United States Patent

Goodrich et al.

[15] **3,638,835**

[45] **Feb. 1, 1972**

[54] COLLAPSIBLE SANITARY CONTAINER

[72] Inventors: **Eugene E. Goodrich**, 819 S. Western Ave., Park Ridge, Ill. 60068; **Paul J. Daniels**, 880 Siesta Drive, Sarasota, Fla. 33581

[22] Filed: **Oct. 29, 1969**

[21] Appl. No.: **872,276**

Related U.S. Application Data

[62] Division of Ser. No. 702,257, Feb. 1, 1968.

[52] **U.S. Cl.** **222/107**, 222/183, 150/1

[51] **Int. Cl.** **B65d 25/16**

[58] **Field of Search** ..... 150/0.5, 1; 229/41 A, 41 B, 229/14 B; 222/106, 107, 183; 217/8, 9; 215/1 C

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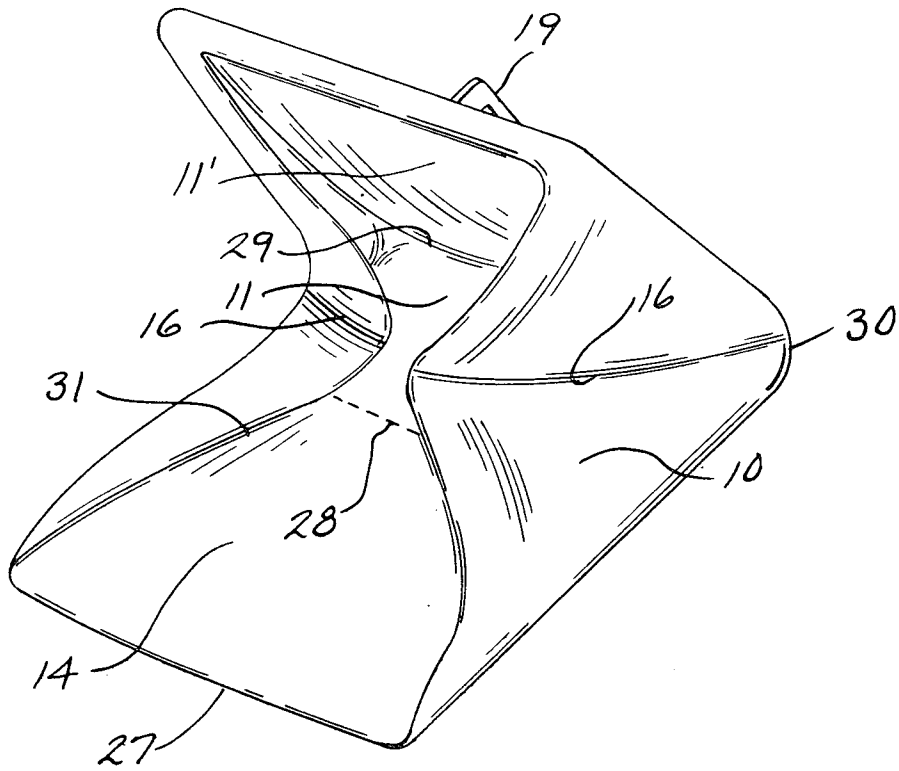
Primary Examiner—Robert B. Reeves
Assistant Examiner—Thomas E. Kocovsky
Attorney—Morsell & Morsell

[57] **ABSTRACT**

A generally rectangular polyethylene container for liquids such as milk having a retractable spout with spaced annular supporting ribs and adapted to be folded to collapsed condition and sealed promptly after manufacture, the material being so constructed and of such nature as to permit said folding but having sufficient strength that the container may be suspended from one of the supporting ribs of the spout prior to filling so that it may be filled without bottom support, the container being automatically opened out by the filling process and being self-supporting when filled with liquid.

4 Claims, 7 Drawing Figures



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SHEET 1 OF 2

Fig. 1

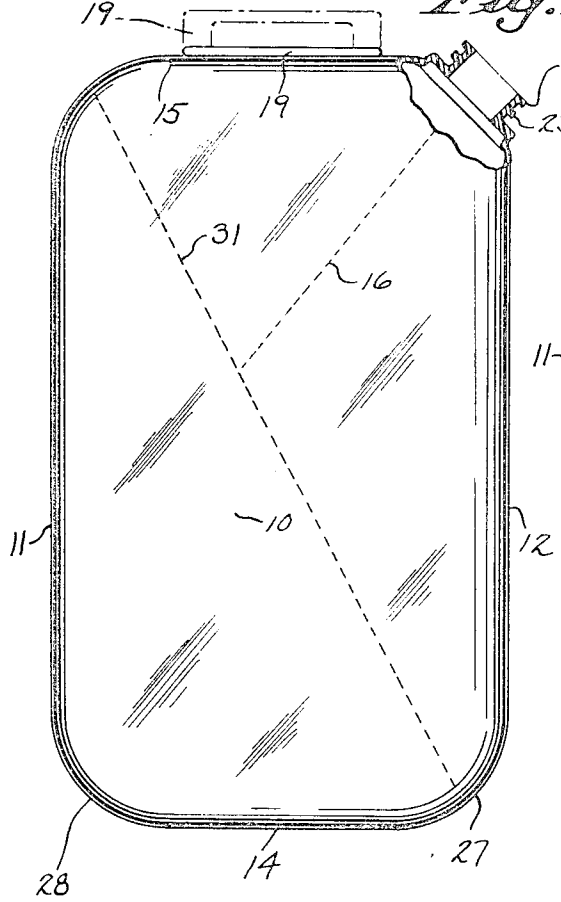


Fig. 2

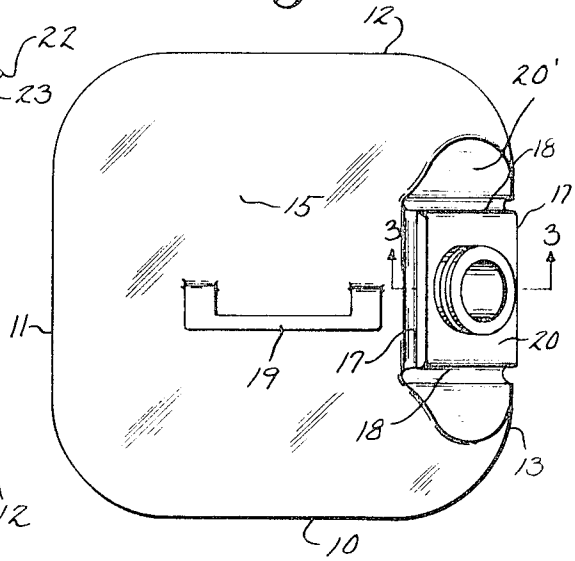


Fig. 3

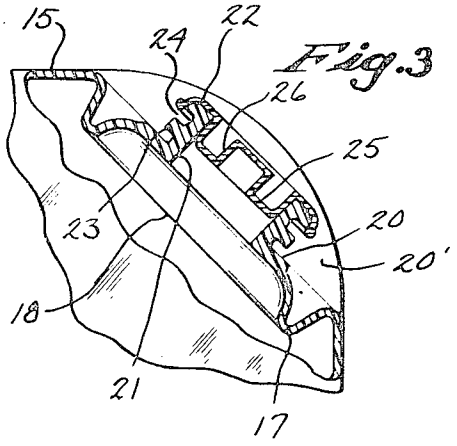
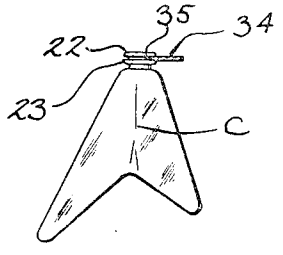


Fig. 7



INVENTORS
Eugene E. Goodrich
Paul J. Daniels

by Mosell & Mosell
ATTORNEYS

Fig. 4

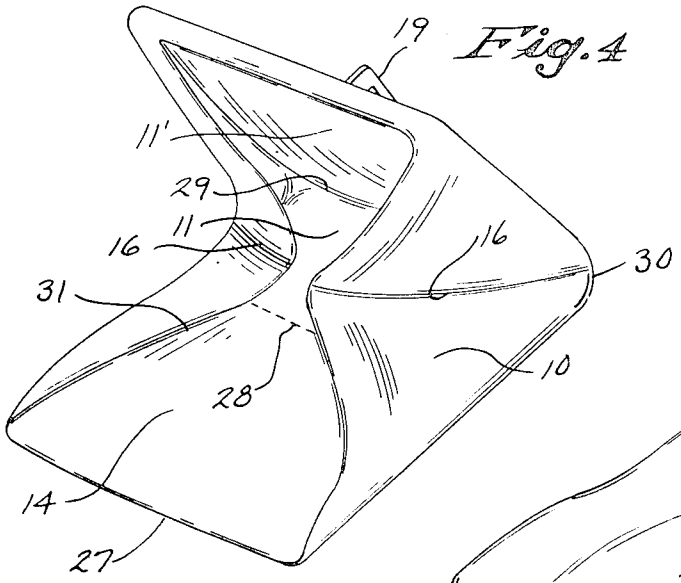


Fig. 5

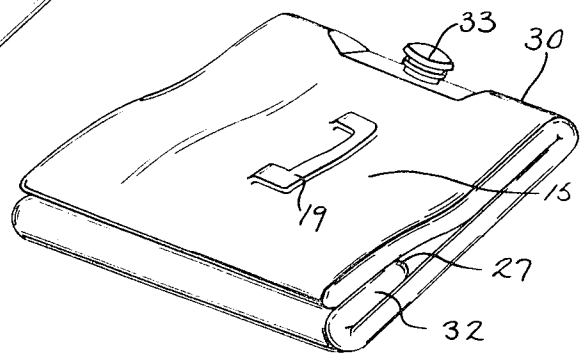
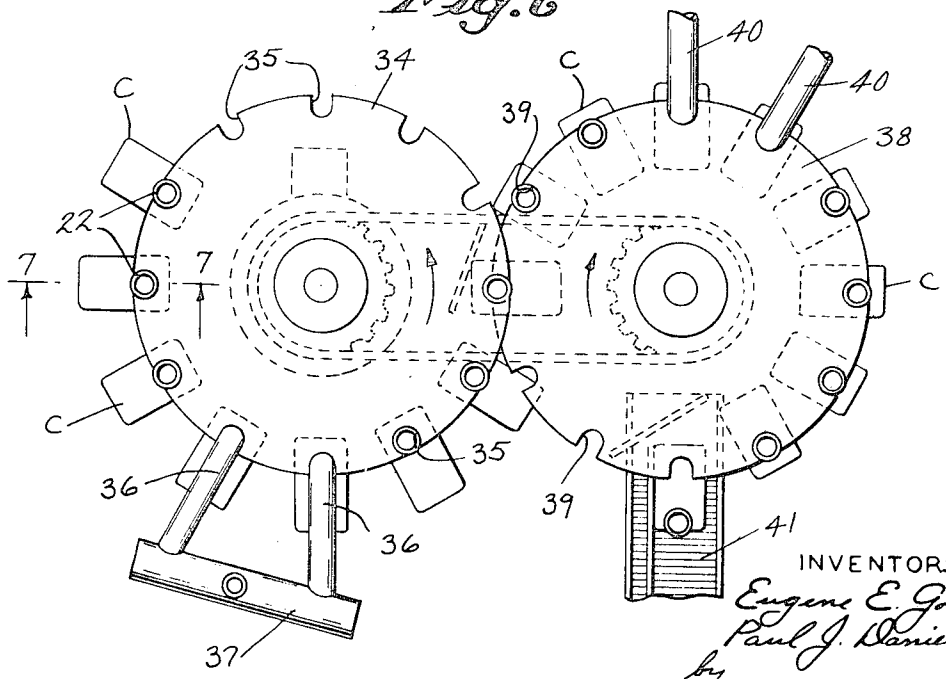


Fig. 6



INVENTORS
Eugene E. Goodrich
Paul J. Daniels
by
Morsell & Morsell
ATTORNEYS

COLLAPSIBLE SANITARY CONTAINER

This application is a division of application Ser. No. 702,257, filed Feb. 1, 1968.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention, while suited for use with a variety of liquids, is particularly adapted for dairy use to provide a single-service, throwaway type of milk container which may be used in homes and in milk dispensers of the type commonly employed in restaurants.

2. Description of the Prior Art

Heretofore milk has been delivered by the dairy to restaurants, institutions, or the like, for use in milk-dispensing machines, either in metal milk cans or, more recently, in relatively thin plastic bags within a supporting carton of fiberboard or the like. The metal milk cans are objectionable as they must be rehandled when empty, and thoroughly cleaned and sanitized at the dairy before being again used. The relatively recent thin plastic bag reinforced by an external carton eliminates some of the problems connected with metal milk cans, but the supporting cartons are expensive and the relatively thin plastic containers can only be filled while standing on an undersupport within the supporting fiberboard carton into which they must be manually inserted. This slows up the process and generally increases the expense connected with the packaging of milk in this manner.

SUMMARY OF THE INVENTION

The present invention provides a single-service, throwaway type of milk container which completely eliminates the need for rehandling and cleaning at a dairy, and eliminates the need for any supporting carton.

A further object of the present invention is to provide a plastic container so constructed and shaped that it may be folded to collapsed condition after manufacture, the container having a spout which is retractable to a nonprojecting position during shipment.

A further object of the invention is to provide a container as above described in which the spout is so formed that the container may be suspended from the spout in a filling machine to eliminate the necessity of an undersupport during filling, the plastic material being of sufficient thickness and strength as to permit such suspension, with the containers being self-opening during filling and self-supporting when filled, whereby the need for an outside carton is eliminated.

With the above and other objects in view, the invention consists of the improved collapsible sanitary container and all of its parts and combinations, as hereinafter set forth, and all equivalents thereof.

BRIEF DESCRIPTION OF THE DRAWING

In the drawing, in which the same reference numerals designate the same parts in all of the views:

FIG. 1 is a side elevational view of the improved container when filled, the dotted lines indicating approximate fold lines during collapse;

FIG. 2 is a top view thereof;

FIG. 3 is a fragmentary sectional view taken on the line 3—3 of FIG. 2, showing the spout in retracted condition;

FIG. 4 is a perspective view showing the container partially folded into collapsed condition after manufacture, to illustrate the location of the lines of fold;

FIG. 5 is a perspective view showing the completely collapsed container;

FIG. 6 is a partially diagrammatic plan view of filling mechanism for use in a dairy or any filling location; and

FIG. 7 is a fragmentary sectional view taken approximately on the line 7—7 of FIG. 6 to show the method of suspension during filling.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring more particularly to FIGS. 1–5, inclusive, the container is formed of moldable plastic material having flexibility and strength but being relatively nonstretchable, preferably high- or low-density polyethylene or polypropylene. Other similar materials having suitable properties may be employed, such as any other plastic materials having similar properties and which are approved by the Food and Drug Association for liquids.

The container, when filled, includes sidewalls **10**, **11**, **12**, and **13**, a bottom wall **14**, and a top wall **15**. It is preferred to employ an average wall thickness in the neighborhood of 0.030 of an inch. The corner edges of the containers would be made thinner, it being preferred to have the corner edge thickness approximately 0.010 of an inch. The thinness of the material at the corners would facilitate flexing during folding for collapse. In addition, the material along the diagonal fold lines **29**, **31** and **16** would be made thinner so that the container would readily adapt itself to the folded condition of FIG. 4. Also, it is preferred to have the marginal material adjacent the edges of the spout base panel **20**, which material extends horizontally above and below the spout as at **17**, and on each side as at **18**, of thinner gauge so that the material can be caused to buckle inwardly, as shown at **17** and **18** in FIG. 3, when the spout is pushed to the retracted position of FIG. 3. It is to be noted that when the spout is in the extended position of FIGS. 1 and 2, the spout base is offset outwardly in the areas **17** and **18** an amount sufficient to permit the inward buckling of FIG. 3 after pressure is exerted. It is to be noted that while the base panel **20** is offset outwardly it is still within a corner edge recess **20'**.

The container is molded with an integral plastic handle **19** which is foldable from an upright position, as shown in dot and dash lines in FIG. 1, to a position in parallelism with the top of the container. The spout includes a projecting nozzle portion **21** having an external annular top rib **22** and an external annular rib **23** therebelow, there being an annular recess **24** between the two ribs. The spout may be closed by a cap **25** of any suitable type which is adapted to be snapped over the top rib **22** after the container has been filled. This may be a standard size snap cap, or it may be a nipple-type cap as illustrated in FIG. 3 capable of receiving various types of dispensing tubes. For example, the top of the nipple **26** may be punctured and a rubber tube slipped over said nipple when the container is ready for dispensing. The container may be made in various sizes, including an 11×11×20 inch size, a 9×9×15 inch size, and a 9×9×17 inch size. For restaurant use the containers will be in sizes to have a capacity of 5, 6 or 10 gallons to fit the standard dispensers. In addition there may be a home size which may be about 4×6×9 inches.

In practice, the container is molded by a molding process, and the molding machine temperature is sufficiently high to destroy all bacteria inside the container. As soon as the container is removed from the molding machine the container is collapsed by first inverting one diagonal half inside the other. To accomplish such inversion the bottom **14** is folded upwardly and inwardly on its corner edge **27** toward the wall **12**, the dotted lines in FIG. 4 indicating the new position of the bottom corner edge **28**. At the same time the upright wall **11** is being pushed inwardly into L-shape to fold on a line **29**, as shown in FIG. 4, which line is to be near and in parallelism with the corner edge **30**. Thus one portion of the wall **11** is against the wall **12** and the other portion **11'** is near and in parallelism with the top wall **15**. During such folding parts of the sidewalls **10** and **12** are doubled inwardly to triangular form on the diagonal lines **31** (see also FIG. 1). Thereafter the doubled portions of the walls **10** and **12** are folded inwardly again on the diagonal lines **16**, as shown in FIG. 4, so that the container may then be pushed down to the collapsed position of FIG. 5. Where the container is of a relatively long rectangular shape, as in FIG. 1, it is usually desirable before the final collapsing movement to the position of FIG. 5 to fold the

lower portion upwardly as at 32. Where the containers are of less height this is unnecessary.

Immediately after folding, which expels the air, the spouts are temporarily sealed as at 33 by suitable temporary sealing caps or by any other device. This then excludes the entry of bacteria during shipment to the dairy or other plant where they are to be used. During such shipping the collapsed containers of FIG. 5 may, of course, be stacked very compactly.

At the filling plant the remainder of the improved method of packaging may be carried out. In such method the dairy starts out with the collapsed sealed container having a relatively germ-free interior due to the fact that the spout was sealed by the manufacturer shortly after removal from the molding machine where the heat of molding killed all bacteria.

In the dairy or other plant the collapsed containers may be used in conjunction with novel filling and capping equipment as shown in FIGS. 6 and 7. This equipment includes a wheel 34 having peripheral spout-receiving recesses 35, with the wheel 34 traveling in counterclockwise direction. A container C, while still in collapsed or in the partially opened condition of FIG. 7, will have its spout seal 33 removed and the spout will then be moved laterally into one of the recesses 35 of the wheel, the material at the margin of the recess 35 being received beneath the annular rib 22 of the spout so that the container may be suspended by means of its spout from the wheel as shown in FIGS. 6 and 7. As the wheel rotates the containers will be presented to the delivery pipes 36 projecting from the filling manifold 37 and will be filled with liquid, such as milk in a dairy. During the filling operation the liquid automatically causes opening out of the collapsed container from the condition of FIG. 7 to the condition of FIG. 1. Due to the suspension method on the wheel 34, no undersupport is necessary for the containers. Where thin plastic bags are being filled within outer cartons it is necessary to have an undersupport for the cartons and bags and the bags must be manually inserted in the cartons. With the present invention this procedure is eliminated.

After filling, each container C is presented to a second wheel 38, whose periphery travels below and may be overlapped by a portion of the periphery of the wheel 34 for multiple transfer. The wheel 38 has peripheral recesses 39, and during travel the neck of the spout of a container which is below the annular rib 23 will enter one of the recesses 39 and the container will thus be transferred to the second wheel 38 where it is suspended from the lower annular rib 23 of the spout. Thereafter the containers pass the capping stations 40 and caps of the type shown in FIG. 3 or of any other type are attached. When the containers are removed from the wheel 38 onto the unloading ramp or conveyor 41 they are in capped and filled condition and are self-supporting. In this form they may be delivered to the user without further packaging, it being unnecessary to employ an outer carton.

While the invention is particularly suitable for use in conjunction with containers for dispensers, it is obvious that the improved containers may be made in smaller sizes for use in place of the conventional cardboard milk cartons now sold to stores and homes. Also, the invention is not limited to use with milk. There are other consumable liquids where sanitation is a factor which may be economically packaged in containers of this type.

Various changes and modifications may be made without departing from the spirit of the invention, and all of such changes are contemplated as may come within the scope of the claims.

What we claim is:

1. A substantially flat-folded collapsed rectangular prism container of one-piece flexible material having a rectangular, permanently closed top and having a first rectangular sidewall, a spout projecting from a corner edge between said top and first sidewall, said container having three other rectangular sidewalls and having a rectangular bottom, the bottom being folded into parallelism with said first sidewall on the corner edge between said bottom and said wall, the wall opposite said first-mentioned sidewall being inverted into L-shape with a part in substantial parallelism with the top of the container and with a part forming an extension of said bottom and in parallelism with said first-mentioned sidewall, the other two sidewalls being doubled inwardly to triangular form on diagonal fold lines, with said last-mentioned triangular doubled wall portions being kinked inwardly toward one another on additional diagonal fold lines bringing the top of the container into substantial parallelism with the first-mentioned sidewall to a substantially flat-folded condition.

2. A collapsed container as set forth in claim 1, in which the container is formed of strong, flexible, molded plastic material, and in which the plastic is of thinner gauge along the lines of fold.

3. A substantially flat-folded collapsed rectangular prism container of flexible material having a rectangular top, a spout projecting from a corner edge between said top and a first sidewall, the container having one diagonal half inverted inside of the other toward the corner edge which has the spout to provide oppositely disposed sidewalls which are doubled inwardly to triangular form, said walls being buckled inwardly toward one another between the top of the container and said first-mentioned sidewall with all wall portions in substantial parallelism.

4. A collapsed container as set forth in claim 3, in which the container is formed of strong, flexible, molded plastic material, and in which the plastic is of thinner gauge along the lines of fold.

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