May 29, 1962 W. A. SCHAICH 3,036,328

BALL-TYPE FLUID APPLICATOR PACKAGE

Filed Aug. 6, 1958 2 Sheets-Sheet 1

FIG. 3

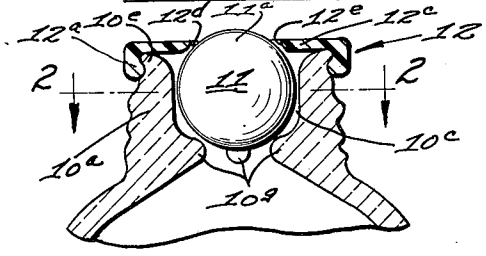
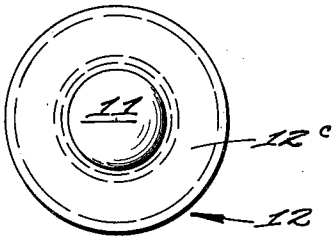
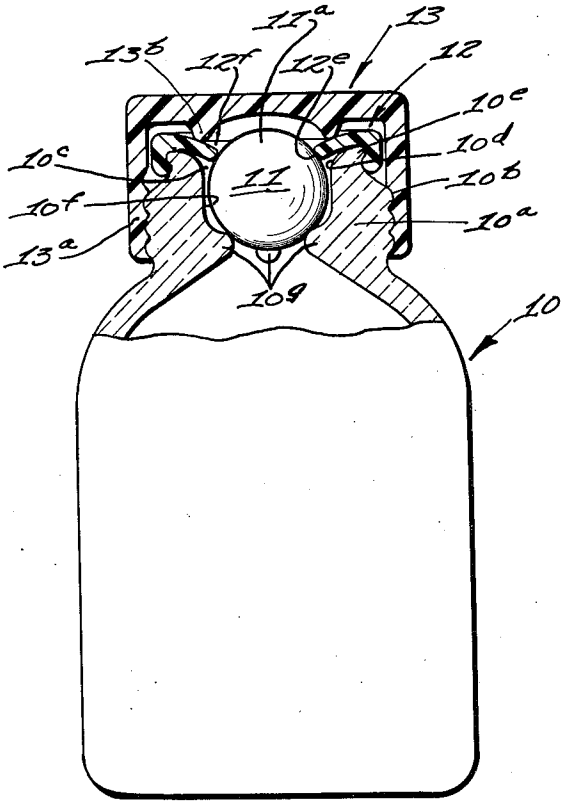


FIG. 4





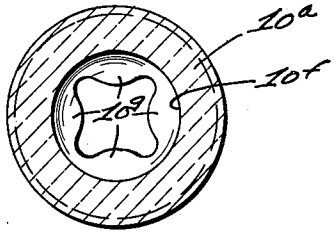


FIG. 2

FIG. 1

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May 29, 1962 W. A. SCHAICH 3,036,328

BALL-TYPE FLUID APPLICATOR PACKAGE

Filed Aug. 6, 1958 2 Sheets-Sheet 2

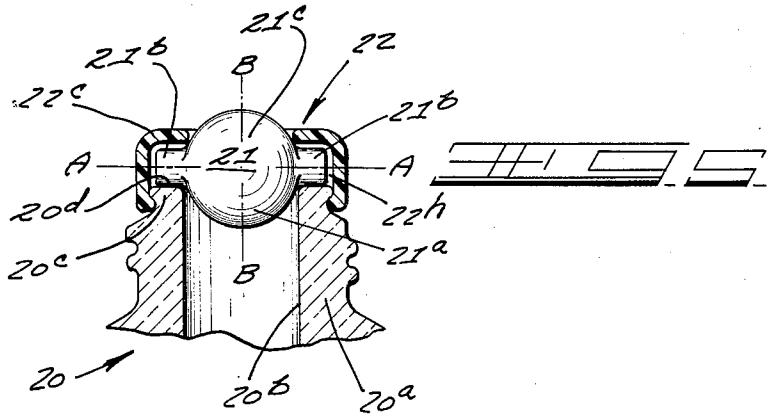


FIG 5

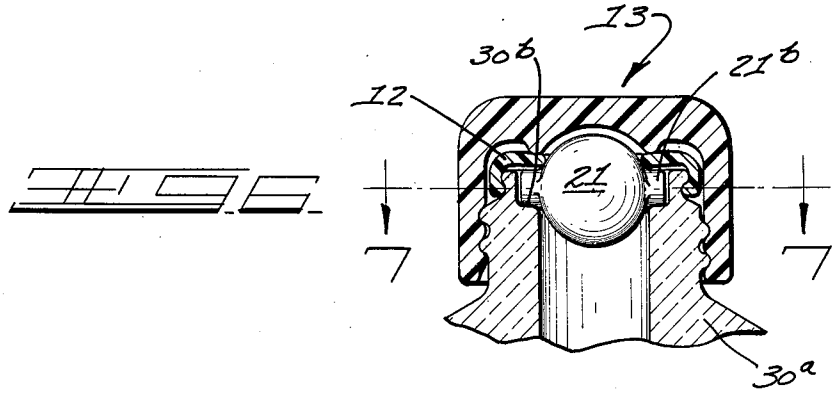


FIG 6

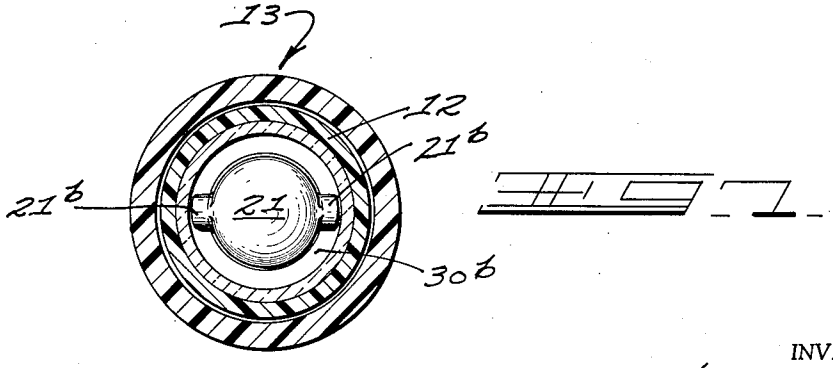


FIG 7

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BALL-TYPE FLUID APPLICATOR PACKAGE

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Filed Aug. 6, 1958, Ser. No. 753,863
9 Claims. (Cl. 15—572)

This invention relates to an improved fluid applicator package and, more particularly, to that type of applicator package characterized by the provision of a rotatable applicating member or device which functions as a fluid applicator by transferring a film of fluid from the applicator package onto a selected surface, against which the applicating member is brought into rolling contact.

A principal object of this invention is to provide an improved fluid applicator package in which there is embodied an improved applicator assembly possessing a novel structure which facilitates the mounting of a rotatable applicating member on the dispensing end of a container, and which operates to promote a smooth and uniform application of fluid substances packaged within the container.

Another object of this invention is to provide an applicator assembly having the above-described characteristics, in which the applicating member is positioned at least in part within the confines of the dispensing end of the container and retained in such position by a resilient retaining fitment which permits the applicating member to be rotated during the application of such fluid substances without becoming dislodged from assembly with the container.

A further object of this invention is the provision of a cap or closure which is threadably engageable with the neck of a container on which an applicator assembly of the above-described characteristics has been attached, and which functions in such manner that when it is threaded onto the container neck it urges the retaining fitment into sealing engagement with the surface of the applicating member to thereby isolate the fluid contents within the container and prevent leakage of such contents when the applicator is not in use.

A still further object of this invention is to provide a container having a neck portion provided with a ball seat formed in such manner as to accommodate a portion of the applicating member in a loosely retained applicating position within the neck portion of the container.

A still further object of this invention is to provide a fluid applicator package in which there is embodied an improved combination of a fluid dispensing container, an applicating member, a resilient retaining fitment for the applicating member, and a cap or closure for capping the container, wherein the container has a neck portion in which a portion of the applicating member may be seated for rotatable movement, and wherein the retaining fitment retains the applicating member in such position, while permitting a minor portion or minor diameter chordal portion of the applicating member to protrude through the retaining fitment for applicating purposes, and wherein the closure, when tightly attached to the container, will enclose the applicating member and retaining fitment and will urge the retaining fitment into sealing engagement with the surface of the applicating member.

A particular object of the present invention is the provision of a liquid applicator package having the combined provision of an applicating member, a container having a neck portion within which the applicating member may be seated, a retaining fitment for the loose retention of the applicating member on said neck portion, and a closure for capping the neck portion when the applicating member is not being utilized, wherein said closure, when

tightly capping said neck portion, will cause a portion of said retaining fitment to be resiliently displaced from a normal applicating position located exteriorly of said neck portion to a position located within the confines of said neck portion and sealingly engaging the surface of said applicating member, and to this end providing the container neck portion with a tapered rim portion, and the closure with a projection cooperating with said rim, to facilitate the displacement of the retaining fitment.

Another particular object of this invention is the provision of an improved liquid applicator package having the last-mentioned characteristics, wherein the retaining fitment is of resilient construction and will return to its normal position proximately spaced from the surface of the ball applicator when the closure is unloosened from the container, such position corresponding to the position which it occupies when the package is being utilized for applicating purposes.

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 sheets of drawings on which, by way of preferred example only, are illustrated the preferred embodiments of this invention.

On the drawings:

FIG. 1 is a fragmentary elevational view in central section representing an improved fluid applicator package constructed and assembled in accordance with the principles of this invention, and illustrating the functional aspect of the various assembled components as they appear when the applicator package is in its relative closed and sealed relationship.

FIG. 2 illustrates a sectional view taken along the plane 2—2 in FIG. 3, with the ball applicator omitted for clarity of illustration.

FIG. 3 is a sectional view similar to FIG. 1, showing the functional aspect of the fluid applicator package when the closure has been removed preparatory to application of the contents of the container.

FIG. 4 is a plan view of the structure illustrated in FIG. 3, more clearly illustrating a preferred configuration of the retaining fitment.

FIG. 5 is a fragmentary elevational view in central section illustrating another embodiment of this invention.

FIG. 6 is a fragmentary elevational view in central section showing still another embodiment of this invention, and showing the functional aspect of the applicating device when a closure is attached to the neck of the container.

FIG. 7 is a sectional view taken along the plane 7—7 in FIG. 6.

With reference to FIG. 1, there is illustrated a liquid applicator package comprising, generally: a fluid dispensing container 10 having a neck portion 10a; a spherically shaped ball applicator 11 of suitable diameter to permit it to seat loosely within the neck portion; a resilient annular retaining fitment 12 which snaps over the end of the neck portion to maintain the ball applicator in assembled position; and a closure 13 which threadably attaches to the exterior surface of the neck portion and cooperates with the neck portion in such manner as to cause the retaining fitment 12 to sealingly engage the surface of the ball applicator when the applicator is not in use. However, as illustrated in FIG. 3, when the closure 13 is detached from the neck portion 10a, such as for the purpose of utilizing the applicator package, the resilient nature of the retaining fitment 12 causes it to disengage from the surface of the ball applicator 11 and resume a normal position proximately spaced therefrom, in order to permit the ball applicator to be universally ro-

tated and thereby transfer the fluid contents of the container in a smooth and uniform manner when the container is placed in an inverted position.

The container **10**, which is suitably of glass, plastic, or metallic construction, or other such materials capable of retaining a fluid substance, is provided in conventional manner with a reduced diameter neck portion **10***a*, which is externally threaded, as at **10***b*, for attachment of the closure **13**. At the dispensing end or mouth **10***c* of the container, the neck portion defines an inwardly tapered rim **10***d*, which slopes downward into the interior of the neck portion to form a frusto-conical configuration. At its outer edge, the rim **10***d* merges into an annular retaining bead **10***e* encircling the rim, and at its inner edge the rim merges with the interior surface **10***f* of the neck portion. Spaced axially inwardly from the tapered rim **10***d*, the interior surface **10***f* converges to form at least one integral internal projection **10***g*, restricting the opening in the neck portion to a diameter somewhat less than that of the ball applicator **11** and thereby restricting the latter against inward displacement from the opening in the neck portion. In FIG. 2, four such projections **10***g* are shown, and these projections provide a seat upon which the ball applicator may be retained and universally rotated. The spacing of these projections relative to the tapered rim **10***d* is such that the ball applicator **11**, when seated thereon, will occupy a position in which a major portion of the ball applicator will rest within the confines of the neck portion **10***a*, and a minor portion or segment thereof will protrude outwardly from the rim in order to enable the ball applicator to be brought into direct rolling contact with and furnish fluid to the surface to which application is desired.

The ball applicator **11**, with which the fluid contents from the container are applied, defines a generally spherical configuration and is provided with a relatively smooth surface finish capable of permitting the ball applicator to be rolled in contact with a surface such as the sensitive human skin without causing undue irritation. Materials such as glass, plastic, or metal appear to be the most favorable materials from which to fabricate such an applicator.

The assembled relationship of the container **10** and the ball applicator **11** is such that the ball applicator is loosely retained within the confines of the container neck portion **10***a* and seats upon the internal projections **10***g* in such manner that, as previously indicated, a major portion of the ball applicator will rest within the neck portion of the container, and a minor portion or a minor diameter chordal portion **11***a* will protrude outwardly beyond the rim **10***d* to permit rolling contact between the ball applicator and the surface to which the fluid substance is to be applied.

To retain the ball applicator **11** within the container neck portion **10***a*, the resilient annular retaining fitment **12**, which is characterized by a disk-like structure or membrane preferably fabricated from a resilient flexible material such as polyethylene, rubber, or other comparable materials having properties of resiliency, flexibility and sealability, has integrally formed about its margin a depending skirt **12***a* which is shaped to conform to the configuration of the retaining bead **10***e* formed on the end of the container neck portion **10***a*, and over which the depending skirt is adapted to be retained in snap-fit relationship. As illustrated in FIG. 3, the retaining fitment **12**, when so positioned, has an annular web portion **12***c* which projects directly across the end of the neck portion and surrounds the ball applicator **11** at the mouth **10***c* of the container. Extending through the center of the web portion **12***c*, there is a central opening **12***d* which is defined by a circular sealing surface **12***e*, which is tapered to generally conform to the surface configuration of the ball applicator **11**. As illustrated, the central opening **12***d* is of such size as to permit the minor diameter chordal portion **11***a* of the ball applicator to protrude therethrough in relative proximately spaced relationship. It will also be noted that the size of the central opening **12***d* is of lesser diameter than the diameter of the ball applicator **11** and, consequently, prevents the ball applicator from being dislodged from its assembled position.

The closure **13**, which is of conventional cup-shaped configuration, may be fabricated from a rigid plastic or metallic material and is provided with an internally threaded skirt portion **13***a* which may be threadably engaged with the external threads **10***b* formed on the container neck portion **10***a* or otherwise removably attached as by providing it and the neck portion with snap-on means. Integrally formed in the interior closed end surface of the closure **13**, there is an annular deflection rib **13***b* which is shaped to coincide with the upper surface **12***f* of the retaining fitment at a location proximately overlying the inner edge of the tapered rim **10***d* of the container neck portion. The presence of the deflection rib **13***b* permits the closure, when threadably engaged with the neck portion **10***a* of the container, to engage the web portion **12***c* of the retaining fitment and flex it downward over the tapered rim **10***d* so that the circular sealing surface **12***e* is pressed into sealing engagement with the surface of the ball applicator **11** to form a seal located within or interiorly of the neck portion **10***a*, substantially as shown in FIG. 1, to prevent leakage and inhibit evaporation of the fluid substance within the container during periods when the applicator is not being used.

As illustrated in FIG. 3, the resilient and flexible nature of the retaining fitment **12** causes the annular web portion **12***c* and sealing surface **12***e* to return to their normal proximately spaced relationship relative to the surface of the ball applicator **11** when the closure is removed preparatory to application of the fluid contents by the ball applicator.

An applicator assembly such as that just described affords a novel construction in which the retaining fitment is characterized by a highly simplified and economical disk-like design. Furthermore, the overall length of the applicator package is materially shortened by placing the ball applicator within the neck portion of the container, rather than over the top of the neck portion as in most of the more conventional types of ball applicator assemblies. Nevertheless, a fluid applicator package having the aforementioned construction may be manipulated with exceptional ease and permits the fluid contents of the container to be rolled onto the desired surface in the form of a smooth and uniform film of liquid.

It will, of course, be understood that various details of construction may be modified throughout 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.

The foregoing essentially constitutes the specification of my application Serial No. 632,221, filed January 2, 1957, and now abandoned, of which this application is a continuation-in-part.

Supplementary to said disclosure and description, the embodiments illustrated respectively in FIGS. 5, 6 and 7 have been added herein.

Referring to FIG. 5, it will be observed that a fluid dispensing container **20**, similar in external appearance to the dispensing container **10**, previously described, is formed with the interior surface **20***b* of the reduced diameter neck portion **20***a* defining a smooth bore communicating with the interior of the container. The necessity of providing a restricted area within the interior of the neck portion **20***a*, such as the projections **10***g* in the neck portion of container **10**, shown in FIGS. 1–4, is obviated in the present embodiment by virtue of the particular shape and construction of the applicat-

ing device 21 with which the container's contents are applied, and which is to be next described.

The applicating device 21 is preferably fabricated from the same type of materials as applicating ball 11 and has a spherically shaped body portion 21*a* seated within the mouth of the bore defined in the dispensing end 20*c* of the container neck portion 20*a*, and is supported for rotational movement in such position by laterally extending supporting members such as cylindrical pins 21*b*, which gravitationally rest upon the rim 20*d* of the dispensing end 20*c* and are free to shift on the surface of said rim in response to movement of the applicating device 21 in contact with the surface to which the container's contents are to be applied. The pins 21*b* are preferably formed as an integral part of the applicating ball 21 and extend outwardly from diametrically opposite sides thereof. When the applicating device 21 is supported in the foregoing manner, a segment of the body portion 21*a* of the applicating device protrudes axially outward from the dispensing end 20*c* of the container 20, as at 21*c*, for convenient unrestricted contact with the surface to which the contents of the container are intended to be applied.

Considerable variability in the movement of the applicating device 21 is provided, since the applicating device 21 is free to rotate simultaneously or separately about either of two different axes disposed in perpendicular relation to each other and corresponding respectively to the longitudinal axis A of the pins or rollers 21*b* and axis B, which is situated in substantially coaxial alignment with the longitudinal axis of the container neck portion 20*a*. As a result, a biaxial rotational movement of the applicating device 21 is afforded, which promotes relatively unrestricted manipulation thereof during application and which facilitates a smooth and uniform transferal of the container's contents.

As illustrated, the applicating device 21 is retained in assembled position by a resilient retaining fitment 22, which is substantially the same in structure and function as the retaining fitment 12 described previously with respect to the embodiment shown in FIGS. 1 and 3. However, in the present embodiment the annular web portion 22*c* of the fitment 22 overlies the rim 20*d* of the container 20 in spaced relationship to define an annular internal pocket, as at 22*h*, within which the pins or alternatively rollers 21*b* of the applicating device are free to slide, if in the form of pins, or roll or rotate, if in the form of rollers on the rim 20*d* of the container without substantial obstruction.

As illustrated in another embodiment shown in FIGS. 6 and 7, the interior surface of the container neck portion 30*a* is modified somewhat and defines a radial upwardly facing shoulder 30*b* having a smooth continuous surface surrounding the bore of the neck portion and on which the pins or rollers 21*b* of the applicating device 21 are gravitationally supported for biaxial rotation in substantially the same manner as previously described with respect to the embodiment shown in FIG. 5. The shoulder 30*b* may be provided by forming a recess in the interior surface of the neck portion 30*a*, as shown, or may be otherwise provided, such as for example, by forming an inwardly projecting continuous ledge thereon (not shown). Also, as illustrated, the fitment may be identical in shape with the fitment 12 shown in FIGS. 1–4.

In other respects the structure and function of the embodiments shown in FIGS. 5–7 are substantially identical with the embodiment shown in FIGS. 1–4, and as illustrated in FIG. 6, the closure 13 when threadably attached to the neck portion of the container resiliently depresses the inner periphery of the fitment into sealing contact with the spherically shaped body portion of the applicating device 21.

Among other advantages, the embodiments shown in FIGS. 5–7, afford a reduction in the preciseness ordinarily required in the fabrication of an applicating ball, such as shown in FIGS. 1–4. Additionally, since the rotation of the applicating device is restricted to a biaxial rotational motion rather than universal rotational motion, the applicating device is readily suited to more economical fabricating techniques involving the use of split molds, and the like, for the molding of the applicating device, where as such techniques have been ordinarily unfavorable for molding the conventional ball-shaped applicating members, such as shown in FIGS. 1–4.

By showing and describing several specific constructions embodying the present invention, it is not intended to limit the invention, except as required by the scope of the following claims, since it will be apparent to those skilled in the art that various changes and modifications may be made in the particular form, construction and arrangement of parts without departing from the scope and intendment of the invention and without sacrificing the advantages thereof.

Having thus described the invention, I claim:

1. In a fluid applicator package comprising a container having a neck portion defining a dispensing opening, the improvement comprising: an applicating member carried by said neck portion and having a spherically shaped body portion disposed in said dispensing opening and partly protruding outward from said dispensing opening; a resilient membrane transversely superimposed over said dispensing opening and confining said applicating member in assembled relationship with said neck portion, said membrane being provided with an aperture receiving said outwardly protruding body portion of said applicating member therethrough in proximately spaced relationship; and detachable closure means for said neck portion, said detachable closure means having internal means engaging said membrane adjacent to said body portion of said applicating member and depressing same into sealing engagement therewith as said closure is being attached to said neck portion.

2. A fluid applicator package comprising a container having a hollow neck portion, an applicator ball freely inserted in said neck portion, said neck portion having at least one internal projection limiting the insertion of said applicator ball to a depth where only a minor diameter chordal portion of said ball projects outwardly beyond the end of said neck portion, a flexible disk of resilient material mounted on said neck portion, said flexible disk having an annular disk portion overlying the opening defined by said neck portion and surrounding said minor diameter chordal portion of said applicator ball in proximately spaced relationship, the opening in said annular portion being of lesser diameter than said applicator ball to thereby confine said applicator ball within said neck portion for rotatable movement, and a closure for said neck portion, said closure having an internal annular deflection rib engaging the inner margin of said annular disk portion to deflect the inner periphery of said annular disk portion inwardly into sealing engagement with said applicator ball as said closure is attached to said neck portion.

3. A fluid applicator package comprising: a container having a hollow neck portion defining a dispensing opening; an applicator ball, said applicator ball being rotatably supported by said neck portion within said dispensing opening and with a major portion of its surface housed within said dispensing opening, and a minor portion thereof protruding outwardly therefrom; a resilient annular disk mounted on said neck portion and extending across said dispensing opening, the inner periphery of said disk forming an annular sealing surface proximately spaced from the outwardly protruding portion of said ball; and a closure for said neck portion, said closure having means for detachable securement thereof to said container and having a projecting inner portion overlying said dispensing opening and depressing said annular sealing surface

into sealing engagement with said ball as said closure is secured to said container.

4. In a fluid applicator package having a container mounting a rotatable applicator ball, the improvement comprising: a dispensing end formed on said container housing a major portion of said applicator ball and maintaining same in such position that only a minor portion of said applicator ball protrudes outwardly from said dispensing end; a resilient membrane transversely superimposed over said dispensing end and confining the major portion of said ball within said dispensing end, said membrane being provided with an aperture receiving said protruding minor portion of said applicator ball therethrough in proximately spaced relationship; and a detachable closure for said dispensing end, said closure having internal means engaging said membrane adjacent to said applicator ball and depressing same into sealing engagement with said ball as said closure is being attached to said dispensing end.

5. The combination defined in claim 4 wherein said dispensing end of the container has an internally tapered surface underlying said closure internal means permitting greater deflection of said membrane by said closure.

6. A fluid applicator package comprising: a container having a neck portion defining a dispensing opening; a rotatable applicating device disposed in said dispensing opening and having an integral pair of cylindrical supporting members extending laterally outward from opposite sides thereof and freely resting on opposite sides of said neck portion for rotational movements thereon; a resilient membrane transversely superimposed over said dispensing opening and loosely confining said applicating device in assembly with said neck portion, said membrane defining an aperture receiving a minor segment of said applicating device therethrough in proximately spaced relationship for rolling contact with the surface to which the container's contents are to be applied; and detachable means for said neck portion, said detachable means having internal means engaging said membrane adjacent to said applicating device and depressing same into sealing engagement therewith as said detachable means is being attached to said neck portion.

7. A rotatable applicating device for use with a container having a neck portion defining a dispensing opening and provided with fastening means for removable attachment of a closure over said dispensing opening and comprising: a body portion adapted to loosely fit within said dispensing opening and having an integral pair of cylindrical supporting members respectively extending laterally outward from opposite sides of said body portion a sufficient distance to freely rest on opposite sides of said neck portion for rotational movement of said body portion; a resilient membrane shaped to fit transversely over said dispensing opening and having means for fastening said membrane thereover to loosely confine said applicating device in assembly with said neck portion, said membrane defining an aperture accommodating a minor segment of said body portion of said applicating device therethrough in proximately spaced relationship to permit rolling contact of said minor segment with the surface to which the container's contents are to be applied, a closure having fastening means adapted to cooperate with said fastening means on said neck portion for removable attachment of said closure on said neck portion, said closure also having internal means for engaging said membrane adjacent to said body portion of said applicating device and depressing same into sealing engagement therewith when said closure is attached to said neck portion.

8. In combination with a container having a neck portion carrying therewithin an outwardly protruding ball-type applicating device and defining a dispensing opening communicating with said applicating device, a resilient annular membrane having a depending marginal bead fitting over the rim of said neck portion in snap-fit relationship and defining a central aperture shaped to accommodate a minor protruding portion of said ball-type applicating device therethrough, and closure means detachably fastened to said container neck portion, said closure means having an internal projecting rib coinciding with said membrane and depressing same into sealing contact with the surface of said applicating device when said closure means is attached to said neck portion.

9. The structure defined in claim 8, wherein said aperture is defined by a tapered wall forming a sealing surface extending continuously around a peripheral segment of said applicating device.

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