Oct. 8, 1963 B. H. LOCKE 3,106,328

LIQUID CONTAINERS

Filed Dec. 7, 1960

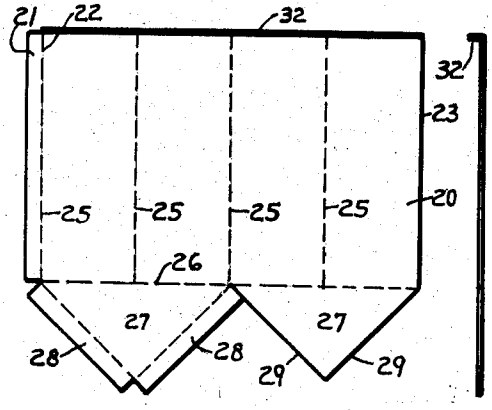


Fig. 1.

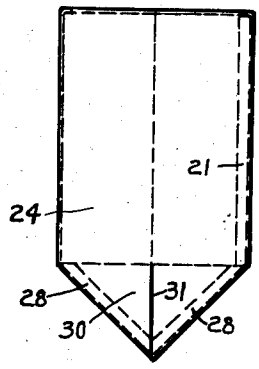


Fig. 2.

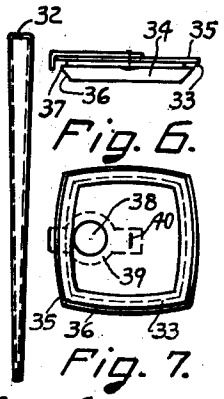


Fig. 6.

Fig. 7.

Fig. 4.

Fig. 3.

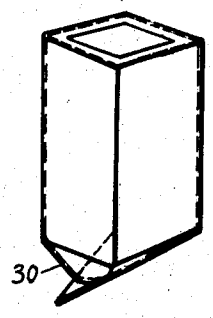


Fig. 5.

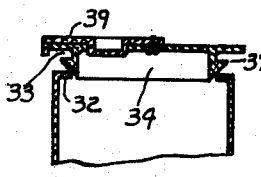


Fig. 8.

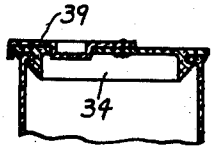


Fig. 9.

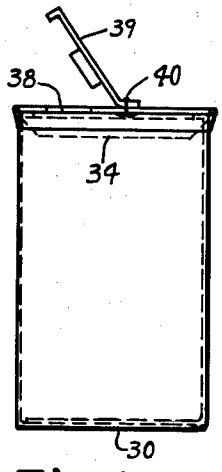


Fig. 11.

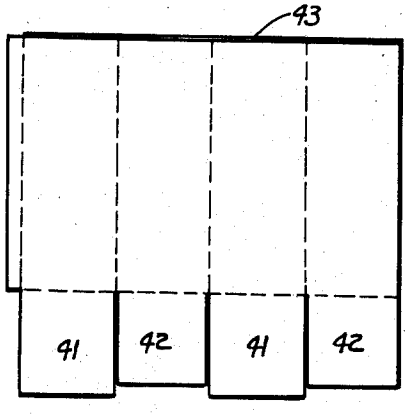


Fig. 12.



Fig. 13.

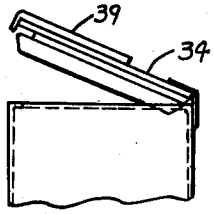


Fig. 10.

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LIQUID CONTAINERS

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2 Claims. (Cl. 229—7)

This invention relates to improvements in rectangular-shaped liquid-tight containers made of fibre material and employed to vend milk, juices, and the like, and the main object of the invention is to provide a structure that can be formed from a simple flat blank of material, to facilitate handling, that can be readily opened and formed into a rectangular container having a flat top, to facilitate stacking, the bottom and top closures being readily applied and sealed by simple operations by the liquid vendor prior to filling the container.

Heretofore, whereas containers of this type have a flat bottom, the top is of a foldable gable-shaped structure which voids stacking the containers conveniently and such containers are of a greater over-all height relative to flat top containers of like capacity and thus require greater space for packaging, transporting and storing in refrigerators, etc., where space is of an essence. A reason containers have been constructed with a foldable gable top is the difficulty involved in applying and sealing a flat top closure. For example, whereas bottom foldable flaps can be pressed together for sealing for reason that the blank is uncoated and can be placed on a mandrel to back up the parts, an internal mandrel cannot be employed in the sealing of the top closure for reason the mandrel could not be removed thereafter. Furthermore, it is essential to coat the container before the top is closed for convenience of coating and thereafter it is difficult to adhere a closure to the coated surface.

I conceive a flat top closure that can be applied and sealed in place after the blank is opened; the bottom closure sealed and the container coated with wax, plastic, or the like, to render it impervious to the liquid to be stored therein. By employing such a construction I accomplish the main object of the invention which is to afford a construction whereby a rectangular container having a flat top can be readily constructed from a flat blank with a minimum of effort.

Another feature of the invention is to afford a bottom closure that folds in position for sealing in the process of opening the flat blank to rectangular container form thereby eliminating the necessity of folding and sealing a plurality of flaps which is common practice in containers now on the market.

In the accompanying drawing:

FIGURE 1 is a plan of the blanked sheet.

FIGURE 2 is a side view of the same.

FIGURE 3 is a plan of the sheet when folded and sealed into the form of a flat blank.

FIGURE 4 is a side view of the same.

FIGURE 5 is an isometric view of the blank partially opened to container form.

FIGURE 6 is a side view of the top closure.

FIGURE 7 is a bottom view of the same.

FIGURE 8 is a fragmental sectional view showing the top closure partially inserted into the container.

FIGURE 9 is a fragmental sectional view showing the top closure sealed in place in the container.

FIGURE 10 is a fragmental elevation showing how the top closure could be hinged to one side of the container.

FIGURE 11 is an elevation of the completed container with the dispensing cover lifted.

FIGURE 12 is a plan view of a blanked sheet having conventional bottom closure flaps.

FIGURE 13 is a side view of the same.

This invention comprises a rectangular-shaped liquid container having a flat top and bottom, as shown in FIGURE 11, which is constructed of fibre material and is wax or plastic coated, or the like, to render it impervious to the liquid to be stored therein.

The sides and bottom of the container can be formed from a blanked sheet of material **20**, as shown in FIGURE 1, and the sheet can be folded on itself, as shown in FIGURE 3, and can be attached by a foldable tab **21** integral with one edge **22** and folded in under and adhered to the other edge **23** to form a flattened blank **24** to facilitate handling and then opened to the form of a rectangular sleeve to serve as the body of the container.

Sheet **20** has vertical score lines **25** defining the side corners and a lateral score line **26** defining the bottom corners of the container. The sheet **20** is in the form of 2 equal triangles **27** below the score line **26** and two foldable tabs **28** are provided to attach the outer edges **29** of the triangular portion **30** effected when the sheet is folded and sealed to form the blank **24**, shown in FIGURE 3.

The triangular portion **30** is cut at its center as shown by full line **31** and when the blank **24** is opened to rectangular form one half of the portion **30** folds in under the other half and effects a flat bottom for the container as shown in FIGURE 11. FIGURE 5 shows the blank partially opened and how the half triangular portions swing in juxtaposed relationship as the blank is opened and thereby form the flat bottom for the container. It will be noted that it is only necessary to seal one half of a triangular portion to the other half to form a liquid-tight bottom whereas in conventional containers of this type now on the market having individual flaps integral with each side, as shown in FIGURE 12, it is necessary to fold and seal 4 individual flaps together to form the container bottom. Therefore, the bottom structure shown in FIGURE 3, the triangular portions of which swing over each other in juxtaposed relationship as the blank is opened to rectangular form, affords a more simple sealable bottom closure than the conventional 4 foldable flap structure, shown in FIGURE 12.

The top edge of the container blank **24** is bent inwardly forming a continuous lip **32** projecting inwardly around the 4 sides of the blank for the purpose of entering a continuous groove **33** around a flat closure **34**, shown in FIGURES 6 and 7. Closure **34** has a flat rim **35** that overlaps the top edge of the container sides when the closure is assembled with the container and there is a tapered portion **36** convex in shape extending all around the closure **34** below the groove **33** for the purpose to lead the closure into proper position when applied to the container, as indicated in FIGURE 8. The top or largest portion **37** of the tapered portion **36** is of proper size to effect pressure engagement with the inside surface of the container and thereby retain pressure against the container sides in the final sealing of the top closure. The purpose of portion **36** being convex in shape between the corners thereof, as shown in FIGURE 7, is to effect tension on the top edge portion of the container sides thereby effecting tight contact of the container against the closure to insure a tight seal between the parts when dipped in a liquid coating solution as to be set forth hereinafter.

The inherent springing of sheet fibre material permits the closure to be forced into the container whereby the bent-in lip portion **32** of the container sides springs over portion **37** and into the groove **33** effecting a gripping lock therein. A dispensing and filling aperture **38** is provided in closure **34** and a liquid-tight cover **39** is provided for the same. The cover **39** is generally at-

tached to the closure 34 in some manner such as by a staple 40 and the cover is sealed tight in the aperture by means of the coating on the container being heated around the cover and aperture and allowed to solidify.

The container blank is generally opened and placed on a mandrel and the bottom flaps folded over and sealed by adhesive inacted with pressure against the mandrel. The blank is then removed from the mandrel and coated by dipping, generally in melted wax or plastic, or the like. The closure 34 is also coated by the same means. The closure is then sprung in place as set forth and the top portion of the container dipped whereby the liquid coating fills in around the lip 32 and groove 33 and is allowed to solidify thereby sealing the top closure securely in place. The cover 39 is then lifted, such as shown in FIGURE 11, and the container filled. The cover 39 is then again pressed into the aperture 38 and heat is applied thereto which partially melts the coating around the cover and the cover becomes sealed in place as the coating is allowed to solidify.

It is essential that the container have a full open end to facilitate coating inside which necessitates the top closure being applied after coating. It is obvious that ordinary adhesives will not bond parts that have been coated and the coating alone will not effect a strong bond between the parts. Therefore, I conceive the simple means set forth to interlock the top closure with the container sides to afford a strong attachment thereto and to utilize the coating to effect a liquid-tight seal therebetween.

The top closure forces the sides of the container outward affording a solid rim portion at the top, as shown in FIGURE 11, whereat the container is generally grasped in use, thereby preventing the container sides from collapsing at this point and breaking the relatively weak seal afforded by the coating.

In this instance, as well as in conventional container structure the bottom closure can be positioned and sealed by any suitable adhesive and pressure for reason the sheet is uncoated and the blank can be placed on a mandrel. Heretofore, containers of this type have a foldable gable-shaped top closure because of the difficulty of applying and sealing a flat top closure, as has been set forth.

The sheet shown in FIGURES 12 and 13 shows a blanked sheet having flaps 41 and 42 foldably attached to each side portion and in such construction the flaps are folded over and sealed in juxtaposed relationship to form the bottom closure of the container after the sheet is advanced to rectangular tube form. This is common bottom construction for various containers now on the market and could be used with the top closure structure set forth herein. In fact, FIGURE 13 shows a protruding lip portion 43 along the top edge of the sheet which would cooperate with a top closure 34 as set forth.

If desired, the top closure 34 could be integrally hinged to one of the container sides, as shown in FIGURE 10, in which case it would be only necessary to interlock

the top closure with the other 3 sides of the container to afford a liquid-tight seal and a substantial strong top rim around the container for handling.

I do not wish to be confined to the exact details as the same are susceptible of modification within the spirit of the invention.

For example, the bottom closure could also be of the same structure as the top closure, if desired, and in such case the integral foldable bottom closure flaps would be eliminated and the bottom edge of the blank would be turned inwardly the same as the top edge to receive the closure groove. Both closures could be applied and sealed with coating as set forth after the parts have been precoated. Obviously, a dispensing aperture would not be required in the bottom closure. Otherwise, the bottom closure could be the same as the top closure.

I claim:

1. An end closure on a rectangularly shaped tube type container of flexible fibre material comprising a flat outer surface portion overlaying the ends of the container sides and an inner tapered portion convex in shape intermediate the corners of the container extending inside of the container and forcing the sides of the container outwardly, a lateral groove around the tapered portion and underneath said overlaying portion receiving and becoming resiliently interlocked with a turned-in lip disposed around the inside of the container sides at the closure end thereof and a sealing agent sealing said lip in said groove, a filling and dispensing aperture in said closure and a liquid-tight cover for the same.

2. A liquid-tight container constructed of flexible fibre material comprising a rectangularly-shaped body portion with substantial flat end portions, a dispensing aperture in one of said end portions and a liquid-tight cover for the same, at least one of said end portions being a separate member having a flat outer surface portion overlaying a respective end of the container body portion and an inner tapered portion convex in shape intermediate the corners of the container extending inside of the container and forcing the sides of the container outwardly and a lateral groove around the tapered portion and underneath said overlaying portion interlocking with a a turned-in lip disposed around the inside of the container sides at the respective end thereof and sealed in position by a liquid repelling agent.

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