Oct. 28, 1969 D. B. MARIS 3,474,843

BLOW-MOLDED CONTAINERS

Filed Aug. 28, 1967 2 Sheets-Sheet 1

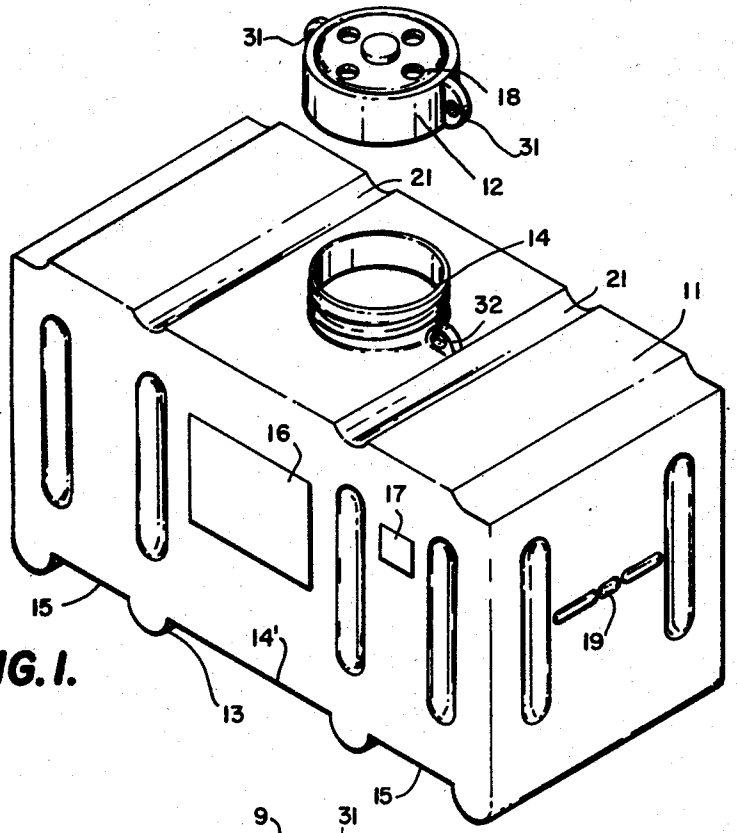


FIG. 1.

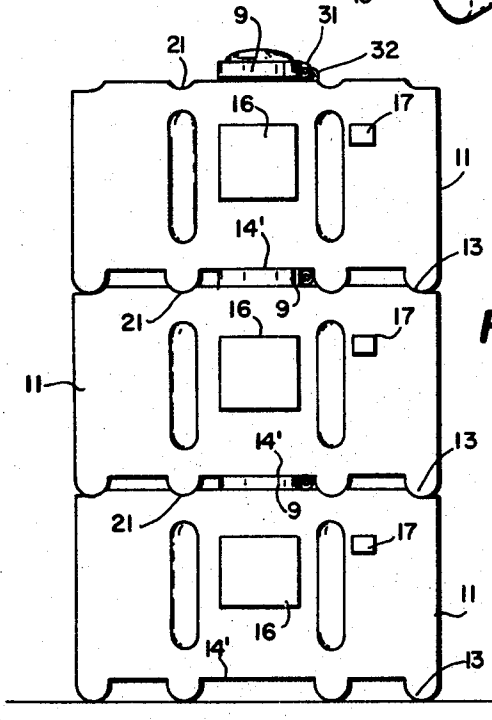


FIG. 2.

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FIG.3.

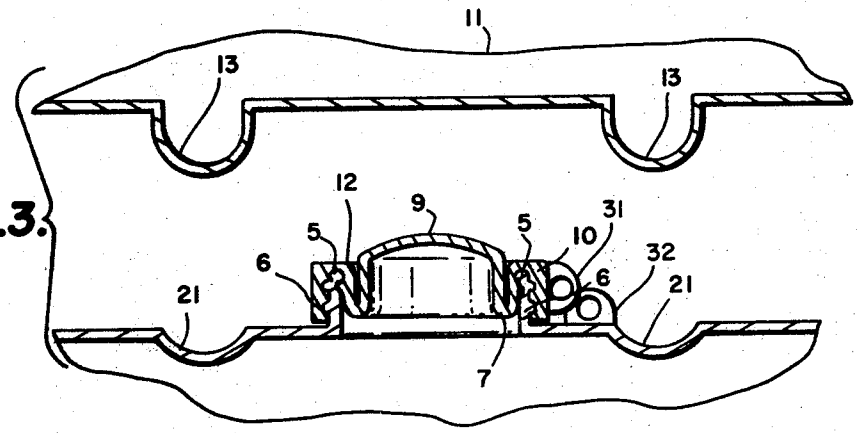


FIG.4A.

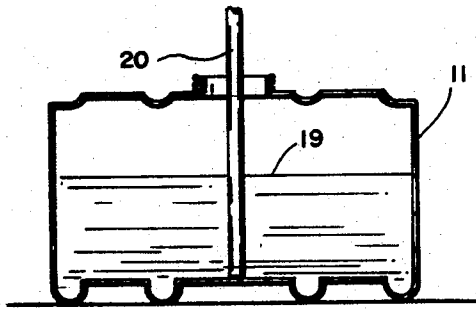


FIG.4B.

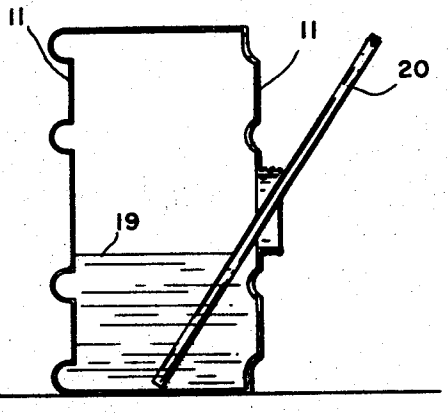
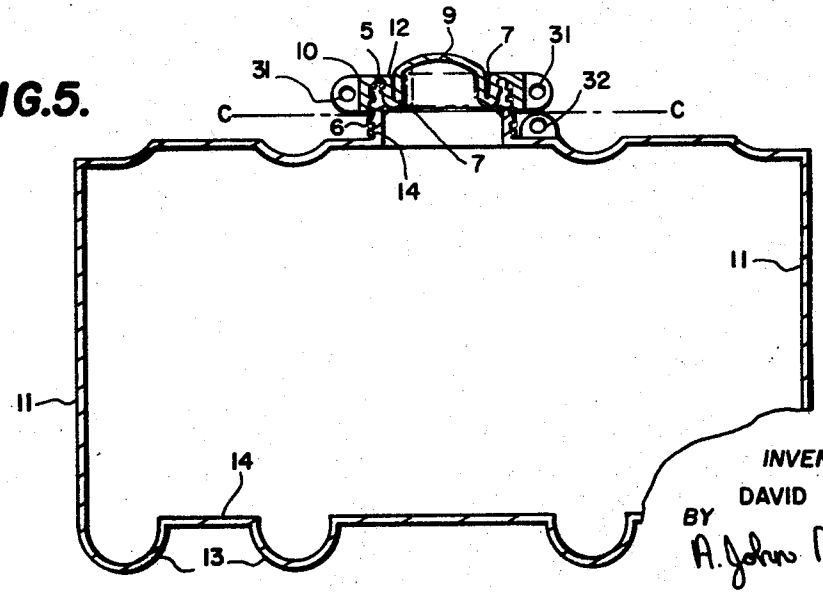


FIG.5.



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BLOW-MOLDED CONTAINERS

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U.S. Cl. 150—.5 1 Claim

ABSTRACT OF THE DISCLOSURE

A relatively large-size, blow-molded plastic shipping and stacking container having a high strength to weight ratio, comprising a body portion having substantially rectangular bottom, side and top portions, closure and opening means in said top portion, said closure means comprising a convex center portion which is adapted to expand outwardly against the inner wall of the container neck when subjected to external pressure, thereby effecting a tight seal. The required pressure is furnished by the weight of a superposed container which is stacked upon the bottom container, the pressure or weight being applied to said expansible convex center portion.

This invention relates to blow-molded containers, and more particularly to such a container having a very high ratio of strength to weight in one piece.

The plastics industry, both raw material producer and end user, have for years had to use a very large double walled container which required a lid, a wooden skid, glue to attach the cardboard to the skid, a plastic bag inside to protect the material from moisture, and steel banding to hold the apparatus together. In addition, the user has to purchase expensive apparatus to tip this very large container to assure that the raw material gathers in one corner thereof for pneumatic or other type of unloading.

Furthermore, the containers prior to this invention, being made of a wettable material, must be warehoused in a dry place to prevent disintegration by the elements and total loss of the product therein, and after use, are generally disposed of as junk, thus representing a loss to raw material producer and end-user.

Such conventional containers weigh from 50 to 55 pounds net weight and must be printed for identification of producer and labeled to identify the contents. Such constructions have proved to be very expensive to the end-user, as its costs must be passed along to the end-user in the price of the material therein contained.

Accordingly, it is an object of this invention to provide a blow-molded one piece container which will eliminate all of the afore-mentioned assembly, glueing, skids, banding, plastic liner bags, printing and labeling.

It is a further object of this invention to provide a container that can be warehoused in the outside weather without damage to container contents.

The present invention provides a container which, being lighter in weight, offers significant freight savings considering the number of units shipped and as a bonus to the end-user can be reclaimed at his plant and be remolded rather than junked, thus providing vast monetary savings per year.

The present container is so constructed that the tipping apparatus required in the case of the prior art containers will be eliminated.

The present invention provides a blow-molded, one piece plastic container with built-in skids, having a nestable depression in the top to receive the skids of the next container, and having a threaded opening. The threaded opening is beaded to receive a closure, said closure being designed to be screwed onto the opening and being provided with a convex center portion which deforms against the opening wall under the weight of the next stacked

container, thus providing an interference fit and a positive seal when assembled. Furthermore, the molded container portion and the closure sections have tabs molded into the parting line to provide a tamper-proof seal to be installed at the time of filling. Also, the container has molded-in logo, and label areas, eliminating printing and label attachments.

In accordance with another feature of this invention, the container can be emptied to a predetermined level, which is visible due to the translucency of the container material, and turned on its end to accomplish complete emptying of its contents. Advantageously, the closure is so molded as to have depressions to receive a spanner wrench for positive closing.

In the drawings:

FIGURE 1 is an exploded view of a blow-molded container and closure constituting embodiments of this invention;

FIGURE 2 is a view of several of the containers stacked one on top of the other;

FIGURE 3 is a sectional view of the closure portion illustrating the mechanical and tamper-proof seal;

FIGURES 4A and 4B show sectional cuts of the container in regular and tipped positions, respectively;

FIGURE 5 is a sectional view of the container as molded, showing the line C—C which separates the closure from the container.

Referring now to the drawings, there is shown in FIGURE 5 a sectional view of a blow-molded generally rectangular hollow container **11**, having opening and closure portions of different diameters. The body **11** with opening **14** is separated along the line C—C into two portions adapted to serve as a container with a threaded opening **14** and a closure or cap **9**.

The neck or opening portion **14** has a peripheral shoulder or bead **5** and a threaded portion **6**. The closure or cap **12** has threads of a diameter slightly larger than opening threads **6** and both threads have an under cut buttress profile. The cap **9** has a downwardly extending peripheral locking ring or sleeve **7** which provides a receptacle space **10** for peripheral shoulder **5**, so that when assembled as shown in FIGURE 3 a substantially permanent interlocking frictional seal is made between opening and closure. Furthermore, the closure has a convex top **9** which when assembled as in FIGURE 3 and when a loaded container **11** is placed on top of said closure as in FIGURE 2, the convex top assumes a flat shape, forcing the inwardly extending locking ring **7** against the inner surface of shoulder **5**, thus providing a further frictional fit of the closure with opening **14**. In addition to this feature, there are molded into the opening **14** and the closure on lid **12**, along the parting line of the molded part, two compression molded tabs **31** and **32** which provide holes to receive a tamper-proof seal.

Referring to FIGURE 1, there is shown an exploded view of the container **11** and closure **12**. The bottom of container body **11** has molded-in skids **13** and its top has corresponding nesting depressions **21** in such a manner that there is provided a positive lock-in for recesses **14'** which thus perform the sealing of concave closure top **9** shown in detail in FIGURE 3. Upwardly formed sections **15** are provided to receive fork lift or other lifting apparatus for moving the container. On either side of container **11** there are a molded-in logo section **16** and a similar label section **17** for writing directly onto the container.

The closure or lid **12** has provided therein spanner wrench depressions **18** molded therein. Referring now to FIGURE 2, several containers **11** are shown in a stacked position illustrating the effectiveness of skids **13** fitting into nesting depressons **21** and showing how the recess **14'** fit upon and effecting a tight seal as described above.

FIGURE 4A illustrates a container **11** at the end-user's facility where raw material is being unloaded by pneumatic or other means **20**, such material having assumed a level **19**, premarked as a molded-in line **19**, (FIGURE 1).

FIGURE 4B illustrates the container **11** tipped in an on-end position thus concentrating the raw material in an area to be picked up by unloading device **20**.

As previously stated, the production of the container and closure of this invention starts with blow molding. The blow-molding process is relatively inexpensive, as it requires a considerably less expensive mold than the injection molding process or other processes. Furthermore, the container must be molded in one piece to have the proper strength, which could not be accomplished by other systems. In addition, the blow molding process can produce various shapes and sizes of containers, however it is most desired to produce the container in sizes most suitable to the plastics industry for packaging polyethylenes, polypropylenes, acrolonitrile-butadiene-styrenes, cellulose acetate bytrates, vinyls and the like. Since the blow molding process is suitable to produce rectangular shapes, shapes such as cubes, cylinders and a number of poly gonal shapes can be produced. Furthermore, the walls of the container can be provided with corrugations, ribbing, fluting, basket weaves or the like.

Of the family of thermoplastics, any blow moldable material may be used for fabricating containers in accordance with this invention. Of the plastics family typical selections would be polyethylene, polyethylene copolymers, polypropylene, polystyrene and mixtures thereof, copolymers of ethylene and propylene, mixtures of polyolefins and polyvinyl halides. However, the material to be used will be dictated in part by the contents that are to be placed in the container.

While the afore-described container is especially suited to pelletized or powdered plastics as raw materials, other materials may be packaged therein such as food stuffs, powdered materials, chemicals, adhesives and the like.

What is claimed is:

1. A blow-molded plastic shipping and stacking container having a high strength to weight ratio, and comprising a body portion having substantially rectangular bottom, side and top portions, closure and opening means in said top portion, said closure means comprising a resilient convex center portion which is adapted to expand outwardly when subjected to external pressure, said bottom portion being formed with a plurality of skid-like leg portions projecting downward from said bottom, said

body portion also being formed at the rectangular top end thereof with a plurality of parallel elongated recesses adapted to securely receive and hold said leg portions when said container is stacked one upon another container, a plurality of elongated recesses formed into the base of said container between said leg portions, at least two of said recesses being adapted to receive power lifting means such as fork lift, a central recess formed into the base of said container, said central recess being adapted to receive the closure and opening means of a container upon which it is stacked, the height of said recess being so dimensioned that perpendicular pressure is exerted upon said closure means when one container is stacked upon another container, an annular discharge neck integral with the top portion of said container, said neck being screw-threaded and a peripheral shoulder or bead being formed into its discharge end, a closure or cap to fit upon said discharge neck and having threads adapted to fit the threads in said neck portion, a downwardly extending peripheral locking ring or sleeve formed into said closure or cap, said ring being adapted to receive said peripheral shoulder or bead, said closure being adapted, when subjected to the weight of a superposed container, to push said locking ring radially outward to a position engaging the inner periphery of the container opening in a manner to form a tight seal therewith.

References Cited

UNITED STATES PATENTS

D. 201,398	6/1965	Burns	220—97 X
1,786,826	12/1930	Cooper	220—39
2,235,617	3/1941	Klinzing	220—39
3,110,411	11/1963	Golde	220—39
3,128,016	4/1964	Ferri	222—143 X
3,176,879	4/1965	Mojonner	222—143
3,189,072	6/1965	Starr	150—0.5
3,282,461	11/1966	Beesley	220—21
3,298,415	1/1967	Klygis	150—0.5
3,361,290	1/1968	Matthews	150—0.5 X
3,381,845	5/1968	MacDonald	215—44 X

FOREIGN PATENTS

751,244	8/1933	France.

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215—10, 44; 220—46, 97