June 21, 1966 G. N. PETTERSEN 3,256,977

FILLED PACKAGING AND DISPENSING CONTAINER

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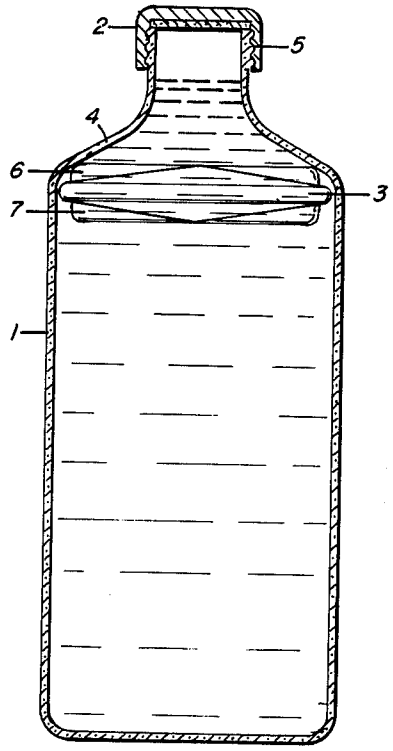


FIG. 1

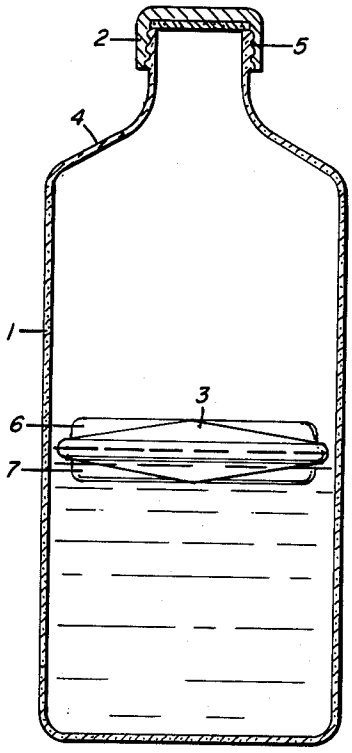


FIG. 2

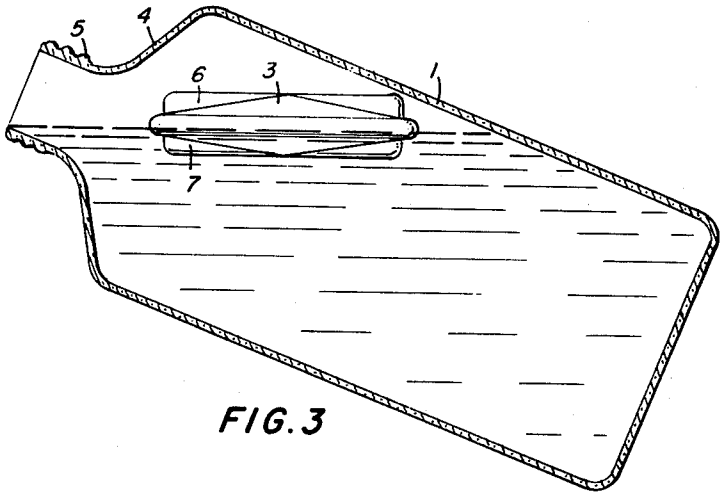


FIG. 3

FILLED PACKAGING AND DISPENSING CONTAINER

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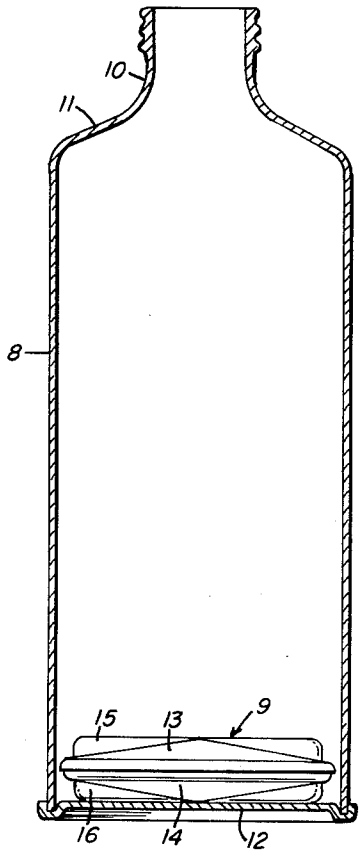


FIG. 4

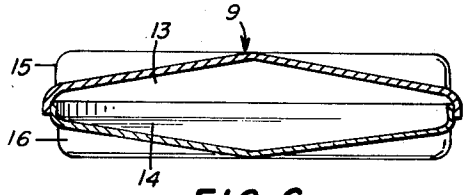


FIG. 6

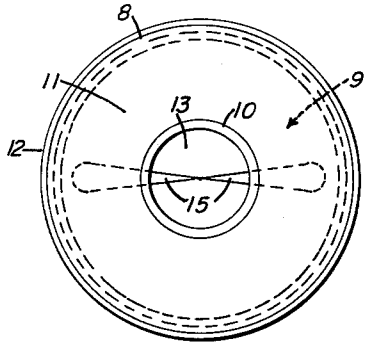


FIG. 5

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FILLED PACKAGING AND DISPENSING CONTAINER

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FIG. 7

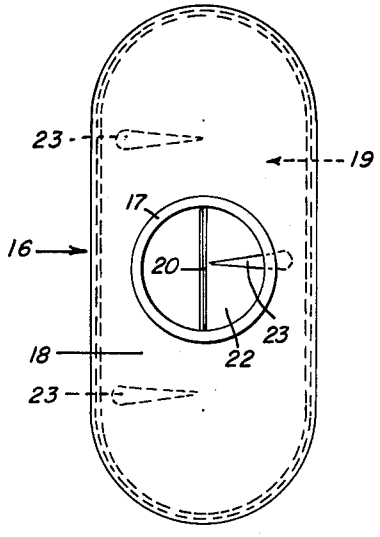
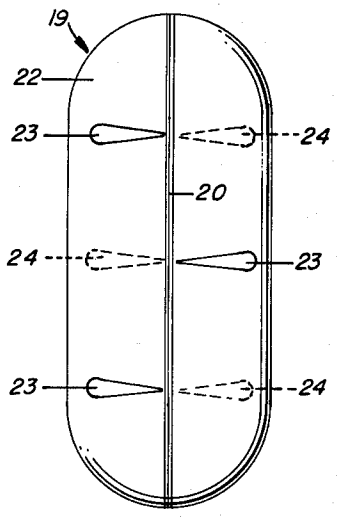


FIG. 8



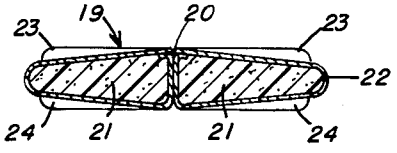


FIG. 9

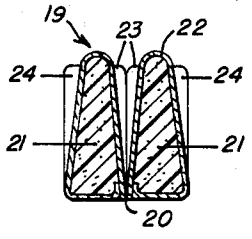


FIG. 10

United States Patent Office 3,256,977 Patented June 21, 1966

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FILLED PACKAGING AND DISPENSING CONTAINER

Gunnar Nimrod Pettersen, Askim, Norway

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5 Claims. (Cl. 206—46)

This application is a continuation-in-part of my copending application Serial No. 304,108 filed August 23, 1963, entitled "A Filled Packaging and Dispensing Container."

The present invention relates to containers for liquids of the type adapted to be dispensed or discharged over prolonged periods of time and which are sensitive to contact with the atmosphere.

Liquids which are subject to damage or deterioration when contacted with the atmosphere, such as medical oils of vegetable and marine origin (multi-unsaturated fatty acids, cod-liver oil) can as a rule be protected in a relatively reliable manner during storage in bottles, cans, tins or similar containers until the container is opened. This is possible due to the use of gaskets, seals and other tightening means and, if desired, a layer of a protecting liquid may be provided on the top. Moreover, the liquid surface is mainly located within a narrow neck affording a reduced contact area. However, if the liquid is to be discharged in positions, either at regular intervals or occasionally over a prolonged period, the oil will soon deteriorate because the space above the liquid is filled with air, which upon each discharge will be more or less renewed and at the same time occupy a constantly increasing volume. In addition, the contact area between the air and liquid will increase to the full internal cross-section of the container. Therefore, a constantly more pronounced trainy taste and a constant decrease in the contents of valuable substances, especially vitamins, can be noted. If the oil is to be used in the tropics, the conditions are considerably worse because of the increased detrimental effect of the atmosphere in such climates.

Various proposals have been made for keeping the surface of liquids in containers covered against contact with the atmosphere even after a partial discharge. For example, in containers for paint, ink and the like where the discharge is effected through an opening at the top, a removable disc provided with a handle has been used for this purpose. These discs fit into the container either snugly or with a clearance and in the latter case have been made of cork so as to float on the liquid. Due to a certain flexibility of the cork, they may be inserted and removed through a somewhat restricted top opening like those commonly used in boxes for paint.

In all these structures the cover for the liquid surface is to be removed when the liquid is to be discharged. This entails the danger of soiling the surroundings and may, especially in the case of sensitive liquids, cause undesired contamination of the same.

The present invention solves the problem in question in a manner which is more satisfactory in these respects and is well suited for protecting medical oils. Also, in this case, a floating body is used which is placed within the container and covers the major part of the cross-sectional area thereof while leaving a small clearance relative to the container wall.

According to the invention, the container is provided with a floating body permanently entrapped by a shoulder portion of the container with such shoulder portion forming a transition to a pouring neck having an outlet at the top, and at the same time such body is freely movable without being capable of sticking so that, during pouring, the body will remain flat on the liquid surface and allow the liquid to flow freely thereunder.

Thus, any removal of the floating body or cover in use is not only unnecessary, but practically impossible, so that both soiling of the surroundings and contamination of the liquid by handling of the floating body are avoided and the discharge can take place in the normal manner by pouring.

The invention is applicable to the containers of this description whether they are open or closed, empty or filled, and comprehends the preferred method of making the container wherein the floating body is inserted prior to filling.

It has been ascertained that a floating body by reason of its buoyancy had a tendency to close the neck of the container until at least the first dose had been dispensed and in such a situation it was difficult to dispense the small quantity as quietly as desired. As a matter of fact, a large quantity may be discharged suddenly when the floating body moves away, thereby resulting in an undesired soiling of the surroundings.

The aforementioned undesirable characteristic has been overcome in the present invention by providing the upper and lower surfaces of the floating body with at least one projection for preventing the body from closing the neck whereby the initial small portion of liquid may be dispensed quietly.

Additional objects and advantages of the invention will become more readily apparent to those skilled in the art from the following detailed description and annexed drawings, in which drawings:

FIGS. 1 and 2 illustrate diagrammatically in longitudinal section, a bottle provided with a floating body in accordance with the invention in full and half empty conditions, respectively,

FIG. 3 is a diagrammatic view in longitudinal section of the bottle in FIGS. 1 and 2 during pouring,

FIG. 4 is a view in longitudinal section of an embodiment of a metallic bottle or can provided with a floating body in accordance with the invention,

FIG. 5 is a top view of the bottle shown in FIG. 4,

FIG. 6 is a view showing the corresponding floating body in axial section and on a slightly larger scale,

FIG. 7 is a top view of a further liquid container and floating body,

FIGS. 8 and 9 are top and cross-sectional views, respectively, of the corresponding floating body, and

FIG. 10 is a cross-sectional view of the same body in folded condition.

Referring to FIGS. 1 to 3, a bottle or container **1** may be fabricated of any suitable material convenient for the liquid contents and preferably the material should be such that can easily be shaped with narrow tolerances, as is the case with metals. At the top, the container is provided with an outlet through a narrow neck **5** closed by a screw-cork or in any other suitable manner. The shape of the container may be varied in many ways, provided it has substantially the same cross-section throughout most of the height and an outlet at the top, and care is taken that a floating body indicated at **3** is entrapped and at the same time freely movable within the container, and especially shoulder portion **4** thereof, which forms a transition to the discharge neck **5**, prevents the floating body or cover from being discharged with the liquid and from sticking by being wedged in the outlet.

The floating body **3** has a largely flat shape and follows the internal cross-section of the cylindrical part of the container with a slight clearance against the container wall. If the bottle has originally been filled to within the neck, the body **3** will from the outset be entirely submerged in the oil, but as soon as the small quantity of the oil above the body has been dispensed it will constitute a partition between the oil and air throughout practically the whole area, except for the clearance.

The body is provided with the same shape on its top and bottom surfaces so that it is immaterial which surface faces upwardly, and is rounded at the edges in order to be as freely movable as possible. It is also desirable to make the top surface, or both the top and bottom surfaces in the case of a symmetrical shape, convexly conical to permit any oil which may have come on top of the body during pouring to flow to the edges, and which effect is enhanced by the cohesion of the oil. Thus, in the case of a symmetrical shape, the thickness should decrease toward the edges. The average specific weight of the body may be adapted so that the portion of the body having the greatest diameter will be located precisely in the oil surface as indicated in FIG. 2. However, this is not essential as it is possible that due to adhesion and surface tension to achieve between the edge of the body and the inner face of the bottle a film which separates a small air space that might possibly exist therebeneath from the air volume above the body.

During pouring, the body 3 will, because of its buoyancy, constantly adopt a generally horizontal position in the oil surface as shown in FIG. 3, and at the same time be withheld by the shoulder portion 4, so that the oil is allowed to flow out freely under the floating body.

In order to obtain the necessary buoyancy of the floating body or cover 3 the same may be hollow or porous, provided that the pores do not extend therethrough. It may be made of a rigid material, such as a metal, consistent with the oil, and in such case must be inserted into the container before the latter receives its final shape (that is, before it is essential if it consists of several parts, or before the narrowing toward the outlet is formed). Furthermore, the body may be flexible so that it can be pressed together for insertion through the mouth and thereafter adopt its desired shape within the bottle.

As mentioned previously, to prevent the body 3 from closing the neck 5, the top and bottom surfaces are each provided with projections 6 and 7 which extend radially outward from the center of the body and which terminate inwardly a short distance from the peripheral edge of the body. Manifestly, such projections prevent the body from closing the neck 5 so that the initial small portion of oil can be poured quietly.

FIGS. 4 and 5 illustrate an embodiment of a metallic bottle or can 8 having a circular cylindrical shape throughout most of its height and which is composed of two parts. The bottle receives a hollow metallic floating body 9 of the shape shown in FIG. 6. In this form, the bottle consists of aluminum, and the body 9 may be of the same material. Also, the bottle has a screw-threaded neck 10 and a shoulder portion 11 constituting a transition from the container cross-section to the neck. The container has a bottom 12 flanged thereto, whereby the floating body 9 may be inserted into the container prior to the attachment of the bottom, although it is possible to flange the bottom onto a cylindrical container blank and insert the body 9 before the neck 10 and shoulder portion 11 are formed. Corresponding to the cylindrical interior shape of the container, the body 9 is circular and the slope toward the edges is provided by making the body convexly conical on both sides. The floating body is composed of two parts which are assembled by simply making one part 13 have such a tight frictional fit in the other part 14 that oil leakage is prevented. When the container is filled, the presence of the floating body will cause no difficulty since it will lie on the bottom as shown in FIG. 4 from the outset and gradually float upwardly during the filling operation. In the case of rapid filling, it will generally rise slower than the oil surface, but with a suitable clearance against the wall there is no danger that any air space will remain on the bottom side of the body, because of the conical shape of its bottom side. Thus, at the filling station the operations will be exactly the same as for a bottle without such a floating body.

Here again it will be seen that the outer surface of the parts 13 and 14 is each formed with projections 15 and 16 which function in the same manner as the projections 6 and 7 disclosed in FIGS. 1–3.

In FIGS. 7–10, a container 16 has an oblong cross-sectional shape which merges into an outlet neck 17 through a shoulder portion 18, and a floating body 19 has a corresponding oblong shape with clearance against the container wall. The exterior shape of the body is again substantially symmetric with respect to a central horizontal plane, but in order to have a slope sufficiently steep for permitting the oil to flow off easily, the top and bottom sides slope toward the two longitudinal edges of the body from a longitudinal ridge line 20. The body 19 is composed of two substantially wedge-shaped and mutually symmetric porous bodies 21, such as cork, held together by a casing 22 of metal, for example aluminum, which has been bent around the cork wedges separately, so that the body as a whole consists of two halves held together solely along the ridge 20 on one side. Therefore, the floating body is capable of being folded together about this line, as shown in FIG. 10, so that it can be inserted through the neck 17 in spite of the fact that in its normal condition it has a width greater than the diameter of the neck. After having thus been inserted to a position in which it rests on the bottom, it is possible by introducing a suitable tool through the outlet to press the body to its desired final shape as shown in FIGS. 8 and 9.

Each wedge-shaped body 21 is provided with projections 23 and 24 on its upper and lower surfaces so that when the body 19 is in the condition depicted in FIG. 9, the projections will prevent the body from closing the neck 17 to enable the initial small quantity of oil to be discharged in a quiet fashion.

Although it is possible to insert such a foldable floating body after the container has been filled, an insertion before filling is preferable for reasons of easy manufacture and of hygiene.

It is to be understood that although certain preferred embodiments of the invention have been described, many modifications are possible within the scope of the appended claims and without departing from the spirit and scope of the invention.

What is claimed is:

1. A filled packaging and dispensing container comprising a body portion, a restricted neck and a shoulder defining a transition between the body portion and neck, removable closure means on the neck, a quantity of medical oil filling the container and having its surface within the neck when the container is in an upright position, a float submerged in said oil and covering the interior cross-sectional area of said body portion except for a small clearance, whereby said float is withheld by said shoulder portion from floating to said surface, said clearance being sufficient to permit the float to move freely within said body portion on tilting movements of the bottle and, after a partial discharge of the oil, to float on the surface of the oil in upright and inclined positions of the bottle while at the same time being withheld by said shoulder portion so as to remain entrapped in the bottle without being wedged in the neck, said float comprising two portions interconnected along a fold line for permitting the insertion thereof through the restricted neck in folded condition and thereafter adopt its desired shape, the float having an elongated cross-sectional configuration and on either side a roof-like shape provided with a ridge extending in the longitudinal direction thereof for allowing any oil remaining on the top of the float after discharge to flow off to the edges.

2. A filled packaging and dispensing container comprising a bottle having a substantially cylindrical body portion, a restricted neck and a shoulder portion defining a transition between said body portion and said neck, removable closure means on said neck, a quantity of medical oil filling said bottle and having its surface within said neck when the bottle is in an upright position,

and a substantially disc-shaped float having opposite sides and a perimetric edge submerged in said oil and covering the interior cross-sectional area of said body portion except for a small clearance, whereby said float is withheld by said shoulder portion from floating to said surface, said clearance being sufficient to permit the float to move freely within said body portion on tilting movements of the bottle and, after a partial discharge of the oil, to float on the surface of the oil in upright and inclined positions of the bottle while at the same time being withheld by said shoulder portion so as to remain entrapped in the bottle without being wedged in the neck, the shape of said float being substantially symmetric about a horizontal plane and tapering towards the perimetric edge with an inclination permitting any oil that remains on the top of the float after discharge to flow off to the perimetric edge, and at least one projection on each side of the float having opposite end portions located inwardly of the perimetric edge for preventing the float from closing the neck until an initial small quantity of oil has been dispensed.

3. The container as claimed in claim 2 in which said body portion includes at least two permanently joined circular parts for permitting the float to be inserted into the container prior to joining without being deformed and said float being conical on each side and said projection includes ribs extending radially from the center of the float.

4. A filled packaging and dispensing container comprising a body portion, a restricted neck and a shoulder defining a transition between the body portion and neck, removable closure means on the neck, a quantity of medical oil filling the container and having its surface within the neck when the container is in an upright position, a float submerged in said oil and covering the interior cross-sectional area of said body portion except for a small clearance, whereby said float is withheld by said shoulder portion from floating to said surface, said clearance being sufficient to permit the float to move freely within said body portion on tilting movements of the bottle and, after a partial discharge of the oil, to float on the surface of the oil in upright and inclined positions of the bottle while at the same time being withheld by said shoulder portion so as to remain entrapped in the bottle without being wedged in the neck, said float comprising two portions interconnected along a fold line for permitting the insertion thereof through the restricted neck in folded condition and thereafter adopt its desired shape, the float having an elongated cross-sectional configuration and on either side a roof-like shape provided with a ridge extending in the longitudinal direction thereof for allowing any oil remaining on the top of the float after discharge to flow off to the edges, and at least one projection on each portion extending substantially perpendicularly to the fold line having an end located inwardly of the edges and adapted to prevent the float from closing the neck until an initial small quantity of oil has been dispensed.

5. A container for medical oils comprising a body portion, a restricted neck and a shoulder portion defining a transition between the body portion and neck, a float within the body portion covering the major part of the cross-section thereof and having opposite sides and a perimetric edge spaced slightly from the interior of the body portion to provide a clearance, said float being permanently entrapped by the shoulder portion and at the same time being freely movable within the body portion so that during dispensing of the oil the float remains flat on the oil surface and the oil flows freely from therebeneath through the neck, and at least one projection on each side of the float having opposite end portions located inwardly of the perimetric edge and adapted to prevent the float from closing the neck until an initial small quantity of oil has been dispensed.

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