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COLLAPSIBLE BULK FLUID CONTAINER

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This invention relates generally to packages or containers and more particularly, relates to an improved disposable and collapsible container for storage and shipment of fluids.

Heretofore, prior container structures of the general character with which the herein invention is concerned, i.e., those using flexible, collapsible bags of suitable material such as plastic, for bulk fluid storage and dispensing, have been less than satisfactory in many important respects. Such containers generally have recognized advantages which derive from the use of paperboard materials for the outer carton and some manner of liner to be associated with the flexible bag and which attempt to permit shipping and storage of the containers in a somewhat collapsed and flattened condition. However, prior structures of this type have been less economical to manufacture and use considering their disposable character and intended substitution thereof for bulk fluid metal containers, for instance, used repeatedly after cleansing thereof. One reason for this has been the rather involved and complicated nature of the structures for the containers which necessitated using more expensive and involved equipment for manufacturing same. Prior structures also have required holding the bag and adjusting the position thereof as it was being filled. This was time-consuming and expensive, thereby sacrificing some advantage derived from use of the more economical materials.

A very significant disadvantage of prior container structures of this general character has been encountered in the proper filling of the plastic bag. For instance, one use for such prior containers has been for storage and shipment of milk or a like liquid product which foams readily when agitated, such as, when being introduced into the plastic bag. As a result of such foaming of the liquid, difficulties are encountered in obtaining a proper measured quantity in the bag, in closing the outer carton in which the filled bag is placed, etc. A principal reason for such foaming is believed to be the presence of sufficient quantities of air in the bag prior to filling thereof with liquid. The air entrapped in the bag may be in relatively small amounts, but sufficient to cause the undesirable foaming of the liquid. Another disadvantage has been the inability to obtain a very flat bag in the collapsed condition thereof or prior to filling of the bag. Also, prior structures did not make attempt to assure unfolding and opening of the bag in the same manner during filling thereof so that it can be made to conform to the interior shape of the carton.

Accordingly, a major object of the invention is to provide a container of the character described for storage and dispensing of fluid materials which is characterized by a construction that substantially eliminates the foregoing disadvantages, as well as others.

Another object of the invention is to provide a container structure of the character described which includes a liner having the flexible bag supported thereon so that the bag may be filled with fluid while the liner is arranged on the interior of the exterior carton without requiring the bag to be held and adjusted in position during filling thereof by the operator.

Another object of the invention is to provide a container structure of the character described in which the flexible

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bag is secured on the liner in a predetermined folded condition so that during filling of the bag in an outer carton, like bags will unfold in substantially the identical manner to conform to the shape of the outer carton.

Another object of the invention is to provide a container of the character described which includes a three-sided corrugated liner of integral construction having a flexible, plastic bag adhesively secured to said sides, in folded, flat condition, said liner adapted to be shipped and stored in flat condition and adapted to be folded into a U-shaped configuration for insertion into an outer carton for filling the bag without interfering with the flattened condition of the bag.

Another object of the invention is to provide a container structure of the character described in which said bag may be formed as a simple tubular member or sleeve having conjoined edges and a spout for filling the bag, said bag and liner cooperating to permit the bag to be collapsed and folded completely flat with the liner so that upon liquid-filling the bag through said spout, foaming of the liquid is avoided substantially entirely.

Another object of the invention is to provide a container structure of the character described in which the outer carton has novel means permitting access to a spout on the flexible bag for dispensing the fluid contents thereof without opening the outer carton.

Other objects of the invention are to provide a bulk fluid container of the character described which is very economical to manufacture, storage and ship; in which the flexible bag has novel flap formations formed during filling thereof adapted to be folded flat upon the upper end of the bag; and which remains strong and rigid from the time the bag is filled.

The foregoing and other objects of the invention will become apparent from the ensuing disclosure in which a preferred embodiment has been described in detail in the specification and illustrated in the accompanying drawing. It is contemplated that minor variations in the structural features thereof may occur to the skilled artisan without departing from the scope or sacrificing any of the advantages of the invention.

In the drawing:

FIG. 1 is a perspective view of the container embodying the invention showing the liner and bag secured thereto, the bag being in folded condition and the liner expanded to show details thereof.

FIG. 2 is a sectional view taken through said container along the line 2-2 of FIG. 1 and in the general direction indicated.

FIG. 3 is a top perspective view showing the liner and bag attached thereto being inserted into an outer carton prior to filling of the bag.

FIG. 4 is a top perspective view showing the liner and bag inserted into the outer carton of FIG. 3 and the bag expanded after filling thereof with a liquid.

Referring now to the drawing, in FIG. 1, the reference character 20 designates generally the container or package embodying the invention. Said container 20 is comprised of a liner or support structure 22 for the plastic bag 24.

Liner 22 is formed of three sides or panels 26, 28 and 30 of a suitable paper stock such as corrugated paperboard. The panels are rectangular in configuration and preferably, are formed from a single rectangular sheet of corrugated paperboard with panels 26 and 30 arranged on opposite sides of the center panel 28. Each of the panels 26 and 30 is hingedly connected to a side edge 32 of panel 28 along a familiar fold line such that sides 26 and 30 comprise flaps on opposite sides of the center panel 28. As illustrated, panels 26 and 30 are substantially identical in size and slightly shorter in length than the center panel 28; however, dimensions of the liner panels may vary in

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accordance with requirements of the outer carton in which the liner and bag are to be installed.

The bag 24 preferably comprises a simple polyethylene tube, although other flexible, plastic sheet material may be used for making the same. The bag 24 may be cut to size from a continuous length of tubular stock wound flat on a reel, for instance, and heat-sealed along adjacent free edges thereof as indicated at 33 to form the closed bag. The bag 24 also may be formed as a double-ply structure or in other ways.

As seen in FIG. 2, the flattened bag 24 has a pair of identical sides 34 and 34' juxtaposed one the other so that the body of the bag is substantially flattened in collapsed condition thereof. Little, if any air is entrapped in the bag in the collapsed condition thereof. It will be appreciated that forming the bag 24 as a simple tubular structure enables the bag to be flattened out completely merely by juxtaposition of sides 34 and 34' as shown. Thus, all air is expelled from the bag and the bag remains so evacuated at all times prior to filling thereof, thereby substantially eliminating foaming of the liquid when the bag is filled.

The plastic bag 24 is secured to one surface 35 of the liner 22 by suitable adhesive 36 shown in FIG. 2. As seen in this FIGURE, a rear wall 34 of the bag is secured by adhesive 36 to the center panel 28 and adjacent portions of the side panels 26 and 30, the adhesive being applied adjacent the top edge 40 and bottom edge 42 of the panels, and extending the entire length of the bag. The adhesive may be spotted intermittently or applied across only a portion of the entire width or horizontal dimension of the bag. The horizontal dimension of the bag is substantially less than the combined length of the hingedly connected panels 26, 28 and 30, albeit longer than panel 28. The length or vertical dimension of the bag in collapsed condition is greater than the width of the liner so that the longitudinally extending portions 44 (seen in FIG. 1) can be folded over at 45 adjacent the top and bottom edges respectively of the liner and away from the surface 35, as seen in FIG. 2. The fold lines 45 are inwardly spaced from the heat-sealed edges 33 of the flat bag 24. The bag has portions 46 which extend partially across the panels 26 and 30 respectively.

Folded portion 44 adjacent the upper edge 40 of panel 28 has a spout 48 secured thereon which may comprise a nipple of suitable plastic material having an annular flange 50 at one end thereof which is adhesively secured or heat-sealed to the bag with the nipple in communication with the interior of the bag through a suitable opening in said portion 44. The spout 48 serves for filling the bag and dispensing fluid therefrom.

For purposes of shipment and storage of the container 20, the bag 24 is folded completely flat along the lines 45 and edges 33. Preferably, the liner and attached bag are to be shipped in a flat, spread condition with portions 44 of the bag folded as shown in FIG. 1. Panels 26 and 30 are folded to the U-shaped formation of FIG. 2 immediately prior to being inserted in the outer carton. For shipment and storage, the panels 26 and 30 also can be pivoted inwardly to overlie the panel 28. Depending upon the size of panels 26 and 30, one of said side panels 26 and 30 may also overlie the other in said folded condition of the liner with the bag therebetween. The portions 46 of the bag will overlie the medial body portion of flattened bag 24 secured to the panel 28 and subtend the end panels 26 and 30 respectively of the liner 22. The liner 22 with bag 24 attached thereto will be substantially flat when thus folded. After the bag 24 is attached to liner 22, it remains flat at all times prior to filling of the same.

Referring to FIG. 3, the container 20 is illustrated in opened condition, but prior to filling of the bag 28. The liner 22 has been opened by pivoting the end panels 26 and 30 one relative to the other to form the liner into a substantially U-shaped formation in which the end panels 26 and 30 are at right angles to the center panel 28. The

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U-shaped liner 22 is shown being inserted, bottom edge 42 first, into an outer carton 52 of rectangular cross-sectional dimension corresponding to cross-sectional dimension of the U-shaped liner 22. Each of panels 26, 28 and 30 are frictionally engaged with a side wall 54 of the carton. The side wall 56 of the carton is engaged by the end edges 58 of panels 26 and 30. It may be noted that the bag 24 remains completely flat during installation of the liner 22 in the carton 52. Carton 52 preferably is a familiar corrugated or cardboard structure.

Referring to FIG. 4, the liner and bag attached thereto have been inserted completely in the carton 52 and the bag filled with fluid. The filling operation is accomplished by connecting the discharge nozzle of a suitable fluid dispensing machine (not shown) to the spout 48. The bag 24 remains flat at this time supported on the liner. As fluid is introduced into the bag, the bag 24 commences to expand at its lower end and occupies the space defined by panels 26, 28 and 30 of the liner and wall 56 of the carton. When the desired quantity of fluid has been introduced to fill the bag, the tubular bag will assume a rectangular cross-sectional configuration corresponding to the cross-sectional configuration of liner 22 and wall 56 so that the flap formations 60 can be formed at the upper end 59 of the bag. Notably, the operator does not have to hold the bag or adjust the position thereof during the filling process because the bag is supported on the liner.

The flaps 60 are triangular in configuration and flat, and result from the material of the bag 24 at upper end 59 thereof after the bag is filled. The triangular flaps 60 can then be folded flat upon upper end 59 of the bag to the position shown in broken outline at 62. This permits the closure flaps 64 of the carton also to be moved to overlie said end 59 for closing the carton.

The completely flattened condition of the upper end 59 of the bag illustrates the absence of foam in the bag when the bag is filled. Any slight amount of foam might well be entrapped on the interior of flaps 60 without detrimental effect.

For transporting the container 20 in filled condition, a suitable plug or closure for spout 48 is readily provided. The very economical structure of the liner 22 and bag 24 encourages the use of the container in connection with many fluid products heretofore shipped and stored in metal containers, for instance, which are not disposable. High speed production techniques can be used to make the container 20 especially since the manner of attaching the bag 24 to the liner 22 is so simple. In practical embodiments, the container 20 was found to be very sturdy and durable and absolutely leak-proof.

Referring to FIG. 4, one of the flaps 64 has been illustrated as provided with a knock-out flap shown at 66 preferably die-cut thereinto. In the normal carton 52, these closure flaps will be made sufficiently narrow so that upon closing the carton, the flap 66 will overlie the spout 48. The flap 66 is connected to the flap 64 along the score or perforated lines 68 which will permit the flap 66 to be torn free and spout 48 withdrawn through the resulting opening. The disc 50 is larger in diameter than the resulting opening. Thus, the carton can be inverted to dispense the fluid contents of bag 24 without opening flaps 64.

It is believed that the invention has been described in sufficient detail to enable the skilled artisan to understand and practice the same. The invention has been pointed out in the claims hereto appended in language intended to be liberally construed commensurate with the scope of the invention.

What it is desired to be secured by Letters Patent of the United States is:

1. A package for storing and dispensing fluid and the like comprising, a flexible, plastic bag of tubular formation having a filling and dispensing spout at one end thereof, a liner comprised of three panels arranged end to end, said bag being adhesively secured to a portion of each of said panels, said bag being collapsed to a flattened con-

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dition and having a pair of elongated folded portions extending along the upper and lower longitudinal edges of the liner and overlying at least a portion of all of the panels, said spout being on the upper folded portion and having its axis transverse thereto, a pair of said panels being movable to a position transverse to the remaining panel, said liner and bag attached thereto being arranged to be inserted into an outer carton with the bag remaining in flattened condition whereby fluid can be introduced through said spout to expand the bag and fill the same for the storage and later dispensing of said fluid through said spout.

2. A package for fluid and the like comprising, a flexible, tubular plastic bag having a filling and dispensing spout at one end thereof, a paperboard liner having a rectangular center panel and a pair of rectangular side panels hingedly connected along a pair of opposite side edges of said center panel, said bag being adhesively secured to a portion of each of said panels in flattened condition, said flattened bag being longer than the width of the panels and having elongated folded portions adjacent the upper and lower edges of said center panel and overlying said side panels, said spout being on the upper folded portion and having its axis transverse thereto, said side panels being foldable to a position transverse to said center panel for insertion into an outer carton with said bag remaining flattened until fluid is inserted through said spout whereby the bag will be expanded.

3. A package for fluid and the like comprising, a flexible, tubular plastic bag having a filling and dispensing spout at one end thereof, a paperboard liner having a rectangular center panel and a pair of rectangular side panels hingedly connected along a pair of opposite side edges of said center panel, said bag being adhesively secured to a portion of each of said panels in flattened condition, said flattened bag being longer than the width of the panels and having elongated folded portions adjacent the upper and lower edges of said center panel and overlying a portion of said side panels, said spout being on the upper folded portion and having its axis transverse thereto, said side panels being foldable to a position transverse to said center panel for insertion into an outer carton with said bag remaining flattened until fluid is inserted through said spout whereby the bag will be expanded, said bag having substantially triangular hollow flap formations at said end thereof when the bag is filled.

4. A package for fluid or the like comprising, a tubular, flexible plastic bag having a filling and dispensing spout at the upper end thereof, a rectangular liner for

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supporting the bag both in filled and empty condition thereof, said liner comprising, a three-sided paperboard member having a center panel and a pair of side panels hingedly connected along opposite side edges of said center panel, said bag having a wall thereof adhesively secured to a portion of said panels and collapsed and having a pair of elongated folded portions adjacent the upper and lower edges of the center panel and overlying at least a portion of all of the panels whereby the bag is completely flattened on the liner, said spout being on the upper folded portion and having its axis transverse thereto, said side panels being movable to a position forming the liner into a substantially U-shaped formation for insertion into an outer carton with the bag remaining flattened until fluid is inserted through said spout whereby said bag will expand.

5. A package as described in claim 4 in which said bag has a pair of hollow, triangular flaps adapted to be folded flat upon the upper end of the bag when filled, said flaps arranged facing one the other and spaced apart upon said upper end.

6. A disposable bulk fluid container comprising, an outer carton of rectangular cross-section, a liner member having a center panel and a pair of side panels hingedly connected along opposite side edges of the center panel, said liner member being substantially U-shaped in configuration, a flexible tubular plastic bag, portions of said bag being adhesively secured in flattened condition to each of said panels, said bag thereby taking on the configuration of said liner, said bag having upper and lower folded portions overlying at least a portion of all of the panels, a filling and pouring spout secured to the upper of said folded portions with the axis of the spout perpendicular thereto, said liner being within said carton with said panels engaging against three sides of the carton, said folded portions providing a pair of triangular hollow flap formations at the upper end of the bag when said bag is filled through said spout, said flaps being foldable upon the upper end of the bag in a flat condition and said carton having closure means at the upper end thereof for closing the carton upon said flattened flap formations.

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