding the bottom of the stick 66. A thumb knob 67 or the like on the bottom of the dispenser frictionally engages a short cylindrical sleeve 68 which is secured to the internal sleeve 64 to cause the same to turn relative to the stationary outer container 60 and the inner container 63. A spiral slot 69 is provided in the inner container 63 to cooperate with a vertical slot 70 in the internal sleeve 64. A pin 71 retained in the wall of the cup 65 and extending into the spiral slot 69 in the inner container through the vertical slot 70 in the internal sleeve 64 causes the cup 65 to rise or fall within the internal sleeve 64 as the same is turned by the thumb knob 67, the direction of travel depending on the direction of turning. In this manner, the stick 66 is held against the bottom surface of the rotatable ball 62 to provide a coating of the substance to be dispensed thereon. Other well known lipstick container type mechanisms could be employed. A resilient element 72 similar to the bearing portion 25 is provided adjacent the outer end of the outer container to retain the ball 62 against outward movement. An internally tapered hollow cap 75 is provided to urge the resilient element 72 firmly into engagement with the ball 62 to seal the dispenser when not in use. The internal sleeve 64 may have an extremity of a configuration similar to that of element 15 (Fig. 4).

In a modified form of construction according to the invention, shown in Fig. 6, the reduced diameter neck portion 40 of the container or bottle 10 is provided with a recessed portion 41 and an outwardly extending flange portion 42 to accommodate corresponding portions of a clamping portion 43 of a resilient annular snap on ring 44. The ring 44 corresponds generally with the ring 12 described above in connection with Fig. 5 and is provided with a bearing portion 45 adjacent the upper end thereof. The bearing portion 45 has a bearing surface 46 adapted to be urged into firm engagement with the ball 11 when a cap 13' is in place on the bottle.

The portion of the annular ring 44 intermediate the bearing portion 45 and the clamping portion 43 is provided with a plurality of inwardly extending lugs or projections 47 corresponding to the lugs 31 of Fig. 5 and having bearing surfaces 48 located slightly above the open end of the bottle 10 for supporting the ball 11 partially within the open end of the bottle 10.

The upper portion of the bottle 10, adjacent the bottom of the neck 40, is provided with a shoulder 49 on which the bottom of the cap 13' seats. The neck 40 just above the shoulder 49 is provided with external threads 50 adapted to engage cooperating internal threads 51 provided on a downwardly extending portion 52 of the cap 13'. The inside surface of the portion 52 is tapered inwardly as shown so that, when the cap 13' is in place, the bearing surface 46 will firmly engage the ball 11 to seal the same. When the cap is removed, a slight clearance is provided between the surface 46 and the ball 11, as described hereinbefore in connection with surface 26 of Figs. 2 and 3. The annular ring 44 is provided

with a recess forming a reservoir 30' corresponding to the reservoir 30.

If desired, the lugs 47 may be replaced with a continuous projecting ring for supporting the ball 11. In this case, there will be a slight clearance between the ring surface and the ball 11 when the container is inverted so that fluid may enter the reservoir 30'. A similar arrangement could be provided for the constructions of Figs. 1-5.

While the invention has been described in specific embodiments thereof and in specific uses, it should be understood that it is not limited thereto, for obvious modifications thereof will occur to those skilled in the art without departing from the spirit and scope of the invention as set forth in the appended claims.

What is claimed is:

1. A dispensing device, comprising a container having an open end, a generally spherical ball partially within said open end whereby a portion of said ball may be contacted with the contents of said container, means for rotatably supporting said ball partially within said open end, said means comprising a bearing surface disposed within said open end and rotatably supporting said ball by contact with an inner minor portion thereof and an annular ring having a resilient annular bearing portion thereof encompassing an outer minor portion of said ball and retaining the same against movement outwardly of said open end, said ring being provided with a cammable surface on an exterior face of said resilient annular bearing portion and a clamping portion, said clamping portion firmly engaging said container adjacent said open end thereof, and a removable hollow cap having a camming surface engaging said cammable surface of said annular ring and urging said bearing portion into sealing engagement with said ball.

2. A dispensing device, comprising a container having an open end, a generally spherical ball partially within said open end whereby a portion of said ball may be contacted with the contents of said container, means for rotatably supporting said ball partially within said open end, said means comprising an annular ring having a relatively resilient narrow circular bearing portion thereof encompassing an outer portion of said ball and retaining the same against movement outwardly of said open end, said bearing portion having a cammable surface on an exterior face thereof, and a clamping portion, said clamping portion firmly engaging said container adjacent said open end thereof, and a hollow cap relatively stiff compared to said bearing portion having one end thereof encompassing the bearing portion of said annular ring, said one end of said cap having a radially inwardly tapered inner surface engaging said cammable surface and urging said bearing portion firmly into sealing engagement with said ball thereby to seal said device against leakage of said contents past said ball when said cap is engaged with said bearing portion.

3. As an article of manufacture a fluid containing and dispensing device, comprising a container having an open end, a supply of fluid within said container, a generally spherical ball partially within said open end and having a portion thereof in contact with the fluid contents of said container, means rotatably supporting said ball partially within said open end, said means comprising a plurality of spaced projections integrally formed with said container and providing a plurality of spaced bearing surfaces disposed within said open end and rotatably supporting said ball and an annular ring having a relatively resilient circular bearing portion thereof encompassing an outer circular portion of said ball and retaining the same against movement outwardly of said open end and a clamping portion thereof firmly engaging said container adjacent said open end thereof, said bearing portion of said annular ring being provided with a peripheral surface, and a removable hollow cap relatively stiff com-

pared to said bearing portion having one end thereof encompassing the bearing portion of said annular ring, said one end of said cap having an internal radially inward taper engaging said peripheral surface of said bearing portion and urging said bearing portion firmly into sealing engagement with said ball thereby to seal said container against leakage of said fluid contents past said ball when said cap is engaged with said bearing portion.

4. As an article of manufacture a deodorant containing and dispensing device, comprising a container having an open end, a supply of deodorant within said container, a generally spherical ball partially within said open end and having a portion thereof in contact with the contents in said container, means for rotatably supporting said ball partially within said open end, said means comprising an annular ring having a plurality of spaced projections providing a plurality of spaced bearing surfaces disposed within said open end and rotatably supporting said ball, a relatively resilient bearing portion of said ring encompassing a circular portion of said ball outwardly of said open end and retaining the ball against movement outwardly of said open end, a clamping portion on said ring firmly engaging said container adjacent said open end thereof, a peripherally extending cammable surface on said ring adjacent the bearing portion thereof, and a hollow cap for attachment to said container and for contacting said cammable surface, said cap being relatively stiff compared to said bearing portion having one end thereof encompassing the bearing portion of said annular ring, said one end of said cap having an internal diameter less than the external diameter of said peripheral cammable surface at the area of contact therewith and urging said bearing portion firmly into sealing engagement with said ball thereby to seal said container against leakage of said contents past said ball when said cap is engaged with said bearing portion.

5. A dispensing device, comprising a container having an open end, a generally spherical ball partially within said open end and having a portion thereof in contact with the contents of said container, means for rotatably supporting said ball partially within said open end, said means comprising a plurality of spaced bearing surfaces disposed within said open end and rotatably supporting said ball and an annular ring having a relatively resilient bearing portion thereof encompassing an outer portion of said ball and retaining the same against movement outwardly of said open end and a clamping portion thereof firmly engaging said container adjacent said open end thereof, said bearing portion being provided with external threads having a given root diameter, and a relatively stiff removable hollow cap having the mouth end thereof provided with internal threads adapted to engage said external threads, the root diameter of said internal threads remote from said mouth end of said cap being smaller than said given root diameter whereby threaded engagement of said cap and said bearing portion urges said bearing portion firmly into sealing engagement with said ball thereby to seal said container against leakage of said contents past said ball when said cap is engaged with said bearing portion.

6. As an article of manufacture a fluid deodorant containing and dispensing device, comprising a container having an open end, a supply of fluid deodorant within said container, a generally spherical ball partially within said open end and having a portion thereof in contact with the fluid deodorant in said container, means for rotatably supporting said ball partially within said open end, said means comprising a plurality of spaced bearing surfaces disposed within said open end and rotatably supporting said ball and an annular ring having a relatively resilient bearing portion thereof provided with a circular bearing surface encompassing an outer portion of said ball and retaining the same against movement outwardly of said open end and a clamping portion thereof

firmly engaging said container adjacent said open end thereof, said annular ring having a portion of the inner surface thereof disposed between the bearing surface of said bearing portion and the open end of said container having an inner diameter larger than that of said bearing portion and larger than the diameter of the adjacent surface of said ball and forming a reservoir with the latter, the spacing of said portion of the inner surface of said annular ring and the adjacent surface of said ball being sufficiently small that the fluid deodorant within said reservoir is retained in lubricating contact with said ball by capillary attraction when said device is not in use, and a hollow cap relatively stiff compared to said bearing portion encompassing the bearing portion of said annular ring, said cap having an internal surface tapering radially inward toward the top of said cap to a smaller diameter than the external diameter of said bearing portion, said internal surface engaging said bearing portion and urging the bearing surface of said bearing portion firmly into sealing engagement with said ball thereby to seal said container against leakage of said fluid deodorant past said ball when said cap is engaged with said bearing portion.

7. A fluid dispensing device, comprising a container having an open end, a generally spherical ball partially within said open end whereby a portion of said ball may be contacted with the fluid in said container, means rotatably supporting said ball partially within said open end, said means comprising a plurality of spaced bearing surfaces disposed within said open end and rotatably supporting said ball and an annular ring having a relatively resilient circular bearing portion thereof provided with a circular bearing surface encompassing an outer portion of said ball and retaining the same against movement outwardly of said open end and a clamping portion thereof firmly engaging said container adjacent said open end thereof, said annular ring having a portion of the inner surface thereof disposed between the bearing surface of said bearing portion and said container having an inner diameter larger than that of said circular bearing surface and the diameter of the adjacent surface of said ball and forming a reservoir with the latter, the spacing of said portion of the inner surface of said annular ring and the adjacent surface of said ball being sufficiently small that the fluid within said reservoir is retained in lubricating contact with said ball by capillary attraction when said device is not in use, said bearing portion being provided with external threads having a given root diameter, and a removable hollow cap relatively stiff compared to said bearing portion having its internal surface provided with internal threads threadedly engageable with said external threads, the root diameter of said internal threads remote from the open end of said cap being smaller than said given root diameter, the arrangement being such that threaded engagement of said cap and said external threads of said bearing portion will serve to urge the bearing surface of said bearing portion firmly into sealing engagement with said ball thereby to seal said container against leakage of said fluid past said ball when said cap is engaged with said bearing portion.

8. In a ball top fluid dispenser having an open-ended container, a ball applicator rotatably mounted adjacent the open end of the container and a hollow cap having a tapered bore decreasing in diameter with distance from the open end of the cap, means for retaining said ball applicator against movement outwardly of the open end of said container and for sealing said dispenser against loss of fluid by leakage and evaporation when not in use comprising a resilient annular ring having a first portion thereof arranged for quick detachable engagement with said container adjacent the open end thereof, said annular ring having a second portion including a resilient bearing surface for loosely encompassing an outer portion of said ball when said dispenser is in use and a cammable

surface engageable with the tapered bore of said cap, engagement of said cammable surface by said tapered bore of said cap urging said bearing surface firmly into sealing engagement with said ball to seal said dispenser.

9. In a ball top fluid dispenser having a container, a ball applicator rotatably mounted partially within an open end of the container and an internally threaded removable hollow cap, the root diameter of the internal threads of said cap progressively decreasing with distance from the mouth of the cap, means for retaining said ball applicator against movement outwardly of the open end of said container and for sealing said dispenser against loss of fluid by leakage and evaporation when not in use comprising a resilient annular ring having a first portion thereof adapted for quick detachable engagement with said container adjacent the open end thereof, said annular ring having a second portion including a bearing surface for loosely encompassing an outer portion of said ball when said dispenser is in use and an exterior portion having threads of a constant root diameter corresponding to the largest root diameter of the internal threads of said cap and adapted for engagement therewith, engagement of the threaded portion of said ring with the threads of said cap urging said bearing surface firmly into sealing engagement with said ball to seal said dispenser upon tightening of the cap.

10. A fluid dispensing device, comprising a container having an open end, a generally spherical ball partially within said open end and having a portion thereof in contact with the fluid in said container, means for rotatably supporting said ball partially within said open end, said means comprising an annular ring having a relatively resilient bearing portion thereof encompassing an outer portion of said ball to retain the same against movement of said open end and a clamping portion firmly engaging said container adjacent said open end thereof, and a relatively stiff removable hollow cap engageable with said container adjacent the open end thereof and with the bearing portion of said annular ring, said bearing portion and said cap having co-operating surfaces arranged to impart a camming action to said bearing portion upon application of said cap to said container to urge said bearing portion firmly into sealing engagement with said ball thereby to seal said container against leakage and evaporation of said fluid past said ball when said cap is engaged with said bearing portion.

11. A fluid dispensing device, comprising a container having an open end, said container being provided with external threads adjacent said open end thereof, a generally spherical ball adapted to fit partially within said open end whereby a portion of said ball may be contacted with the fluid in said container, means for rotatably supporting said ball partially within said open end, said means comprising an annular ring having a relatively resilient circular first bearing portion for encompassing an outer portion of said ball to retain the same against movement outwardly of said open end, peripheral cammable surfaces on said bearing portion, a clamping portion thereof for firmly engaging said container adjacent said open end and a second bearing portion encompassing an inner portion of said ball for supporting said ball and retaining the same against movement inwardly of said open end, and a removable hollow cap relatively stiff compared to said first bearing portion and having internal threads for engaging said external threads, said cap having an internal tapered surface for engagement with the cammable surfaces of said annular ring and urging said first bearing portion firmly into sealing engagement with said ball thereby to seal said container against leakage and evaporation of said fluid past said ball when said cap is engaged with said first bearing portion.

12. A dispensing device comprising a container having an open end, a generally spherical ball positioned at said

open end, an inner portion of said ball being in contact with the contents of said container, means for rotatably supporting said ball at said open end comprising bearing surfaces on said open end of said container for contact with an inner minor portion of said ball, means for retaining said ball against movement outwardly from said open end and for sealing said container comprising an annular member having a resilient annular bearing portion encompassing an outer minor portion of said ball, said member having a clamping portion firmly engaging said container adjacent said open end, said resilient bearing portion being adapted for radial inward deformation to seal said container by sealing contact between said bearing portion and said outer minor portion of said ball upon application of an external force directed radially and inwardly against said bearing portion, and means connectable with said container, said means and said member being provided with co-operating surfaces arranged to impart said radial inward deformation to said bearing portion when said means is firmly connected thereto.

13. A dispensing device comprising a container having an open end, a generally spherical ball at said open end and having an inner portion thereof in contact with the contents of said container, means for rotatably supporting said ball at said open end comprising bearing surfaces carried by said open end of said container for contact with an inner minor portion of said ball, means for retaining said ball against movement outwardly from said open end comprising an annular member having a resilient annular bearing portion encompassing an outer minor portion of said ball, and a clamping portion firmly engaging said container adjacent said open end, said resilient bearing portion being adapted for radial inward deformation, and means for sealing said container comprising a cap for attachment to said container, said cap and said member being provided with co-operating surfaces arranged to impart a camming action to said bearing portion to effect said inward radial deformation thereof upon firm application of said cap.

14. A dispensing device comprising a container having an open end, a spherical ball adjacent said open end, means carried by said container for rotatably and non-resiliently supporting said ball about an inner minor portion thereof, an annular member secured to said open end about said ball and retaining the same against movement outwardly of said open end, said member having a resilient bearing portion which, in a dispensing position, is slightly spaced radially from an outer minor portion of said ball, said bearing portion being adapted for radial inward deformation into sealing contact with said outer minor portion of said ball to seal said container, and means connectable with said container and having a circumferentially extending surface constructed and arranged to engage said bearing portion to deform all portions of the same radially inward into contact with said outer minor portion of said ball to effect said sealing contact.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 2,749,566

June 12, 1956

Ralph Henry Thomas

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 3, line 62, for "portions" read -- portion --; column 4, line 29, after "should" insert -- not --; column 9, line 35, after "movement" insert -- outwardly --.

Signed and sealed this 14th day of August 1956.

(SEAL)

Attest:

KARL H. AXLINE

Attesting Officer

ROBERT C. WATSON
Commissioner of Patents