July 2, 1963 C. J. GONNELLA ETAL 3,095,598

DISPENSING CONTAINER

Filed May 16, 1960

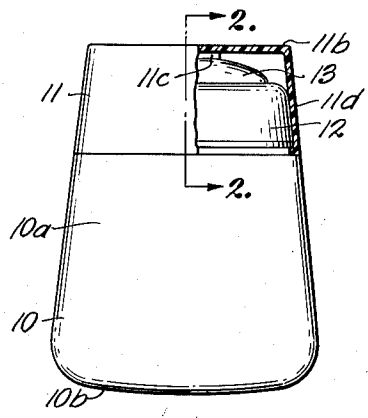

Fig. 1.

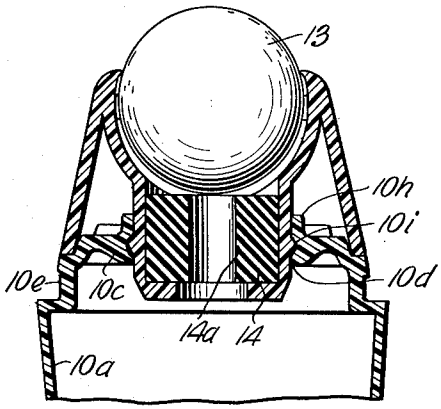

Fig. 3.

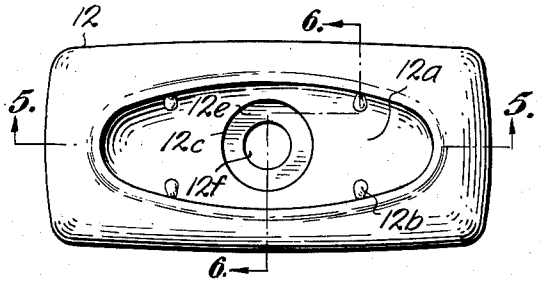

Fig. 4.

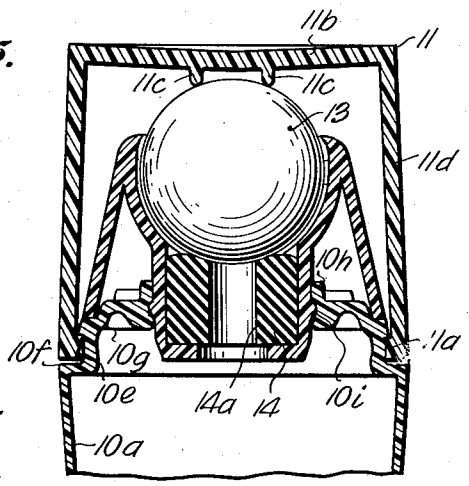

Fig. 2.

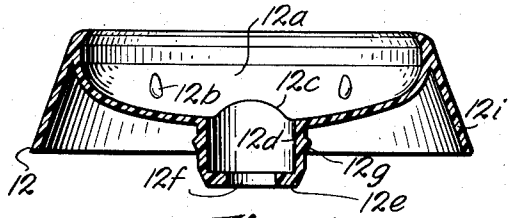

Fig. 5.

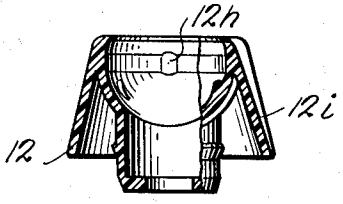

Fig. 6.

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DISPENSING CONTAINER

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This invention relates to containers employing a roller element to dispense the liquid contents thereof and refers more particularly to improvements in containers particularly employing elliptical primary roller elements for the dispensing of the container contents.

Roll-on containers employing a spherical ball-like applicator in a socket are well-known to the art. Typical patents showing this art include the patent to Holler, Jr., 2,883,690, issued April 28, 1959, for "Fluid Dispensing Ball Applicator"; the patent to Whitney, 2,823,403, issued February 18, 1958, for "Ball and Socket Plastic Fitment"; the patent to Ackerman, 2,807,817, issued October 1, 1957, for "Liquid Dispenser and Applicator"; the patent to Thomas, 2,749,566, issued June 12, 1956, for "Dispenser"; the patent to De Brock, 2,700,784, issued February 1, 1955, for "Ball-Type Liquid Applicator and Closure for Same"; and the patent to Testa, 1,977,414, issued October 16, 1934, for "Perfume Dispenser."

When applying liquids (such as deodorants) of various sorts to areas of the human skin or the like, it has been discovered desirable in various applications to employ roller elements which vary from circular in cross section to elliptical in side view in one dimension or in cross section in one dimension. As a substantial elliptical shape is approached, greater area of contact is provided, which is desirable for applying deodorants, perfumes or the like. The problem of adequately sealing an elliptical roller element in its seat (to prevent liquid flow from the container when the top thereof is on) is very difficult, particularly when the seal is desired to be made in a plastic seat for the roller element. Such plastic seats are conventionally relatively deformable in themselves and, also, not commercially fabricable or formable beyond a certain level of accuracy. The more elongate the ellipse and the more flexible the material of the plastic seat, the less likelihood of obtaining a uniform satisfactory seal. Various additive sealing constructions have been built into plastic seats for elliptical rollers, but none have provided effective seals under all necessary conditions. Additionally, it is desired to minimize the expense of the roll-on fitting as the container and roll-on element are regarded as disposable items.

Therefore, an object of the instant invention is to provide means for sealing in adequate fashion an elliptical roller element for dispensing liquids from containers.

Another object of the invention is to provide such means for sealing which are simple in construction, relatively easy to manufacture and relatively inexpensive.

Another object of the invention is to provide means for sealing elliptical rollers which involve the combination therewith of a resilient element, the latter preferably substantially cylindrical in form.

Another object of the invention is to provide an insert construction including an elliptical roller element, which insert is adapted to seal the container against flow therefrom when the container top is applied and dispense the liquid from the container when the top is removed.

Another object of the invention is to provide an elliptical roller element and seal therefor for roller dispenser containers which will meet all of the seal tests of conventional spherical roller element roll-on containers as to temperature, pressure and inverted position sealing.

Another object of the invention is to provide a roll-on container construction which combines the applicator features of an elliptical roller with the sealing features of a spherical roller.

Other and further objects of the invention will appear in the course of the following description.

In the drawings, which form a part of the instant invention and are to be read in conjunction therewith, embodiments of the invention are shown and, in the various views, like numerals are employed to indicate like parts.

FIG. 1 is a side elevation, partly cut away and in section, of an inverted elliptical roll-on container embodying the invention with the top thereof in place.

FIG. 2 is a fragmentary sectional view taken along the line 2—2 of FIG. 1 in the direction of the arrows.

FIG. 3 is a fragmentary sectional view similar to that of FIG. 2 but with the container top removed and the roller element in dispensing position.

FIG. 4 is a top plan view of the roller assembly casing with the elliptical roller element removed therefrom.

FIG. 5 is a sectional view taken along the line 5—5 of FIG. 4 in the direction of the arrows.

FIG. 6 is a sectional view taken along the line 6—6 of FIG. 4 in the direction of the arrows.

FIGS. 1 and 2 show the container in normal storage condition with FIGS. 1 and 2, however, inverted from the normal storage position. The invention comprises, in combination, a container body, a preferably elliptical roller element and a fitment including: a first socket for the elliptical roller element, a resilient element, the latter preferably of cylindrical form with an opening therethrough, a second socket for the resilient element and two openings communicating out of the second socket—one opening into the first socket and one opening into the body of the container. This fitment may be applied to and mounted on the container body in a number of ways. The method of applying the roller element and fitment to the container body illustrated is only typical and should not be construed as limiting.

Referring first to FIG. 1, therein is shown a container construction having three basic parts. The first part is the container body portion generally designated at **10**, the second the container top portion generally designated at **11**, and the third the roller fitment generally designated at **12**. These parts will be described in the order named. All container parts except the roller which is made of glass or like rigid material, may preferably be formed of polyethylene or like resilient plastic material.

The container body **10** has a circumferential side wall **10***a*, an upper unbroken end wall **10***b* continuously connected to or formed continuous with side wall **10***a* and lower end wall **10***c* which has an opening **10***d* preferably centrally thereof, to be described. A continuous circumferential groove **10***e* is formed in side wall **10***a* of the container body **10** just above lower end wall **10***c*. Wall **10***a* is preferably recessed inwardly to form groove **10***e* and an extension **10***f* defines the lower wall of the groove. The wall **10***c* is preferably recessed at **10***g* the width of the roller insert skirt to be described.

Central opening **10***d* is preferably, though not necessarily, circular in form. Opening **10***d* is defined by circumferential flange or ring **10***h*, fixed to or formed integral with wall **10***c* and having groove **10***i* formed centrally of the inner face thereof. Alternatively (and not shown) an inwardly-extending ridge or raised portion may be formed on the flange **10***h* if the engagement between the roller element and opening **10***d* is desired to be reversed. The thickness of flange **10***h* is preferably greater than the thickness of wall **10***c* whereby to provide greater rigidity for the engagement to be described.

The container top **11** is congruent in transverse sec-

tion to the transverse section of container body **10** and must be of sufficient depth to receive the roller assembly when the top is engaged with the container body. Means for engaging container body **10** are provided and comprise, in the instance shown, bead **11***a* formed circumferentially inwardly of the peripheral wall **11***d* of top **11**. Bead **11***a* engages groove **10***e* to form a circumferential sealing fit of the top of the container. Fixed to the inner side of lower end wall **11***b* of top **11** are flange extensions **11***c* adapted to contact the roller element when the top is in positive engagement with the container body and force the roller element or other means in contact therewith into sealing roller relationship with its seat. It should be noted that the groove-head engagement of groove **10***e* and bead **11***a* may be reversed (if desired) with the bead on the container and the groove in the top. However, it is preferred that the wall of the container be in line with the wall of the top when in engagement and this is most easily achieved in the construction shown.

The roller assembly shown employs a roller elliptical along one axis in combination with a resilient perforated element wherein the elliptical roller provides the desired large area dispensing, with the resilient element providing a proper seal when the top is on to avoid underside passage of liquid from the container body proper.

Referring particularly to the roller assembly, elliptical roller **13** (elliptical in one dimension and round in the dimension normal thereto) is received in socket **12***a*, the latter provided with a plurality of extensions **12***b* uniformly and circumferentially positioned to opening **12***c*. Cylindrical resilient element **14** of rubber, resilient plastic, or the like, having axial opening **14***a* therethrough is received in a recessed well or socket defined by upwardly-extending flange **12***d*, the latter having inwardly-extending upper edges **12***e* which taper interiorly to define upper opening **12***f*. Depending upon the engagement desired, either a ridge **12***g* (shown) or groove (not shown) is provided to engage an opposite means on flange **10***h*. Socket **12***a* surrounds, engages and overlies a sufficient portion of roller **13** so as to maintain it within the socket in use. Wells **12***h* at the extremities of the seat receive the elongate roller ends for rotational motion. Skirt **12***i* is preferably circumferentially fixed to the lowermost periphery of socket **12***a* and is so formed and of such length as to be received in recess or groove **10***g* of the container body **10**.

Reference may be made to FIG. 2 to ascertain that the engagement of the roller fitment with the top of the container is solely and primarily, as far as rigid fixing and positioning goes, effected by the central engagement of flange **12***d* with flange **10***h*. Thus this connection must be of sufficient rigidity and tenacity to retain position of the roller assembly on the container proper in normal operation of the container in dispensing liquid therefrom. Skirt **12***i* serves to keep foreign matter out of the container body **10** and out of the space between the roller insert and the container and, additionally, improve the appearance thereof. Additionally, some protection is provided to the central engagement by the skirt (depending upon the strength and rigidity thereof) against lateral forces applied. Additionally, skirt **12***i* in its abutment on wall **10***c* aids in resisting further insertion of flange **12***d* into the opening **10***d* under excessive upward pressure.

In operation of the device, the container, in inverted position as shown in FIG. 1, is filled with the liquid to be dispensed. Then the roller fitment is snapped vertically downwardly into place so that bead or ridge **12***g* fits into slot or groove **10***i* circumferentially. Skirt **12***i* aids in such positioning by fitting into groove or recess **10***g*. When top **11** is fitted over the roller assembly and container so that bead **11***a* fits into groove **10***e*, means **11***c* abuts the surface of roller **13**, forcing cylindrical grommet **14** into an expanded sealing engagement with flange **12***d*, the roller **13** on top thereof sealing the outward extension of the opening or passage **14***a* as shown in FIGURE 2 and thus preventing any influx of liquid into the space surrounding the roller and the socket **12***a*. Removal of the top permits the movement of roller **13** and grommet **14** into the position of FIG. 3 and permits flow of liquid into socket **12***a* to be transferred onto the roller by rotation thereof. The diameter of opening **14***a* may be varied as desired according to the viscosity of the liquid dispensed to permit flow of ample liquid to roller **13**. Extensions or projections **12***b*, which are flexible, serve to elevate the roller **13** on removal of the top to free opening **14***a*, yet are forceable outwardly to enable the roller to seal the grommet **14** opening **14***a* on top application.

From the foregoing it will be seen that this invention is one well adapted to attain all of the ends and objects hereinabove set forth together with other advantages which are obvious and which are inherent to the structure.

It will be understood that certain features and subcombinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by and is within the scope of the claims.

As many possible embodiments may be made of the invention without departing from the scope thereof, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described our invention, we claim:

1. A roller assembly for dispensing containers comprising a roller element having an elliptical cross section along one dimension and a substantially circular cross section normal to said one dimension; a fitment including an elliptical socket adapted to receive said roller element for rotation in the elliptical socket about said one dimension of the roller element, said roller element being movable in the elliptical socket to and from dispensing and non-dispensing positions portions of said elliptical socket closely engaging said roller element to maintain the roller element in the socket, a portion of said roller element being exposed outside said elliptical socket; said elliptical socket having an opening therein; a second socket located outside of and integral with said elliptical socket, said second socket being located around the opening in the elliptical socket thereby providing communication between the sockets; a resilient element positioned in and substantially conforming in shape to said second socket, a portion of said resilient element extending into the elliptical socket sufficient to be engageable by the roller element when the latter is in non-dispensing position and spaced from the roller element when the latter is in dispensing position an opening through said resilient element and portion thereof; an opening in said second socket located remote from the opening in the elliptical socket; said opening through the resilient element being in substantial alignment with the opening in the elliptical socket and the opening in the second socket; said roller element being movable from said dispensing position to said non-dispensing position upon the application of pressure on said exposed portion of the roller element; said dispensing position spacing the roller element from the resilient element such that an unimpeded passage is provided through said aligned openings into said elliptical socket, said non-dispensing position locating the roller element such that a portion of the roller element is in sealing engagement around the opening in said portion of the resilient element thereby closing said unimpeded passage; and said resilient element normally urging said elliptical roller element from said non-dispensing position toward said dispensing position.

2. A roller assembly as recited in claim 1 wherein said opening in the resilient element is axially aligned with and of lesser size than the openings in said elliptical and second sockets.

3. A roller assembly as recited in claim 1 wherein said

second socket is cylindrical with its axis of rotation normal to the surface of said elliptical socket, and said resilient element is a ring conforming to and located coaxially with said second socket.

4. A roller assembly as recited in claim 1 wherein a plurality of spaced projecting lugs are fixed to the surface of said elliptical socket around the opening in the elliptical socket to normally maintain said elliptical roller spaced from the elliptical socket and the opening in said resilient element.

5. A roller assembly as recited in claim 1 including a cap positionable over said fitment, said cap being engageable with the roller element to move the roller element from said dispensing position to said non-dispensing position; and means to maintain said cap in said engagement with the roller element.

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