Feb. 18, 1958 R. H. WHITNEY 2,823,403

BALL AND SOCKET PLASTIC FITMENT

Filed April 23, 1956

Fig 1

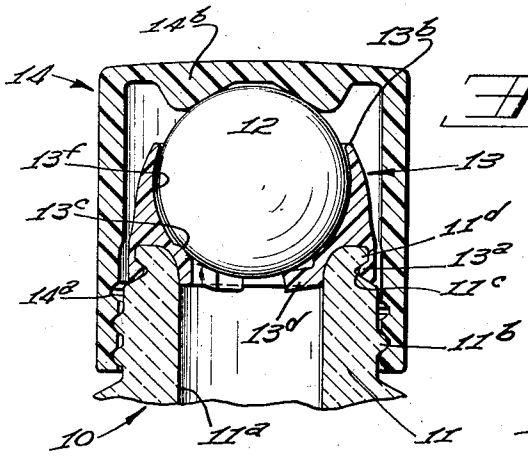


Fig 2

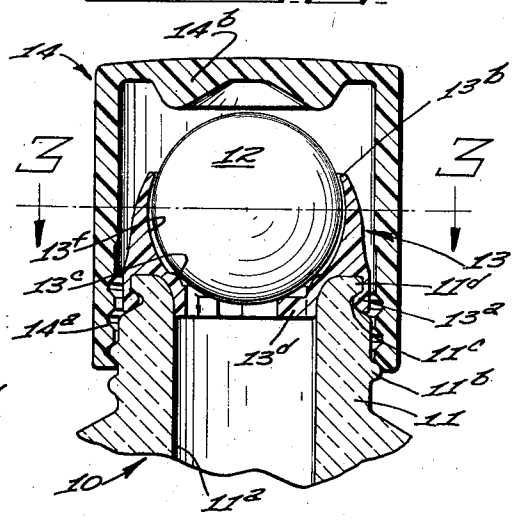


Fig 3

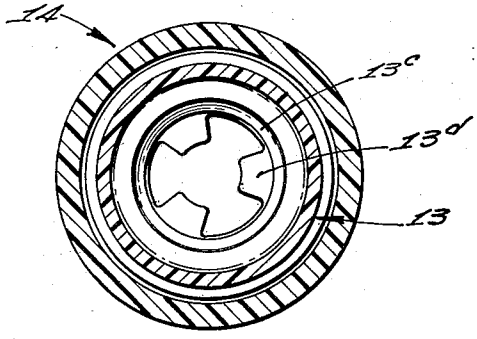
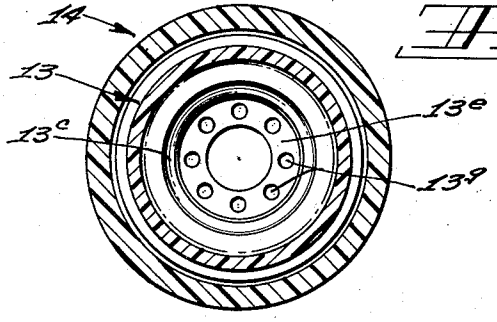


Fig 4



INVENTOR
RALPH H. WHITNEY
BY
W. A. Schaich
Leonard O. Foutin
ATTORNEYS

United States Patent Office

2,823,403

Patented Feb. 18, 1958

2,823,403

BALL AND SOCKET PLASTIC FITMENT

Ralph H. Whitney, Toledo, Ohio, assignor to Owens-Illinois Glass Company, a corporation of Ohio

Application April 23, 1956, Serial No. 580,018

9 Claims. (Cl. 15—132.7)

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

An object of this invention is the provision of a simple, economically manufacturable ball retainer element which uniquely cooperates with the dispensing ball to retain it in assembly on a container and to provide a seal against leakage of the container contents when the applicator is not in use.

A particular object of this invention is to provide an improved combination of dispensing ball, ball retainer and closure for a deodorant container, or the like, wherein the closure cooperates with the ball to produce a seal between the ball and the retainer when the closure is tightened, and wherein the retainer cooperates with the ball to retain it in assembly when the closure is removed and permit a ball-adhering layer of deodorant, cosmetic or the like, to be applied to the body surface by rolling movement of the ball along such surface.

The specific nature of this invention, as well as other objects and advantages thereof, will become apparent to those skilled in the art from the following detailed description, taken in conjunction with the annexed sheet of drawings, on which, by way of preferred example only, are illustrated two embodiments of this invention.

Figure 1 is a vertical sectional view of a neck portion of a container in which the improved ball retaining fitment and closure of this invention are assembled in closed, sealing relationship.

Figure 2 is a view similar to Figure 1 but illustrating the relative position of the ball, ball retaining fitment and closure when the closure is partially removed from the container.

Figure 3 is a sectional view taken on the plane 3—3 of Figure 2, with the ball omitted for clarity of illustration.

Figure 4 is a view similar to Figure 3, but illustrating a modified form of the ball retaining fitment embodying this invention.

As shown on the drawings:

Numeral **10** represents a container for deodorants, perfume, or similar cosmetic compositions that are commonly applied directly to the body. Container **10** has a cylindrical neck portion **11** defining an opening **11***a*. Threads **11***b* are formed on the lower portion of neck **11**, and a groove **11***c* with an outer retaining shoulder **11***d* is defined adjacent the end of neck **11**. A ball **12** of glass, plastic, or other suitable material, is provided. An annular ball retaining fitment **13** is provided for mounting the ball **12** in dispensing relationship with respect to the neck opening **11***a*. Fitment **13** is preferably formed of an elastic material, such as rubber or polyethylene, and has its one axial end shaped to snugly engage the end of neck **11** and to be retained therein by having an internally projecting rib **13***a* engageable in snap fit relationship in the groove **11***c*. The other end of fitment **13***b* is of circular configuration and of smaller diameter than

the diameter of the ball **12**. Intermediate these two ends, fitment **13** defines a spheroidal ball pocket **13***f*, into which the ball **12** may be inserted by distending the outer end **13***b* of fitment **13**. At the lower end of the ball pocket **13***f*, an annular sealing surface **13***c* is provided which, when ball **12** is pressed thereagainst, will function to prevent any flow of contents of the container **10** outwardly between the ball **12** and fitment **13**. Additionally, sealing ring 13c is preferably loacted in overlying relationship to the internal corner **11***d* of the end of neck portion **11** so that the same pressure on ball **12** which produces a seal between the ball **12** and fitment **13** will contribute to the maintenance of the fluidtight seal between fitment **13** and neck portion **11***d*.

Additionally, the bottom portion of fitment **13** (as viewed in the drawings) is provided with at least one internally projecting lug **13***d*. In the modification illustrated in Figures 1–3 of the drawings, three such lugs **13***d* are provided. In an alternative construction illustrated in Figure 4, the function of the lug **13***d* is performed by an equivalent flexible annular rib or web **13***e*, which is provided with a plurality of spaced apertures **13***g*. In both modifications of this invention, the lugs **13***d* or the annular rib **13***e*, as the case may be, are so proportioned relative to the ball **12** and the annular sealing surface **13***c* as to normally maintain the ball **12** in a spaced, elevated position with respect to the annular sealing surface **13***c*, as illustrated in Figure 2. This is the normal operating position of the ball **12** relative to retaining fitment **13**, and it will be observed that a substantial portion of the surface of the ball is exposed to the contents of container **10** when such container is inverted, and a surface layer of such contents can be carried to the skin or clothing of the user by rolling the ball **12** along the skin or clothing area.

A closure **14** of customary inverted cup shaped configuration is provided having internal threads **14***a* cooperable with the neck threads **11***b* of the container **10**. Additionally, the head portion **14***b* of closure **14** is shaped to engage the top surface of ball **12** as the closure **14** is tightened on neck threads **11***b* and thus operate to force ball **12** downwardly, as viewed in the drawings, resiliently depressing the lugs **13***d* or the annular rib **13***e*, as the case may be, and bringing the ball **12** into sealing engagement with the annular sealing surface **13***c*. In this manner, a completely effective seal is produced between the container neck portion **11**, fitment **13**, and ball **12**, and no leakage of the contents of the container **10** will be experienced until the closure **14** is loosened or removed. When this occurs, the flexibility and resilience of the depressed lugs **13***d*, or annular rib **13***e*, as the case may be, again raises the ball **12** to its dispensing position illustrated in Figure 2.

A particular advantage of the aforedescribed construction is the fact that a maximum quantity of the contents of container **10** will be dispensed with a relatively light pressure of the ball **12** against the skin. In fact, the application of a heavy pressure to ball **12** will bring the ball **12** into contact with annular sealing surface **13***c* and tend to scrape off the cosmetic substance and prevent its passage to the exposed surface of the ball.

From the foregoing description, it will be apparent that this invention provides an unusually simple, yet effective, ball-type applicator assemblage for perfume, deodorant, and similar cosmetic containers.

It will, of course, be understood that various details of construction may be modified through a wide range without departing from the principles of this invention, and it is therefore not the purpose to limit the patent granted hereon otherwise than necessitated by the scope of the appended claims.

I claim:

1. A dispensing package comprising a container having a neck defining a dispensing opening, said neck having an external threaded portion and a retaining shoulder axially outward of said threaded portion, an annular ball support of flexible plastic material, one end of said ball support defining an internally projecting rib cooperable with said retaining shoulder to mount said ball support on the end of said neck, said ball support defining an annular ball seat located in spaced relation to said one end, a ball insertable in said ball-support and adapted to engage said ball seat in sealing relation, said ball support having at least one internally projecting lug disposed between said ball seat and said one end and engageable with said ball to support said ball in an elevated and unsealed position relative to said ball seat, a closure constructed to surround said ball support and threadably engage said threaded neck portion, and means on said closure for forcing said ball into engagement with said ball seat to seal said container, thereby resiliently deforming said lug, as said closure is tightened.

2. The combination defined in claim 1 wherein said ball seat overlies the annular interior edge of said dispensing opening whereby pressure of said ball promotes the sealing of said ball support with said neck.

3. A ball type applicator fitment for a container having a threaded neck defining an opening, comprising an annular ball support of flexible plastic material, means on one axial end of said support snugly engageable with said neck to mount said ball support in coaxial relation to said opening, said ball support defining an annular ball seat located in spaced relation to said one end, a ball insertable in said ball-support and adapted to engage said ball seat in sealing relation, said ball support having at least one internally projecting lug disposed between said ball seat and said one end and engageable with said ball to support said ball in an elevated and unsealed position relative to said ball seat, a closure constructed to surround said ball support and threadably engage said threaded neck, and means on said closure for forcing said ball into engagement with said ball seat to seal said container, thereby resiliently deforming said lug, as said closure is tightened.

4. In a container having a dispensing opening, an annular ball support of elastomeric material on said container in sealing engagement therewith having an axial bore concentric with said opening, said support having at least one radially inwardly projecting lug and a radially inwardly projecting annular lip axially spaced from said lug away from said opening, a ball interposed between said lug and said lip, the ball periphery being engageable with the lug and the lip to axially confine the ball in alignment with said opening, an annular sealing surface of a diameter less than the diameter of the ball and interposed between the ball and the container, the engagement of said ball with said lug normally retaining the ball off said sealing surface, and closure, and closure means for said container contactable with said ball to urge said ball toward said sealing surface, the urging of the ball deflecting the elastomeric lug to accommodate movement of the ball into engagement with the sealing surface.

5. In a container having a dispensing opening, a resiliently flexible annular support on the container having one open end communicating with said opening and another end spaced therefrom, a ball disposed medially of said support and entrapped therein between an annular lip of less diameter than the ball at said another end and a radially inwardly projecting, readily deflectible support surface adjacent said one end, means defining an annular seat adjacent said one end and normally spaced from the ball periphery by contact of said ball with said support surface, and closure means removably engageable with said container in surrounding relation with said flexible support and having a ball-engaging surface for forcing the ball against said seat by forcibly deflecting said support surface.

6. In a container having a dispensing opening defined by a peripheral shoulder inclined generally outwardly relative to the opening, a resiliently flexible fitment secured to the container and having a generally outwardly directed radially enlarged shoulder contacting said peripheral shoulder of said container, an inwardly projecting annular sealing shoulder on said fitment generally radially aligned with said outwardly directed fitment shoulder, a ball confined by said fitment and of larger diameter than said inwardly projecting shoulder, and closure means for said container engageable with said ball to urge the same toward said opening and into sealing engagement with said inwardly projecting shoulder, the engagement of said ball with said inwardly projecting shoulder tending to expand the fitment radially outwardly to urge the outer shoulder into snugly wedged sealing engagement with the container shoulder.

7. In combination, a rigid container having a dispensing opening defined by a neck having an axial bore, a radially outwardly directed terminal face, and a tapered annular shoulder joining said face and said bore; a fitment for said container engaging said neck, said fitment being formed of resilient material and having an interior annular seating surface and an exterior tapered shoulder in conforming contact with said container shoulder; a ball confined by said fitment for engagement with said seating surface; and a closure cap for said container, said cap urging said ball against said seating surface and forcing said outer shoulder thereof into wedged engagement with said container shoulder, whereby said cap both seals said ball to said fitment and seals the fitment to the container.

8. An applicator for use with a rigid container having a dispensing opening defined by a neck having an axial bore, a radially outwardly directed terminal face, and an inclined shoulder joining said face and said bore; said applicator comprising a fitment for engagement with said container, said fitment being formed of resiliently deformable material and having an end portion insertable into said neck, said fitment having an interior annular seating surface alignable with said container shoulder and aligned with an outer fitment shoulder for conforming contact with said container shoulder, a ball confined by said fitment for engagement with said seating surface, and a closure cap for said container, said cap urging said ball against said seating surface and being effective to deform the deformable fitment outer shoulder into wedged engagement with said container shoulder.

9. For use with a container having a dispensing opening, an applicator assembly comprising a resiliently flexible support adapted to be secured to the container and having an annular generally radially outwardly directed shoulder adapted to contact said container adjacent the opening, an inwardly projecting annular sealing shoulder on said support, a ball confined by said support and of larger diameter than said inwardly projecting shoulder, and closure means for said container for urging said ball into engagement with said inwardly projecting shoulder, such engagement of said ball with said inwardly projecting shoulder sealing the ball thereto and applying a compressive force to those portions of said support between said shoulders to urge the outer shoulder into snug sealing engagement with the container.

References Cited in the file of this patent

UNITED STATES PATENTS

1,362,431	Machles	Dec. 14, 1920
1,977,414	Testa	Oct. 16, 1934
2,700,784	De Brock	Feb. 1, 1955
2,749,566	Thomas	June 12, 1956

U. S. DEPARTMENT OF COMMERCE

PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 2,823,403 February 18, 1958

Ralph H. Whitney

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 1, line 63, after "mounting" strike out the hyphen; column 2, line 9, for "loacted" read -- located --; column 3, line 57, strike out "and closure,".

Signed and sealed this 15th day of April 1958.

(SEAL)
Attest:

KARL H. AXLINE
Attesting Officer

ROBERT C. WATSON
Commissioner of Patents