

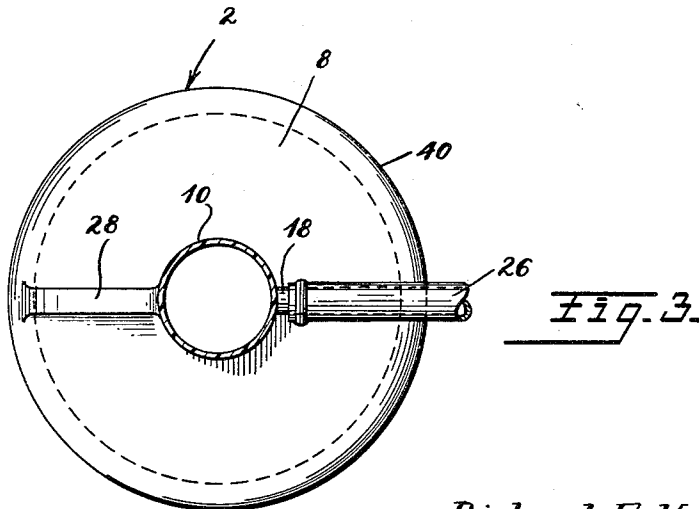
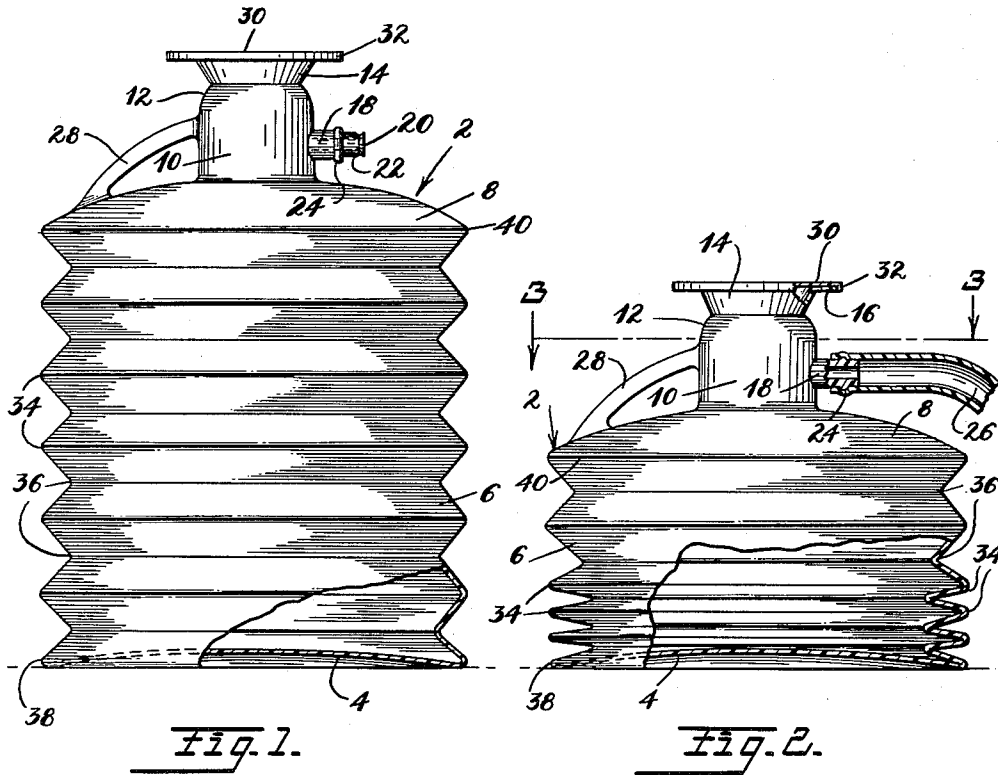
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PUMP BOTTLE

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## PUMP BOTTLE

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This invention relates to a combined storage container and dispenser for liquids and more specifically to a collapsible, plastic pump bottle.

It is an object of the present invention to provide a flexible, collapsible, liquid container adapted to discharge liquid from the side of the neck portion thereof and in a horizontal direction when the container is collapsed in a vertical direction.

Another object of the invention is to provide a lightweight, flexible, synthetic plastic container which may be filled and closed, while suspended by the upper neck portion and the outturned flange thereof, in a continuous, high-speed filling and closing machine.

Another object is to provide a molded, collapsible, plastic container which is economical to manufacture and which may be filled and closed as it is received from a plastic molding machine.

Another object is to provide a plastic container which may be handled and transported in a collapsed form, thereby reducing the space required and the cost of handling.

Another object is to provide a pump bottle of flexible, resilient, plastic material with collapsible side walls which are sufficiently resilient to be normally maintained expanded.

Another object is to provide a collapsible container with an integral, laterally extending, discharge nozzle extending outwardly from the side of the neck of the container.

Another object is to provide a closed discharge nozzle molded integrally with the neck of a bottle and extending laterally outwardly therefrom with an indicator line on which to cut off and remove the end cap of the discharge nozzle when it is desired to open the discharge nozzle to dispense the contents of the bottle.

Another object is to provide a strong, one-piece, resilient, plastic, liquid storage container and dispenser, having the entire side wall thereof collapsible and with a bottom wall which will not sag or extend below the lowermost extremity of the side wall.

These and other objects and advantages of the invention will become more apparent from the following specifications and claims when taken in conjunction with the drawings, in which

FIG. 1 is a side elevational view, partially broken away, showing the plastic bottle of the present invention in the expanded position filled with liquid and in a sealed condition;

FIG. 2 is a side elevational view, partially broken away, showing the plastic bottle partially collapsed with the closure cap at the outer end of the discharge nozzle removed and with a dispensing tube attached to the discharge nozzle; and

FIG. 3 is a view of the bottle taken on line 3-3 of FIG. 2.

In order to illustrate a preferred embodiment of the present invention, the combined liquid storage container and dispenser is shown to be in the form of a round bottle 2, formed entirely of resilient plastic material, such as polyethylene. The bottle includes a downwardly concave bottom wall 4, a collapsible bellows-type side wall 6, and the top wall 8, arched upwardly from the upper edge of the side wall 6. A cylindrical neck portion 10 extends upwardly from the center of the top wall 8 and is formed adjacent the upper end thereof with an inwardly and upwardly converging portion 12. An upper neck portion 14 ex-

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tends upwardly and outwardly from the converging portion 12 and terminates in a flat flange 16, which extends radially outwardly from the upper end of the upper neck portion 14.

A horizontal discharge nozzle 18 extends laterally outwardly from the neck portion 10 in spaced relation to the top wall 8 and the converging portion 12. The outer end of the discharge nozzle 18 is sealed closed by a cap 20 molded integrally with the discharge nozzle. In order to provide for accurately severing the cap 20 from the discharge nozzle when it is desired to dispense liquid from the bottle 2, an indicator line or notch 22 extending around the periphery of the discharge nozzle between the cap 20 and the tip of the discharge nozzle is provided. A bead 24 may be formed on the outer surface of the discharge nozzle 18 near the outer end thereof for frictionally retaining a discharge tubing 26 thereon. While the discharge nozzle 18 has been illustrated as being short and terminating over the top wall 8, it is also contemplated to provide an elongated discharge nozzle which would terminate outwardly beyond the outer extremity of the top wall 8.

The bottle is provided with a handle 28 with one end of the handle being molded to the top wall 8 adjacent the outer edge thereof and with the other end of the handle being molded to the neck portion 10 on the opposite side thereof from the discharge nozzle 18. The handle 28 is preferably solid and semi-rigid although, if desired, a passage may be provided in the handle 18 connecting the interior of the neck portion 10 with the interior of the bottle 2 through the top wall 8.

The bottle may be closed after being filled with a liquid by heat-sealing a disk closure 30 to the upper surface of the flange 16. The outer edge 32 of the disk closure 30 may be bent downwardly to confine the periphery of the flange 16.

As shown, the entire side wall 6 of the plastic bottle 2 is formed of circumferentially extending bellows which include ridges 34 and grooves 36. The lowermost portion of the side wall 6 terminates at the ridge 38 and the bottom wall 4 extends inwardly and upwardly from the ridge 38. The upper most extremity of the side wall 6 terminates at the ridge 40 and the top wall 8 is arched upwardly therefrom. By forming the entire side wall 6 of bellows in this manner, the top wall 8 may be moved into the closest proximity to the bottom wall 4 when pressure is applied to the upper end of the bottle to fully collapse the bellows forming the side wall of the bottle.

As the bottom wall 4 of the bottle is convex and is arched toward the upper end of the container, the lower portion of the container is strengthened and the bottom wall 4 is prevented from sagging and protruding below the lowermost extremity of the side wall 6 while the bottle is being filled with a liquid and when a filled bottle is being carried by the handle 28. The bottom wall 4 is arched upwardly from the periphery thereof and from the lowermost ridge 38. It will thus be seen that the bottle will contact a flat surface upon which it is placed at the juncture only of the bottom wall 4 and the lowermost ridge 38.

While the body of the bottle 2 is illustrated as being of generally cylindrical configuration, it may be formed of oval, square, or any other suitable configuration.

The plastic bottle 2 is preferably formed in one operation by blow molding the bottle with the bellows in the expanded position, as shown in FIG. 1. The side wall 6 of the bottle is formed of sufficient thickness so that the inherent resiliency of the plastic material will normally maintain the bottle with the bellows expanded to the configuration in which they were molded. The bottle of the present invention may be produced rapidly and economically and as these bottles are received from the blow molding machine, they are clean, sterile and ready to be filled

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with any type of liquid without further machining or other operations being performed thereon. The bottles may be filled immediately or they may be transported to another location and stored until needed. The bottles may be completely collapsed for handling and shipping, thus reducing the space required and the expense in handling. The bottle 2 is adapted to be filled with a liquid and the closure 30 heat-sealed thereon in a continuous bottle filling and closing machine while being suspended by the upper neck portion 14 and the flat flange 16.

When it is desired to dispense the liquid contained in a sealed bottle, the cap 20 of the discharge nozzle 18, is severed along the indicator line 22 and the discharge tubing 26 may be attached to the discharge nozzle. By pressing downwardly on the disk closure 30 or on the upper wall 8 of the bottle or on both, the side walls thereof will be collapsed in accordion fashion, as illustrated in FIG. 2, to cause the liquid in the receptacle to flow outwardly through the discharge nozzle 18. Upon release of the pressure on the bottle, the inherent resiliency of the material in the side wall will expand the bellows to the position shown in FIG. 1. When all of the liquid has been dispensed from the bottle 2, the discharge tubing 26 may be removed and the bottle may be discarded. In order to conserve space, the empty bottle may be collapsed for disposal.

Such modifications, alterations and changes in the described invention as may occur to those skilled in the art are to be considered within the spirit of this invention as fall within the broad scope of the appended claims.

I claim:

1. An integral liquid container formed of resiliently flexible plastic material, comprising: side, bottom and top walls; a neck portion extending upwardly from said top wall and terminating in an opening for filling said container; and a dispensing nozzle extending laterally outwardly from and integral with said neck portion, said side wall being formed entirely of circumferentially extending, normally expanded, substantially collapsible bellows having ridges and valleys, said top wall extending inwardly from the uppermost of said ridges, and said bottom wall extending inwardly from the lowermost of said ridges whereby said side wall will be substantially entirely collapsed by pressure applied to said top wall.

2. A container as defined in claim 1 in which said bottom wall has a concave lower surface and is arched toward the upper end of said container from the periphery of said bottom wall and from said lowermost ridge.

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3. A container as defined in claim 1 in which the outer end of said nozzle is initially sealed closed by a cap of plastic material integral with said nozzle, said cap being severable from said nozzle for opening said outer end of said nozzle.

4. A container as defined in claim 3 in which an indicator notch is formed on said discharge nozzle adjacent the outer end thereof extending circumferentially therearound indicating a severance line for severing said cap from said nozzle.

5. A pump bottle formed of resilient plastic material for storing and dispensing liquids, comprising: side, bottom and top walls; a neck portion extending upwardly from said top wall and terminating in an opening for filling said container; closure means for sealing said filling opening; and a dispensing nozzle extending laterally outwardly from and integral with said neck portion, said entire side wall consisting of collapsible and expandable bellows normally maintained in expanded condition by the resiliency of said plastic material forming said bellows whereby the side wall of the bottle may be substantially entirely collapsed by pressure applied to said top wall.

6. A pump bottle as defined in claim 5 in which the outer end of said nozzle is initially sealed closed by a cap of plastic material integral with said nozzle, said cap being severable from said nozzle for opening said outer end of said nozzle subsequent to the filling of said bottle through the upper end of said neck and the sealing of said upper, outer end and prior to collapsing said bellows for dispensing said liquid from said bottle through said nozzle.

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