Feb. 4, 1964 D. J. BUDDRUS 3,120,319

PROTECTIVE CONTAINER

Filed July 9, 1962

Fig. 1.

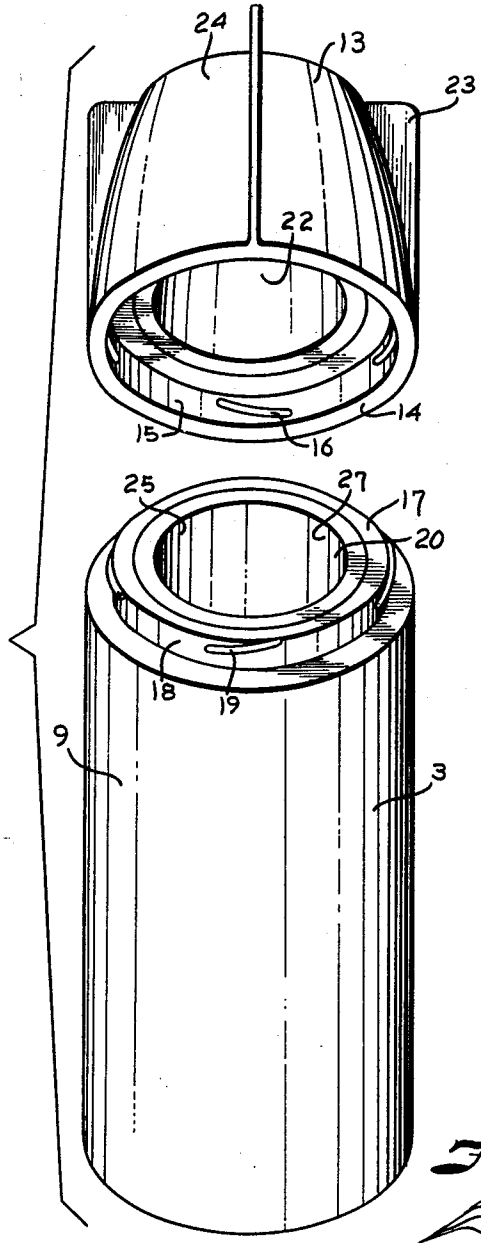


Fig. 2.

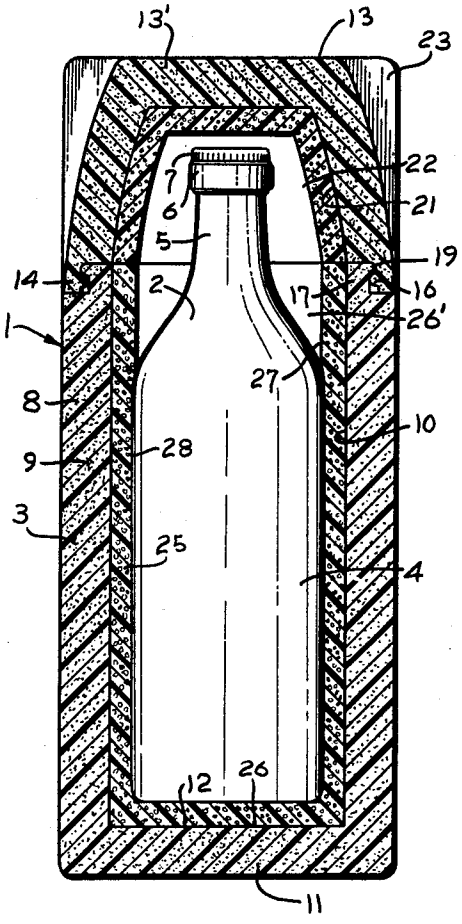
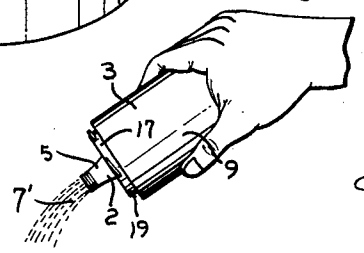


Fig. 3.



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PROTECTIVE CONTAINER

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This invention relates to protective containers and more particularly to containers for transporting fluids or other materials within glass bottles while protecting the bottles against breakage due to physical shock and the contained materials against rapid temperature fluctuations.

In transporting liquids or other materials from place to place, and particularly with medicinal and food preparations, it is often highly desirable that the materials be enclosed within glass walled containers to take advantage of the well known properties of cleanliness, inertness and low cost which glass offers. Glass containers, however, present the disadvantage of being brittle and thus requiring great caution in handling or the use of bulky packing substances. Also, with regard to materials which are heat sensitive, such as medicinals requiring refrigeration, glass walled containers rapidly conduct heat between the environment and the container contents.

Heretofore, insulating containers for bottles have been developed, however, such containers usually have interior chambers of much greater size than the bottles placed therein and thus, in absence of loose stuffing material or special cages, permits the bottles to move or rattle within the container. Such oversize chambers also, of necessity, result in containers of excessively large bulk and cost. A further disadvantage of container chambers larger than the bottle is that the bottle usually has to be completely removed therefrom for emptying the contents since the mere inversion of the bottle container with the lid thereof removed results in the bottle dropping out.

The principal objects of the present invention are to provide a lightweight physical shock resisting container assembly of minimum bulk for transporting material within glass enclosures; to provide such a container assembly which maintains the enclosed material protected against rapid heat transfer from the external environment; to provide such a container assembly which receives a bottle in a snug, cushion-like grip to prevent loose movement of the bottle within the container and permit emptying the contents of the bottle without removal of the bottle from the container; to provide such a container assembly which may be produced in a cost range sufficiently low to permit throw-away after a single use; to provide an inexpensive minimum bulk container assembly well adapted for preserving and transporting heat-sensitive medicinals, chemicals and food; and to provide such a device which may be easily mass produced.

Other objects and advantages of this invention will become apparent from the following description taken in connection with the accompanying drawings wherein are set forth by way of illustration and example certain embodiments of this invention.

FIGURE 1 is a perspective exploded view of a container assembly embodying this invention with the bottle removed therefrom and particularly illustrating partial threads for engaging a lid closure.

FIGURE 2 is a cross-sectional view taken longitudinally through the container assembly particularly illustrating the bottle snugly held in a cushion-like grip by a partially compressed resilient liner.

FIGURE 3 is a perspective view on a reduced scale illustrating the pouring of contents from the bottle without bottle removal from the container.

Referring to the drawings in more detail:

The reference numeral 1 generally indicates a lightweight temperature insulating shock resisting container assembly embodying this invention. The container assembly 1 includes a hollow glass enclosure or bottle 2 and a container 3 for receiving bottle 2. The bottle 2 in the illustrated example, has a cylindrical elongated lower body portion 4 and a reduced upper or neck portion 5. The neck portion 5 terminates at the upper end 6 thereof in a suitable removable cap 7 which engages the neck portion for sealing contents such as a medicinal or food compound 7' in the bottle 2. Depending upon the properties of the contents, the bottle 2 may be constructed of especially colored or compounded glass to provide the most desirable environment.

The container 3 for the bottle 2 has a side wall 8 forming an elongated hollow cylinder 9 exhibiting a substantially cylindrical interior surface 10. An end wall 11 is integral with the side wall 8 and forms a container closure at the lower end 12 of the hollow cylinder 9. A removable end member or cap 13, in the illustrated example, tapers inwardly as it extends upwardly and is comprised of a wall 13' having a thickness substantially the same as the side wall 8 and end wall 11. The end member or cap 13 has a depending integral ring portion 14 presenting an interior cylindrical surface 15 upon which is formed inwardly protruding spaced partial threads 16. The side wall 8 forming the hollow cylinder 9 has an upwardly extending integral ring portion 17 forming an exterior cylindrical surface 18 of slightly smaller diameter than the cylindrical surface 15 whereby the ring portion 14 is adapted to sleeve thereover. The cylindrical surface 18 has a plurality of outwardly protruding spaced partial threads 19 adapted to engage with the partial threads 16 of the ring portion 14 for threadedly securing the end member or cap 13 to the open end 20 of the hollow cylinder 9.

The end member or cap 13 is hollow in that it has an interior depression extending thereinto and defined by an inwardly facing surface 21 forming a partial enclosure 22 open at the lower end thereof. The interior surface 21 is adapted to coincide and provide continuity with the interior cylindrical surface 10 when the end member or cap 13 is engaged with the hollow cylinder 9, closing the container 3. Suitable radially extending members or wings 23 are provided on the exterior surface 24 of the end member or cap 13 for convenience in gripping the cap 13 to produce the relative rotation necessary for disengaging the threads 16 and 19.

The side wall 8 and end wall 11 and end member wall 13' are composed of lightweight substantially rigid closed cell structural insulating material such as expanded polystyrene. Such material has the properties of a good insulator and is easily formed in inexpensive molds. It is noted that in molding expanded polystyrene a skin is normally formed on the surfaces contacting the mold which is tougher than the interior or body of the material and tends to resist rough handling and abrasion.

Liner material 25 is of substantially constant thickness when uncompressed and covers the side wall interior surface 10 and the inwardly facing surface 26 of the end wall 11 and the inwardly facing surface 21 of the end member or cap 13 defining an enclosed chamber 26' when the cap 13 is engaged with the cylinder 9. The liner material 25 is composed of a compressible resilient foam-like material such as polyurethane foam which has connected cells, and though the material 25 is not considered as good an insulator as the closed cell material (foamed polystyrene), it has good insulating characteristics. The liner material 25 is secured by any suitable adhesive and serves mainly but not solely for its cushioning and gripping capacity as noted hereinafter.

The inside surface 27 of the liner material 25 which covers the side wall interior surface 10 forms a cylindri-

cal sleeve 28. When the liner material 25 forming the sleeve 28 is uncompressed, the sleeve 28 is slightly less in diameter than the outside diameter of the bottle body portion 4, FIGURE 2. The sleeve 28 receives the bottle 2 with the neck 5 extending toward the end member or cap 13. The bottle body portion 4, in the illustrated example, maintains a major part of the liner 25 forming the sleeve 28 deformed in a compressed condition against the interior surface 10 whereby the bottle 2 is snugly held in a cushion-like grip. Thus the bottle 2 and contents thereof are well protected against external shocks experienced by the assembly 1 and any ingredients contained in the bottle 2 are protected against rapid temperature changes either up or down caused by heat transfer to or from the environment. Efficient heat insulation is provided by the double wall composed of closed cell rigid material and resilient material.

When it is desired to empty the contents of the bottle 2, the end member or cap 13 is removed by a partial relative rotation with respect to the hollow cylinder 9, the bottle cap 7 removed, and the container 3 with the bottle therein merely inverted as illustrated in FIGURE 3. Due to the cushion-like grip of the liner material 25 the bottle 2 is retained against separation from the hollow cylinder 9 and thus the bottle 2 need not be subjected to the risk of breakage by handling when separate from the protective container. However, the bottle 2 is easily removed by withdrawal if so desired.

It is to be understood that while one form of this invention has been illustrated and described it is not to be limited to the specific form or arrangement of parts herein described and shown except insofar as such limitations are included in the claims.

What I claim and desire to secure by Letters Patent is:

1. In combination, a light-weight container and fragile bottle:

(*a*) said container including a side wall having an interior surface with oppositely disposed ends, an end wall engaged with said side wall and forming a container closure at one end of said interior surface, a removable end member engaged with said side wall and forming a container closure at the other end of said interior surface,

(*b*) said side wall being composed of substantially rigid structural material,

(*c*) a liner covering said side wall interior surface, said liner being composed of compressible resilient foam-like material,

(*d*) the inside surface of said liner when said liner is uncompressed defining a space slightly less in dimension than the outside surface of said bottle and slidably removably receiving said bottle thereagainst,

(*e*) said bottle having a pouring mouth adjacent said other end and maintaining a part of said liner covering said side wall deformed in a compressed condition against said interior surface of said side wall producing a cushion-like retaining grip on said bottle,

(*f*) whereby said bottle is protected against external shocks and said container may be inverted for pouring contents out of said bottle without movement of said bottle relative to said container and without obstruction to said relative movement except by said retaining grip.

2. The container assembly of claim 1 wherein:

(*a*) said side wall inside surface and bottle outside surface are cylindrical.

3. The container assembly of claim 1 wherein:

(*a*) said side wall structural material is an insulating material such as expanded polystyrene.

4. The container assembly of claim 1 wherein:

(*a*) said liner is an insulating material such as polyurethane foam.

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