

[54] **PACKAGE FOR HOLDING
PRESSURIZED FLUENT MATERIALS**

[75] Inventor: **Robert L. Doughty**, West Hartford,
Conn.

[73] Assignee: **Monsanto Company**, St. Louis, Mo.

[22] Filed: Dec. 28, 1970

[21] Appl. No.: 101,961

[52] U.S. Cl.....215/1 C, 99/171 B, 215/12 R,
220/69

[51] Int. Cl. B65d 23/00

[58] **Field of Search**.....215/1 C, 1 R, 12 R,
215/13 R, DIG. 6; 220/67, 68, 69; 222/183,
184; 156/69, 293, 294; 264/248, 249; 99/171
B

[56] **References Cited**

UNITED STATES PATENTS

3,426,102	2/1969	Socak et al.	206/DIG. 34
2,211,102	8/1940	Davis.....	156/293
3,377,348	4/1968	Subocz.....	264/248

3,482,724	12/1969	Heaton	215/12 R
3,247,302	4/1966	Lewis	264/248
2,077,216	4/1937	Conner	215/13 R
3,419,297	12/1968	Diepenhurst et al.	264/249

FOREIGN PATENTS OR APPLICATIONS

1,175,048	12/1969	Great Britain.....	215/1 C
-----------	---------	--------------------	---------

Primary Examiner—Samuel B. Rothberg

Assistant Examiner—Stephen Marcus

Attorney—James C. Logomasini, Michael J. Murphy and Neal E. Willis

[57] **ABSTRACT**

A composite package for holding pressurized fluent materials such as carbonated beverages, beer, aerosols and the like, which includes a thermoplastic container having a hemispherically shaped bottom section and a support for holding the container in an upright position which is formed of a thermoplastic compatible with that of the container, the support being heat sealed to the bottom section so as to attach the two together.

4 Claims, 3 Drawing Figures

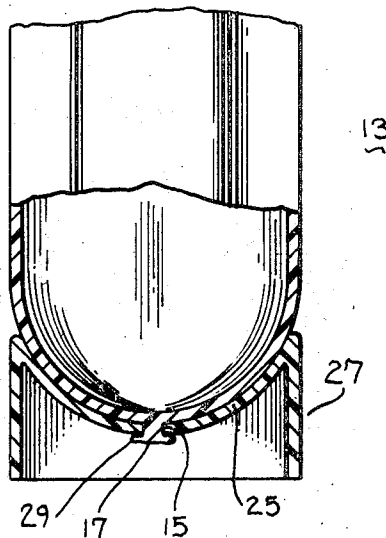


FIG. 1

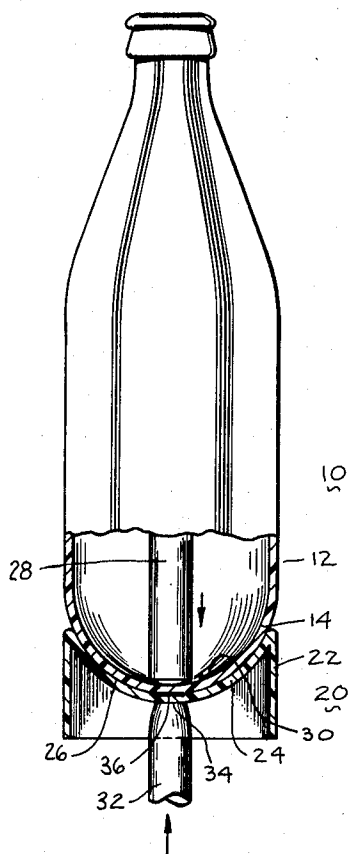


FIG. 2

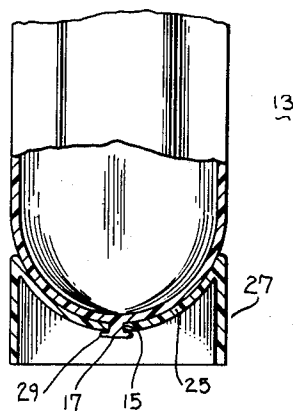
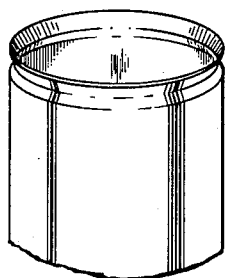


FIG. 3



14

INVENTOR
 ROBERT L. DOUGHTY
 BY *Michael J. Murphy*
 ATTORNEY

PACKAGE FOR HOLDING PRESSURIZED FLUENT MATERIALS

BACKGROUND OF THE INVENTION

This invention relates to a composite package and more particularly to a composite package for holding pressurized fluent materials.

Thermoplastic containers for holding pressurized contents have been appearing recently in the prior art. Such containers are desirable since, generally speaking, they are relatively break resistant, light in weight and readily destroyed after use. However, the materials from which such containers are made are rather special in the sense of having to possess a large number of characteristics necessary to accommodate these rather difficult to package contents. Accordingly, such special materials are costly to synthesize and therefore the amount of material used in each container should be the minimum necessary to permit the container to function satisfactorily, if a profit is to be realized in the highly competitive plastic packaging industry.

To contain the pressure of the contents, one prior art approach has been to make the container wall thicker but, as mentioned, this is uneconomical. Another approach is to design the container so as to minimize areas of high stress concentration and thus avoid the need for extra material in such areas. As is generally known, the area of highest stress concentration in an elongated container under pressure is in the bottom section along the general area of the confluence of the sidewall with the base. As is also generally known, a base section in the form of a hemisphere takes maximum advantage of the strength of the material from which the container is constructed, since the surface area of such a shape per unit volume is smaller than that of any other base design. Such a hemispherical configuration for a container is disclosed in U.S. Pat. No. 3,480,168. Unfortunately, such a container configuration is incapable of supporting itself on an upright position on a horizontal surface and requires some auxiliary means such as the integrally formed feet illustrated in the referenced patent. Such feet, however, though providing some support when accurately shaped, would appear to require rather radical departures from conventional molding techniques to form them. Also, they serve to support the container at only a few points around its periphery. In copending application Ser. Nos. 75,095 and 75,096, each filed on Sept. 24, 1970, and assigned to the assignee of the present invention, the latter now abandoned, a similar container is shown wherein a separate support member is described which is snapped into a mating depression in the container base or vice versa. Though such a configuration would appear to function satisfactorily, the departure of the base section from a truly hemispherical shape, which is necessary to accommodate the support member, detract from the optimum configuration to the extent that such surface protrusions act as stress concentration points in the container base.

SUMMARY OF THE INVENTION

Now, however, there has been discovered a new form of package which overcomes the aforementioned deficiencies of the prior art.

Accordingly, it is a principal object of this invention to provide an improved composite package for holding

pressurized fluent materials such as beer, carbonated beverages, aerosols and the like.

Another object of this invention is to provide a package of the aforementioned variety wherein the container is provided with a base configuration which minimizes areas of high stress concentration.

A further object of this invention is to provide a package of the aforementioned variety wherein the container has an unmodified hemispherical base configuration and is provided with support means for keeping it in an upright position on a flat surface.

An additional object of this invention is to provide a package of the aforementioned variety which can be readily formed by conventional molding techniques without the need for any radical change in molding equipment or in the forming process.

Other objects of this invention will in part be obvious and will in part appear hereinafter.

These and other objects are accomplished by providing a composite package for holding pressurized fluent materials comprising a one piece thermoplastic container having a substantially hemispherically shaped bottom section to minimize stresses generated thereon by said fluent materials, and means for supporting the container in an upright position, these means being formed of a thermoplastic which is compatible with that of the container, said supporting means being heat sealed to the bottom section so as to join the two together.

BRIEF DESCRIPTION OF THE DRAWINGS

In describing the overall invention, reference will be made to the accompanying drawings wherein:

FIG. 1 is a vertical sectional view of one form of the package of the present invention illustrating the manner of attaching the support means to the container;

FIG. 2 is a schematic view of the bottom portion of an alternative form of the package of FIG. 1; and

FIG. 3 is a perspective view of a portion of an alternative form of container usable as a part of the package of the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Referring now to the drawing, there is illustrated in FIG. 1, a composite package for holding pressurized fluent materials and generally indicated as 10. Package 10 comprises a cylindrical thermoplastic container 12 preferably formed by conventional molding techniques such as by expansion of a tubular parison within closed sections of a partible blow mold. Container 12 is illustrated in FIG. 1 in the form of a narrow necked bottle wherein the size of the opening at the upper end of the sidewall is between 20 to 40 percent of the largest diameter of the body. Alternatively, however, container 12 may be in the form of a wide mouth can wherein the diameter of the opening through which the contents is dispensed is basically that of the remainder of the sidewall, as illustrated by 14 in FIG. 3. It should be understood, however, that the size of the container outlet may also be intermediate that shown in FIGS. 1 and 3, as desired. Container 12 is of one piece construction and is formed of a thermoplastic having sufficient strength to withstand pressures of from 20 to 200

psi at wall thicknesses of from 10 to 50 mils. Such thermoplastics are known and include polymers of vinyl chloride, and those wherein a major constituent therein has been formed from a nitrile group containing monomer. Container 12 has a substantially hemispherically shaped bottom section 14, which, because of its configuration, minimizes stresses generated thereon as a result of the pressure of the contents.

As a further part of package 10, there is provided a support 20 for holding container 12 in a vertical position on a horizontal surface. Support 20 includes a substantially vertical sidewall 22 and a continuous, concave end wall 24 in intimate contact with substantially all of the outer surface 26 of hemispherical bottom portion 14. Support 20 is formed of a thermoplastic which, from the standpoint of melt bonding, is compatible with the thermoplastic of the container 12.

To assemble container 12 to support 20, the container is placed on the support such that hemispherical bottom 14 and end wall 24 are concentric with each other and are in surface to surface contact. Upper supporting anvil 28 is then inserted into container 12 through its open upper end and pressed against the inner surface 30 of base 14 on the axis of container 12 while lower heat sealing anvil 32 is brought up from beneath within sidewall 22 in alignment with upper anvil 28 so as to press end wall 24 against bottom 14.

In an alternative form of the invention (FIG. 2) bottom section 4 may have a nub 15 extending outwardly therefrom on the axis of cylindrical container 12. Though nub 15 is of a relatively small size, for example between one thirty-second to one-fourth inch in length and one-sixteenth to one-fourth inch in diameter, satisfactory results may be obtained when nub 15 is in the form of a portion or all of the tail section conventionally formed in a blow molding operation when the leading end of a thermoplastic parison is clamped between partible mold sections. When the package is in assembled condition nub 15 has a head portion 17 which is greater in cross section than the remainder of nub 15. End wall 25 of support 27 in FIG. 2 has an aperture formed therein through which nub 15 projects. This aperture has a cross section which is less than that of nub head portion 17 such that head portion 17 surrounds the aperture when the package is in assembled condition.

The container 13 illustrated in FIG. 2 is assembled to its support in the same manner as that illustrated in FIG. 1, except that nub 15 serves to center the container on support 27 via initial insertion through the aperture in the end wall 25 thereof. The support and heat sealing mandrels are kept in contact with the

hemispherically shaped bottom and projecting nub until head portion 17 is formed and is heat sealed at 29 to end wall 25.

To avoid the heat sealing surface sticking to nub 15 or to the surface of the end wall of the support during sealing of the container and support, it may be necessary to coat it with a release agent such as teflon. Though it is not necessary for purposes of the invention that the container and support be made of the same thermoplastic, it is essential that the thermoplastics be sufficiently compatible as to permit formation of a melt bond or weld type of seal formed under heat sealing conditions of elevated temperature and pressure. One or the other or both of the surfaces to be sealed may, if desired, initially have a heat sealing type of coating applied thereto to facilitate formation of the joint.

The above description and particularly the drawings are set forth for purposes of illustration only and are not to be taken in a limited sense. Various modifications and alterations will be readily suggested to persons skilled in the art. It is intended, therefore, that the foregoing be considered as exemplary only and that the scope of the invention be ascertained from the following claims.

What is claimed is:

1. A composite package for holding pressurized fluent materials comprising:

a. a one piece, elongated thermoplastic container having a substantially hemispherically shaped bottom section to minimize stresses generated thereon by said fluent materials, said bottom section having a projection thereon extending away from the container;

b. means for supporting said container in an upright position, said means being formed of a thermoplastic which is compatible with the thermoplastic of said container, said means including an end wall having an aperture therein through which said projection extends, said supporting means being heat sealed to said projection in the area of the end wall adjacent said aperture.

2. The package of claim 1 wherein said projection is on the axis of said container and is between one-sixteenth to one-fourth inch in diameter.

3. The package of claim 2 wherein said projection has a head portion of greater diameter than the aperture in the end wall of the supporting means.

4. The package of claim 1 wherein the thermoplastic forming the container includes as a major constituent thereof, a polymerized nitrile-group-containing monomer.

* * * * *