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S. SUDBEAZ

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COMBINATION BOTTLE CLOSURE AND BALL APPLICATOR

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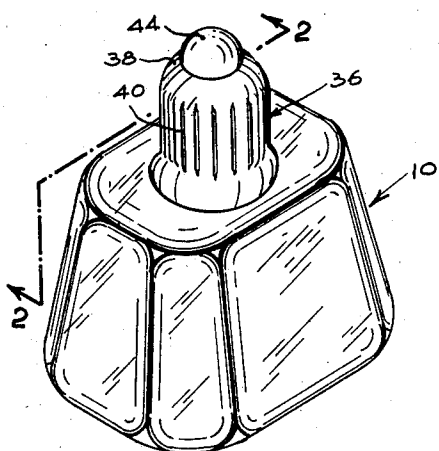


FIG. 1.

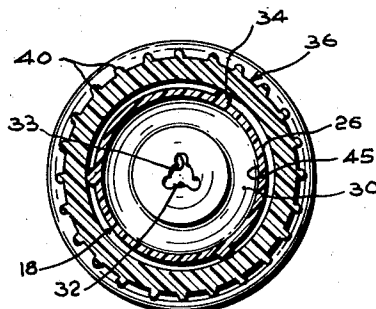


FIG. 4.

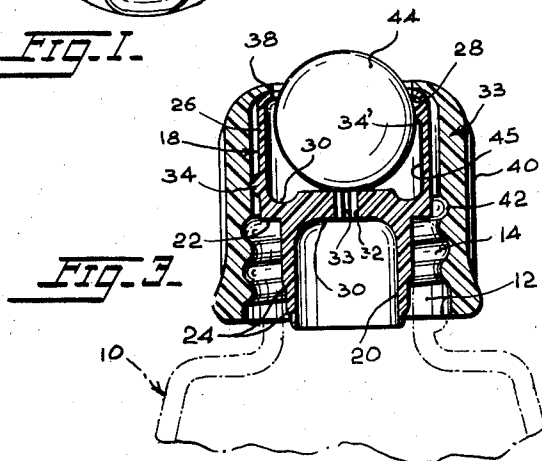


FIG. 3.

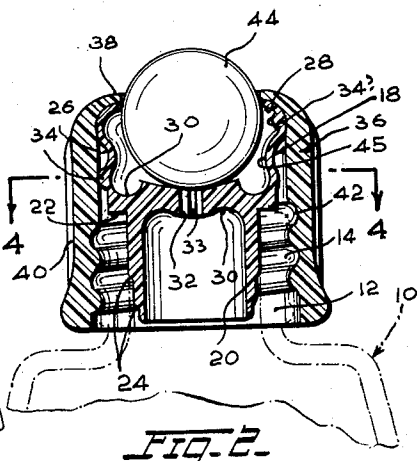


FIG. 2.

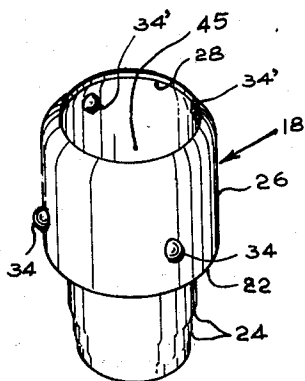


FIG. 5.

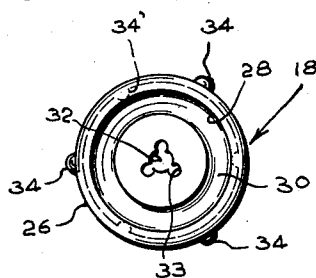


FIG. 6.

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## COMBINATION BOTTLE CLOSURE AND BALL APPLICATOR

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11 Claims. (Cl. 15—132.7)

This invention relates to combination closure caps and dispensers for liquids, and more particularly has reference to a combined cap and dispenser or applicator especially, though not necessarily, adapted to provide a closure and dispenser or applicator for a perfume bottle.

The present invention constitutes an improvement over the device shown in U. S. Patent No. 2,641,788, issued to me on June 16, 1953.

In the mentioned patent, there is shown a combined cap and dispenser or applicator, including a ball element so arranged as to be rotatable in the cap, in such a manner as to permit liquid adhering to the ball to be transferred and applied to the skin of the person using the perfume, or to some other surface to which the perfume is to be applied.

In accordance with the present invention, there is provided a generally improved combined cap and dispenser or applicator for a perfume bottle including a reservoir and a rotatable ball element sealing said reservoir and the contents of the bottle in one and the same operation and vice versa, by turning the cap alone, and wherein the liquid may be applied upwardly or in any direction, the device constituting the present invention being so constructed as to be capable of manufacture at low cost, while providing a generally improved dispensing and applying action.

A further object of importance is to construct the closure cap in such a manner as to permit the perfume bottle to be tightly sealed, responsive to threading of the cap body in a direction toward the bottle, in a manner such as to cause said body to press the ball element preventing rotation thereof, with the ball element in turning pressing against a partition formed of a somewhat flexible plastic, in which partition a dispensing opening is formed, with the ball element closing said opening when the cap body is turned in the direction mentioned.

Another object of importance is to provide an improved closure cap and dispenser or applicator for perfume bottles wherein the cap body, when threaded upon the neck of the bottle, will also be engaged with the ball retainer outlet end causing radial distortion in such a manner as to force said ball retainer into a tight, sealing engagement with the bottle whenever the cap body is adjusted to a position binding the ball element against rotation.

Another object is to so form the device as to cause the ball element to be completely free for rotational movement responsive to a minimum amount of adjustment of the cap body in a direction away from the bottle, while the ball element is in steady set position, thus to swiftly and easily prepare the device for pouring liquid onto the ball element for dispensing of the perfume, and to adjust the flow of the contents to the desired amount.

Another object is to provide lugs on the inner surface of the retainer so as to suspend the ball and provide ample clearance between said parts to permit the

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contents of the bottle to pour out generously upon upending of the bottle, when the bottle contains a liquid.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is a perspective view of a perfume bottle equipped with a combined closure cap and dispensing means formed according to the present invention.

Fig. 2 is an enlarged sectional view on line 2—2 of Fig. 1 in which the cap body has been adjusted to a bottle-sealing position.

Fig. 3 is a view similar to Fig. 2 but showing the cap body in bottle opening condition.

Fig. 4 is a cross-sectional view taken on the plane of the line 4—4 of Fig. 2.

Fig. 5 is a perspective view of the ball retainer per se.

Fig. 6 is a top plan view of the ball retainer per se.

In the form of the invention shown in Figs. 1—6, the perfume bottle has been generally designated 10, and is preferably formed of glass or rigid plastic material and includes a neck 12 formed with coarse external threads 14.

A ball retainer has been generally designated 18, and is molded of a somewhat flexible plastic material, such as polyethylene. This characteristic of the ball retainer, wherein it has a limited but distinct flexibility, is of importance in the invention, as will presently appear.

The ball retainer 18 includes a depending, cylindrical skirt 20, externally formed adjacent its upper end with a downwardly facing shoulder 22 adapted to bear against the upper end of the neck 12. Below the shoulder 22, skirt 20 has a cylindrical outer surface frictionally binding against the inner surface of neck 12, with the skirt being formed at its lower end with steps 24, to facilitate the insertion of the skirt in the bottle, said steps serving to not only progressively reduce the outer diameter of the skirt in the direction of the lower extremity thereof, but also serving to progressively reduce the thickness of the skirt, so as to impart maximum flexibility thereto at the lower end, to aid in the insertion of the skirt within the neck 12.

The upper end portion of the ball retainer is cupped and formed as a ball seat 26 externally tapered along curving lines as shown to particular advantage in Figs. 2, 3 and 5. The ball seat 26, at its upper end, has a circumferential, inwardly directed lip 28, and at the juncture of the ball seat with skirt 20, there is integrally formed in the ball retainer a transverse partition 30 centrally formed with a dispensing opening 32. The opening 32, as shown in Figs. 4 and 6, is formed with radial notches 33 angularly spaced one hundred and twenty degrees apart about the circumference of the opening, to prevent the ball interfering with the flow of the contents of the bottle into the reservoir, the ball when seated having a tendency to close the passage of liquid from the bottle.

Integrally formed upon the outer surface of the ball seat 26 are rounded lugs 34, projecting radially from the ball retainer. Lugs 34 are angularly spaced one hundred and twenty or ninety degrees apart about the circumference of the ball retainer as shown in Fig. 6. The lugs 34 lie between the neck threads 14 and the cap body 36 and by reason of the protrusion of the lugs, a tight fit is provided, thereby eliminating any looseness between the cap and bottle threads, and thus stabilize the cap the desired distance from the bottle which in

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turn provides the means for controlling the desired amount of flow from the dispenser.

Similarly constructed and arranged lugs 34', but smaller, may be provided on the inner surface of the ball seat to effect a free flow of the contents into a receptacle, as later described.

Cap body 36 is molded of plastic and is of rigid formation, said cap body being flared in a downward direction as shown in Figs. 2 and 3. The cap body is formed open at its opposite ends, and at its upper end has an inwardly directed flange 38. Formed upon the outer surface of the cap body are closely spaced ribs 40, disposed about the full circumference of the cap body as shown in Fig. 1 and extending longitudinally of the same, for the purpose of providing a roughened surface on the body that facilitates rotation of the same in opposite directions by a user.

Formed on the inner surface of the cap body are coarse, internal spiral grooves 42, complementing the threads 14 of neck 12.

Seated in the ball seat 26 is a ball 44, the ball seat extending above the center point of the ball to retain the same and provide a reservoir 45 for perfume discharged through outlet 32. The lip 28 ordinarily is spaced away from the surface of the ball a distance, when the cap is set for dispensing, which distance, though minute, is still ample to permit liquid adhering to the surface of the ball 44 to move past the lip into an area in which said liquid will be applied to the skin of a user, or to some other surface on which the perfume is to be used.

In use, the ball retainer 18 with the ball 44 therein is plugged into the neck 12 of the bottle in the manner previously described. The cap body 36 is then threaded onto the neck 12 and during this operation frictionally engages the lugs 34 and the upper outer wall of the ball retainer and presses the lip 28 of the ball retainer against the ball 44 and simultaneously pressing the ball 44 inwardly to its seat on the partition 30 over the outlet 32. The ball deforms the ball seat 26 and flexes the partition to the Fig. 2 position, providing a slightly concaved, ball-contacting surface upon the partition in the area of the opening 32, the inherent flexibility, softness and resiliency of the sealing material such as polyethylene allowing this flexure. As a result, the outlet opening 32 and the reservoir 45 are fully closed by the ball 44 at this time.

When the perfume is to be dispensed, the cap body is loosened or threaded upwardly to the position of Fig. 3, that is, in a direction away from the body portion of the bottle 10. This releases the pressure of the flange 38 on the lip 28 and on ball 44, creates a clearance between the lip 28 and ball due to the resiliency of the material used, and releases pressure of ball 44 on opening 32, permitting the ball to rotate freely in the ball retainer. Further, the ball is no longer pressed tightly against the partition 30, so that liquid will flow through opening 32, on inversion of the bottle, into the interior of the ball seat 26 and against the surface of the ball, the inner lugs 34' serving to suspend the ball 44 upon inversion thus providing a space around the ball if it is desired to pour out the contents. The interior of the ball seat 26 serves as the reservoir 45 for a small supply of perfume. With the bottle inverted, the ball is held against the skin and by moving the bottle along the skin, the ball will be caused to rotate, so that the liquid-coated areas of the surface thereof will move into contact with the skin, to transfer the liquid to the skin. By reason of the reservoir 45, the liquid can be applied upwardly in a vertical position of the bottle, after the reservoir has been filled, by tilting the fluid in said reservoir.

The improved device is particularly adapted to provide an effective seal when the perfume is not in use, preventing evaporation of the perfume. Further, the device can be manufactured at relatively low cost, primarily due to

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the adjustability of the sealing elements of this invention to a large range of tolerance variation of the ball diameter, while still providing an effective dispensing action wherein there is a controlled transfer of the perfume to the skin from the bottle, with the application of the perfume being limited exactly to the particular areas of one's skin to which the user desires to apply the perfume.

While I have illustrated and described the preferred embodiment of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and that various changes and modifications may be made within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

1. A combined cap and dispenser for a perfume bottle having an externally threaded neck, comprising a flexible ball retainer engageable in said neck and having a cupped portion formed at its bottom with a dispensing opening and at its top with an inwardly extending lip, a tubular cap body threaded for engagement with the threads of the neck and enclosing the ball retainer, and a ball rotatably seated in said cupped portion and projecting out of the cap body for applying the contents of the bottle responsive to rolling of the ball upon a selected surface, said cap body including an inwardly directed circumferential flange disposed to press against the lip whereby the ball is pressed upon threading of the cap body onto the neck to a predetermined extent, said ball when pressed by the lip being held against rotation in the cupped portion in position to seal the dispensing opening.

2. A combined cap and dispenser for a perfume bottle having an externally threaded neck, comprising a flexible ball retainer engageable in said neck and having a cupped portion formed at its bottom with a dispensing opening and at its top with an inwardly extending lip, a tubular cap body threaded for engagement with the threads of the neck and enclosing the ball retainer, and a ball rotatably seated in said cupped portion and projecting out of the cap body for applying the contents of the bottle responsive to rolling of the ball upon a selected surface, said cap body including an inwardly directed circumferential flange disposed to press against the lip whereby the ball is pressed upon threading of the cap body onto the neck to a predetermined extent, said ball when pressed by the lip being held against rotation in the cupped portion in position to seal the dispensing opening, the ball retainer including a skirt depending from the cupped portion and comprising the part of the ball retainer engageable in the neck.

3. A combined cap and dispenser for a perfume bottle having an externally threaded neck, comprising a flexible ball retainer engageable in said neck and having a cupped portion formed at its bottom with a dispensing opening and at its top with an inwardly extending lip, a tubular cap body threaded for engagement with the threads of the neck and enclosing the ball retainer, and a ball rotatably seated in said cupped portion and projecting out of the cap body for applying the contents of the bottle responsive to rolling of the ball upon a selected surface, said cap body including an inwardly directed circumferential flange disposed to press against the lip whereby the ball is pressed upon threading of the cap body onto the neck to a predetermined extent, said ball when pressed by the lip being held against rotation in the cupped portion in position to seal the dispensing opening, the ball retainer including a skirt depending from the cupped portion and comprising the part of the ball retainer engageable in the neck, said ball retainer being formed with a downwardly facing, circumferential shoulder adapted to bear against the outer end of the neck on engagement of the ball retainer in the neck.

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4. A combined cap and dispenser for a perfume bottle having an externally threaded neck, comprising a flexible ball retainer engageable in said neck and having a cupped portion formed at its bottom with a dispensing opening and at its top with an inwardly extending lip, a tubular cap body threaded for engagement with the threads of the neck and enclosing the ball retainer, and a ball rotatably seated in said cupped portion and projecting out of the cap body for applying the contents of the bottle responsive to rolling of the ball upon a selected surface, said cap body including an inwardly directed circumferential flange disposed to press against the lip whereby the ball is pressed upon threading of the cap body onto the neck to a predetermined extent, said ball when pressed by the lip being held against rotation in the cupped portion in position to seal the dispensing opening, the ball retainer including a skirt depending from the cupped portion and comprising the part of the ball retainer engageable in the neck, said ball retainer being formed with a downwardly facing, circumferential shoulder adapted to bear against the outer end of the neck on engagement of the ball retainer in the neck, the ball retainer being formed intermediate its ends with a transverse partition separating the cupped portion from the skirt, said dispensing opening being formed in the partition.

5. A combined cap and dispenser for a perfume bottle having an externally threaded neck, comprising a flexible ball retainer engageable in said neck and having a cupped portion formed at its bottom with a dispensing opening and at its top with an inwardly extending lip, a tubular cap body threaded for engagement with the threads of the neck and enclosing the ball retainer, and a ball rotatably seated in said cupped portion and projecting out of the cap body for applying the contents of the bottle responsive to rolling of the ball upon a selected surface, said cap body including an inwardly directed circumferential flange disposed to press against the lip whereby the ball is pressed upon threading of the cap body onto the neck to a predetermined extent, said ball when pressed by the lip being held against rotation in the cupped portion in position to seal the dispensing opening, the ball retainer including a skirt depending from the cupped portion and comprising the part of the ball retainer engageable in the neck, said ball retainer being formed with a downwardly facing, circumferential shoulder adapted to bear against the outer end of the neck on engagement of the ball retainer in the neck, the ball retainer being formed intermediate its ends with a transverse partition separating the cupped portion from the skirt, said dispensing opening being formed in the partition, the dispensing opening being formed with radial notches angularly spaced thereabout.

6. A combined cap and dispenser for a perfume bottle having an externally threaded neck, comprising a flexible ball retainer engageable in said neck and having a cupped portion formed at its bottom with a dispensing opening and at its top with an inwardly extending lip, a tubular cap body threaded for engagement with the threads of the neck and enclosing the ball retainer, and a ball rotatably seated in said cupped portion and projecting out of the cap body for applying the contents of the bottle responsive to rolling of the ball upon a selected surface, said cap body including an inwardly directed circumferential flange disposed to press against the lip whereby the ball is pressed upon threading of the cap body onto the neck to a predetermined extent, said ball when pressed by the lip being held against rotation in the cupped portion in position to seal the dispensing opening, the ball retainer including a skirt depending from the cupped portion and comprising the part of the ball retainer engageable in the neck, said ball retainer being formed with a downwardly facing, circumferential shoulder adapted to bear against the outer end of the neck on engagement of the ball retainer in the neck, the ball

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retainer including external radial lugs engaged by the cap body on threading of the cap body onto said neck.

7. A combined cap and dispenser for a perfume bottle having an externally threaded neck, comprising a flexible ball retainer engageable in said neck and having a cupped portion formed at its bottom with a dispensing opening and at its top with an inwardly extending lip, a tubular cap body threaded for engagement with the threads of the neck and enclosing the ball retainer, and a ball rotatably seated in said cupped portion and projecting out of the cap body for applying the contents of the bottle responsive to rolling of the ball upon a selected surface, said cap body including an inwardly directed circumferential flange disposed to press against the lip whereby the ball is pressed upon threading of the cap body onto the neck to a predetermined extent, said ball when pressed by the lip being held against rotation in the cupped portion in position to seal the dispensing opening, the ball retainer including a skirt depending from the cupped portion and comprising the part of the ball retainer engageable in the neck, said ball retainer being formed with a downwardly facing, circumferential shoulder adapted to bear against the outer end of the neck on engagement of the ball retainer in the neck, the ball retainer including external radial lugs engaged by the cap body on threading of the cap body onto said neck, said lugs projecting outwardly from the cupped portion of the retainer.

8. A combined cap and dispenser for a perfume bottle having an externally threaded neck, comprising a flexible ball retainer engageable in said neck and having a cupped portion formed at its bottom with a dispensing opening and at its top with an inwardly extending lip, a tubular cap body threaded for engagement with the threads of the neck and enclosing the ball retainer, and a ball rotatably seated in said cupped portion and projecting out of the cap body for applying the contents of the bottle responsive to rolling of the ball upon a selected surface, said cap body including an inwardly directed circumferential flange disposed to press against the lip whereby the ball is pressed upon threading of the cap body onto the neck to a predetermined extent, said ball when pressed by the lip being held against rotation in the cupped portion in position to seal the dispensing opening, the ball retainer including a skirt depending from the cupped portion and comprising the part of the ball retainer engageable in the neck, said ball retainer being formed with a downwardly facing, circumferential shoulder adapted to bear against the outer end of the neck on engagement of the ball retainer in the neck, the ball retainer including external radial lugs engaged by the cap body on threading of the cap body onto said neck, said lugs projecting outwardly from the cupped portion of the retainer, and angularly spaced one hundred and twenty degrees apart about the ball retainer circumference.

9. A combined cap and dispenser for a perfume bottle having an externally threaded neck, comprising a flexible ball retainer engageable in said neck and having a cupped portion formed at its bottom with a dispensing opening and at its top with an inwardly extending lip, a tubular cap body threaded for engagement with the threads of the neck and enclosing the ball retainer, and a ball rotatably seated in said cupped portion and projecting out of the cap body for applying the contents of the bottle responsive to rolling of the ball upon a selected surface, said cap body including an inwardly directed circumferential flange disposed to press against the lip whereby the ball is pressed upon threading of the cap body onto the neck to a predetermined extent, said ball when pressed by the lip being held against rotation in the cupped portion in position to seal the dispensing opening, the ball retainer including a skirt depending from the cupped portion and comprising the part of the ball retainer engageable in the neck, said ball retainer being formed with a downwardly facing, circumferential shoulder adapted to bear against the outer end of the neck on engagement of the ball retainer in the neck, the ball

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der adapted to bear against the outer end of the neck on engagement of the ball retainer in the neck, the ball retainer being formed intermediate its ends with a transverse partition separating the cupped portion from the skirt, said dispensing opening being formed in the partition, said partition being of flexible formation so as to be flexed into a concavo-convex shape, responsive to seating of the ball in position to seal the dispensing opening, said cupped portion serving as a reservoir for a supply of perfume flowed therein upon inversion of the bottle.

10. A combined cap and dispenser for a perfume bottle as defined in claim 8, wherein the ball retainer has spaced inner radial lugs on its inner surface adapted to be engaged by the ball.

11. A combined cap and dispenser for a perfume bottle having an externally threaded neck, comprising a flexible ball retainer engageable in said neck and having a cupped portion formed at its bottom with a dispensing opening, and formed at its top with an inwardly extending lip, a tubular cap body threaded for engagement with the threads of the neck and enclosing the ball retainer, and a ball floatingly mounted in said cupped portion and normally projecting out of the cap body for applying the contents of the bottle responsive to rolling the ball upon a selected surface, said cap body including an inwardly

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directed circumferential flange disposed to press against the lip whereby the ball is pressed upon threading of the cap body onto the neck to a predetermined extent, said ball when pressed being held against rotation by the flange and being seated in the cupped portion in position to seal the dispensing opening, the ball retainer including a skirt depending from the cupped portion and being formed intermediate its ends with a transverse partition separating the cupped portion from the skirt providing a reservoir for the perfume, said dispensing opening being formed in the partition, said cap body being adapted to seal the reservoir and bottle upon rotation in one direction and to open the reservoir and bottle upon rotation in the opposite direction.

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