Dec. 23, 1941. A. E. MEADE 2,267,246

CONTAINER

Filed May 25, 1938 2 Sheets-Sheet 1

Fig. 1.

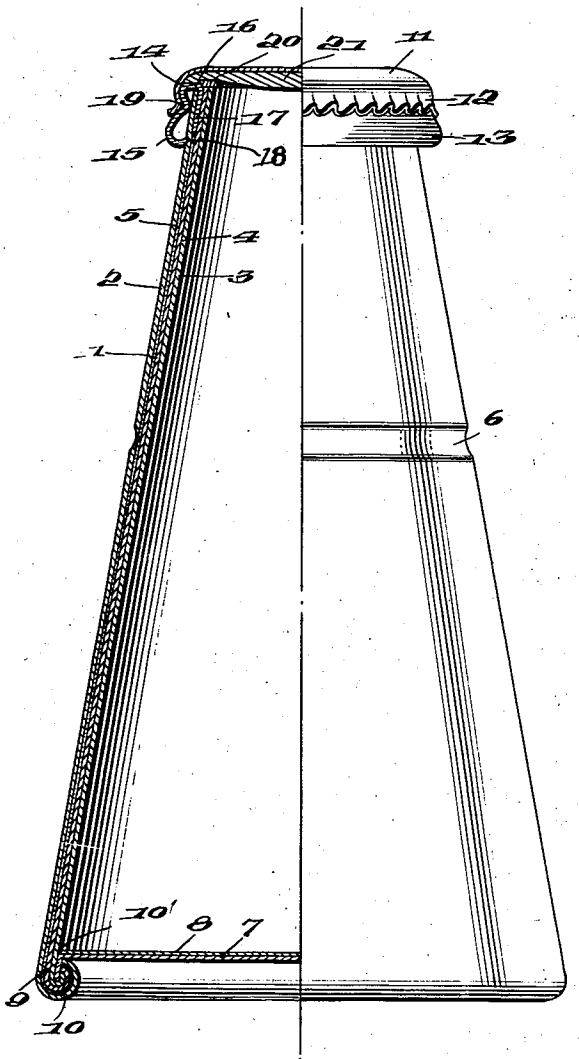

Fig. 2.

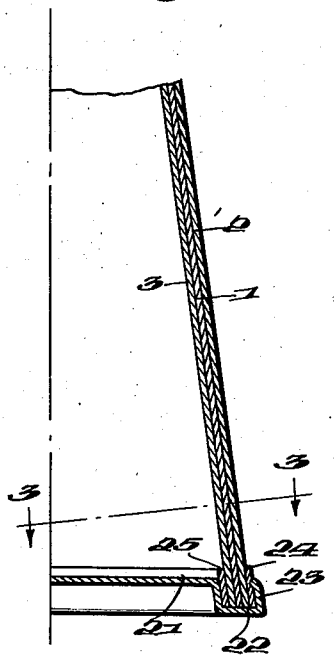

Fig. 3.

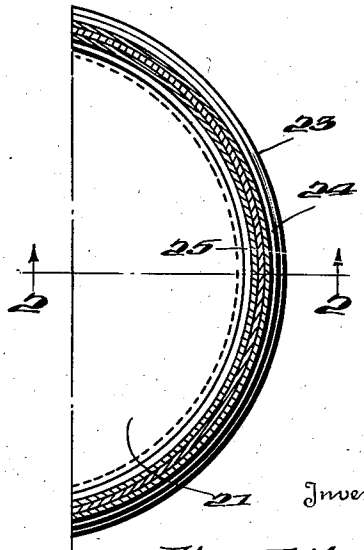

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Fig. 4.

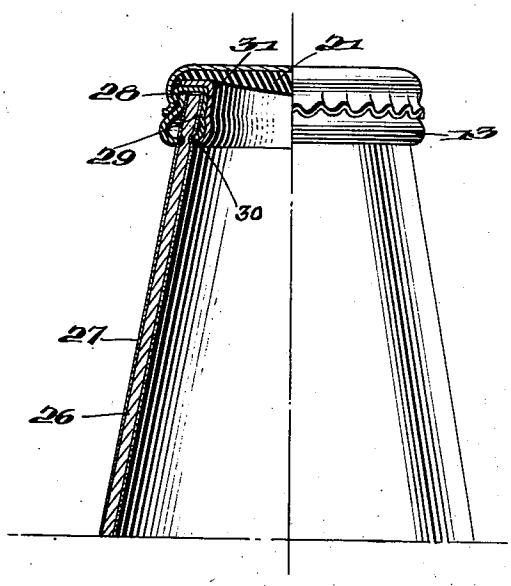


Fig. 5.

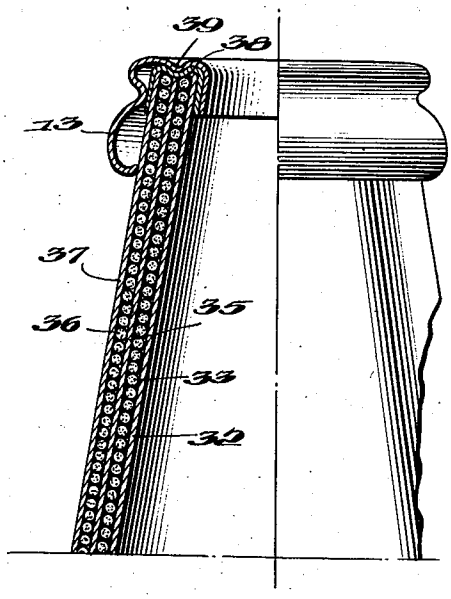


Fig. 6.

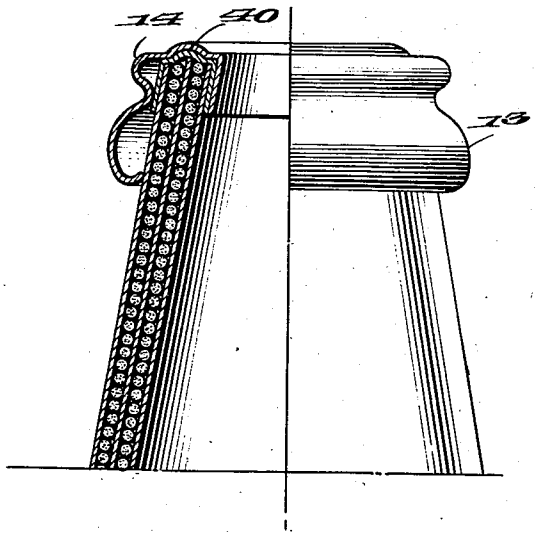
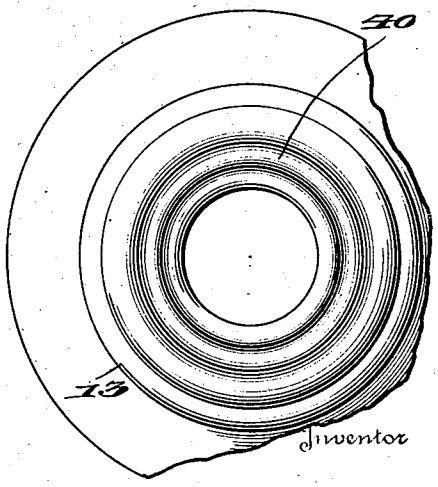


Fig. 7.



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2,267,246

CONTAINER

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Application May 25, 1938, Serial No. 210,025

5 Claims. (Cl. 229—5.7)

This invention relates to containers to be used for the packaging of liquids and is directed particularly to so-called paper containers for the handling and dispensing of materials such as oil, greases, aciduous or alkaline substances, medicines, beverages and other products. In fact, it is designed so that it may be used in connection with dry materials having absorptive properties such as salt, cereals, as well as commodities of a semi-liquid character.

In the use of such containers for handling liquid materials the walls thereof must be so treated as to prevent penetration by the contained material through the walls of the container since such a condition would render the container totally unfit for use in addition to the fact that the walls would be so weakened as to destroy the same. In addition, leaking of containers, or admission of air, or escape of gaseous matter inherent to some packaged contents thereof, such as beer, will either contaminate the package contents, cause fermentation or destroy the keeping qualities thereof. In some instances, especially where containers are shipped together in cartons, the leaking of one container may detrimentally affect the companion containers should each wall of the containers be not properly treated as described herein.

Liquid materials have heretofore been packaged largely in bottles or other glass containers and in the case of beverages such as beer, there has been a tendency lately to dispense the same in metal or like cans. In both instances, however, considerable expense is involved and the additional objection is present that provision must be made for collecting the empty containers or for storing the same until they can be disposed of.

The present invention overcomes these objections by providing a relatively inexpensive container which can be readily burned after the contents have been removed, so that the problem of disposal is eliminated.

An important object of the invention is to provide a container having separately applied closures with means for effecting a liquid-tight and air-tight seal between the closures and the container body, as well as to prevent leaking, wicking or capillary action through the ends, seams or laminations of the container, either from the inside or outside.

A further object is to provide a paper container that can be handled by conventional bottling machinery in use today and one which will withstand the forces necessary to tightly cap the container.

Other objects and advantages will be clearly apparent as the description proceeds, it being understood that changes in size, shape and details of construction may be resorted to without departing from the spirit of this invention as defined in the appended claims.

Referring now to the drawings forming part of this application,

Figure 1 is a side elevation of my invention partially in section.

Fig. 2 is a fragmentary sectional view taken on the line 2—2 of Fig. 3 and showing a modified construction.

Fig. 3 is a fragmentary sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is a fragmentary elevation showing parts in section and depicting a further modification.

Figs. 5 and 6 are views similar to Fig. 4 and disclosing additional modifications.

Fig. 7 is a fragmentary plan view of Fig. 6.

Referring to Fig. 1, the container is shown as being constructed of a laminated side wall construction embodying an intermediate wall 1, an outer lamination 2 and an inner liner 3.

The intermediate lamination 1 may be of chipboard, chestnut, manila or similar porous, absorptive, cellulosic material which is relatively inexpensive, and as illustrated, it is rolled to a conical form from a suitable blank of material with the ends overlapped and glued together, it being understood that the intermediate layer may consist of a plurality of laminations of such material to strengthen the body wall.

In order to render such material suitable for use in packaging of liquids it must be suitably treated so as to prevent the contents of the container from penetrating through to the outside of the container, and in order to accomplish this the liner 3 is provided and attached to the intermediate wall 1 by means of any suitable adhesive.

In order to prevent moisture from working into the wall 1 from the outside, and also to prevent working of liquid that might have reached the intermediate layer 1 from leaking to the outside of the container, the outer lamination 2 is provided and is treated in a suitable manner so as to render the same moisture-repellant. Both the liner 3 and the outer lamination 2 are formed from suitable blanks of paper or cellulosic material rolled to conical form and with their meeting edges overlapped and glued together as described in connection with the layer 1. In order to add strength to the wall con-

struction the seams of the three laminations are preferably staggered circumferentially about the body.

The innermost liner 3 consists preferably of pre-formed sheet-like material, although in some instances it may be sprayed with liquid-proof material to form a skin, film or membrane thereon. It may be coated paper or it may consist of other sheet-like materials such as rubber hydroxide or equivalent materials such as "Pliofilm" or "Pliolite," it being understood that any suitable material may be used so long as it renders the liner 3 liquid-proof and does not contaminate the material within the container which is in direct contact with this lining material. In some instances parchmentized paper has been found to be admirably suited for the purpose.

When the package is used in connection with beverages such as beer, the liner consists preferably of a coated paper, the coating material used being brewer's pitch modified somewhat by the use of plasticizers so that the film or coating is rendered more resilient and flexible and therefore will not crack, chip or peel from the lining material. It is understood that where the side walls of the container are of flexible material such as paper, a rigid coating material cannot be successfully used because the flexing of the wall due to pressure thereon would cause cracking and consequent leaking of the contents through the side walls of the container, and/or particles of the inner liner chipping off into the contents of the package.

The coating material such as brewer's pitch mentioned above can be applied to the inner face of the lining material in any suitable manner, although it is preferred that it be applied in plastic or liquid state and rolled into the pores of the paper. After it is hardened the inner face of the liner with the coating thereon may be sprayed with additional brewer's pitch so as to insure closing of any pin holes that may have formed in the coating. The inner liner is secured to the intermediate wall by suitable adhesive as indicated at 4 and the outer lamination is likewise adhered to the intermediate wall 1 by an adhesive indicated at 5, it being understood that the adhesives employed must be of such character as not to be affected should the contents of the container or other moisture reach them.

The outer lamination 2 is also of cellulosic material, preferably of a light color, to allow printing thereon, and the outer surface thereof is then suitably treated to render it moisture-proof, the moisture-proof coating being transparent so that the printing is visible therethrough. In this manner the layer 2 may constitute the label for the package and bear the name of the manufacturer or other indicia thereon.

In order to prevent slipping of the container in the hand the outer lamination 2 is provided with one or more circumferentially extending groove 6 pressed or otherwise formed or applied in the outer surface thereof while leaving the inner surface of the container smooth so as not to impede dispensing of the contents.

From the foregoing it will be seen that the walls of the container are all of paper or cellulosic material such as chipboard or other inexpensive paper-like material which can be readily burned after use, and that the container can be readily disposed of by burning after the contents have been removed, thereby eliminating the problem of disposition of empty containers, and that the intermediate wall is protected from moisture both from the inside and from the outside so that the intermediate wall will not weaken due to contact with moisture which would break down the fibrous structure thereof.

The conical open-ended body comprising the laminated structure as outlined above is closed at one end by means of a bottom 7 which is of cellulosic or paper material acting in the same manner as the intermediate liner 1 and is provided with a liquid-proof surface on the inner face thereof as indicated at 8, which is of the same character as the liner 3. Although an outer lamination such as 2 has not been shown such outer layer may be used if found necessary.

The bottom 7 is secured to the side walls of the container by means of a depending flange 9 about which the side wall laminations are rolled as indicated at 10, and in order to insure against leakage of the contents at the joint 10' between the bottom and side walls, the joint may be filled with suitable thermo-plastic or thermo-setting material, after which heat and pressure may be applied to the rolled end 10 to fuse the surface 8 to the liner 3, or an additional amount of the coating material may be applied at the joint.

In cases where rubber hydroxide or the like is used as the facing material for the liner and for the bottom 7 it will be appreciated that the application of pressure and heat to the rolled end 10 will cause fusion between the side and bottom walls so that in effect there is provided a sealed bag of liquid-proof material surrounded by the other laminations for the purpose of providing strength and rigidity.

The upper end of the container is closed by a crown cap of conventional type as indicated at 11 and which is provided with the usual crimped portion 12.

In order to enable containers of this type to be capped with such a cap in the conventional type of bottling machinery, it is necessary to reinforce or strengthen the open end thereof. This is accomplished in the present case by providing a reinforcing ring 13 surrounding the body of the container at said end.

The ring 13 may be of metal, or molded fiber or plastic material so shaped as to provide a closure locking ring 14 and a depending fulcrum ring 15 which will be hereinafter described.

The ring 13 is secured to the container by means of an inwardly turned flange 16 passing over the edge of the lamination 2 and terminating in a downwardly directed lip 17 which is located between the intermediate wall 1 and the outer lamination 2 and attached thereto by means of suitable adhesive.

The fulcrum ring 15 is curled at its lower end so as to bite into the outer lamination 2 as shown at 18, thereby locking the ring to the body and preventing accidental removal of the ring 13 when the cap 11 is removed.

The cap 11 is secured to the ring 13 so as to close the container by crimping the elements 12 into the grooves 19 formed in the locking ring and the bulged fulcrum ring extends below the cap so that it acts as a fulcrum when the lever type bottle openers are used to remove the cap 11. In the absence of such ring the opener would destroy or injure the fibrous wall structure.

Due to the fact that the intermediate lamination 1 is of a highly porous and absorptive character, provision must be made to prevent seepage of the liquid contents between the cap and the end

walls as well as seepage which might occur from the outside and which will work its way toward the ends of the intermediate wall 1 by capillary action. In order to accomplish this an end coating 20 is provided which extends across the raw edges of the intermediate and inner lining members as shown and is tightly engaged by the conventional cork 21 with which the cap 11 is lined when the cap has been applied and the elements 12 crimped into the groove 19.

It will thus be seen that by employing the reinforcing ring 13 provision is made for capping the container by means of conventional machinery and that the upper end of the container is reinforced against collapse or expansion due to the capping operation, it being noted that the reinforcing ring forms in effect a tubular ferrule extending circumferentially about the open end of the container, it being readily appreciated that the tubular construction materially strengthens the ring 13.

In Fig. 2 a modified construction is shown in that the bottom closure may be of metal as shown at 21 and which is suitably lined with a coating that will not contaminate the contents, such for instance as brewer's pitch.

The closure 21 is provided with a groove 22 to receive the laminated wall structure and the flange 23 is spun inwardly so as to cause the flange to bite into the container. In order to avoid injury to the side wall container I find it desirable to employ liquid-proofed dams 24 and 25, it being understood that a similar dam may be employed between the lip 18 and the outer lamination 1 in Fig. 1.

Referring now to Fig. 4, it will be seen that the construction shown therein is quite similar to the disclosure in Fig. 1 except that in this case the wall of the container consists of a single ply of material as shown at 26. This ply is suitably liquid-proofed by means of a coating such as hereinbefore described and indicated at 27, it being noted that the coating material extends over the raw edges of the ply at 28 to prevent wicking.

In this construction the reinforcing ring 13 does not extend between the intermediate lamination 1 and the outer lamination 2 as in Fig. 1, but over the end wall thereof and into the interior of the container as shown at 29, and has its lower end forced into the body of the wall 26 as at 30, although dams similar to those indicated at 24 and 25 in Fig. 2 may be used at this point. Therefore, the inner surface of the ring 13 is exposed to the contents of the container unless some provision is made to guard against such action. This difficulty is overcome by coating the ring by means of suitable material which will not contaminate the contents as indicated at 31, or by securing thereto liquid-proofed paper or the like, it being noted that the coating material completely covers the inner surface and extends over the end thereof so that it is engaged by the cork 21 and forms a tight seal therewith.

The modification shown in Fig. 5 relates to an alternative wall construction and consists of an inner liner 32 which may be of the same material as described in connection with Fig. 1. Around the liner there is wrapped a cord made of paper such as kraft, chestnut or like papers or from other cellulosic materials that are coated, saturated or impregnated so as to render the material repellant to aqueous or greasy substances. If desired the cords may be constructed of cotton, jute, hemp, which have been similarly liquid-proofed, or they may be of resinous materials or materials having glass-like properties such as spun glass, which do not require treatment to render them liquid-proof, since they are in themselves resistant to moisture and corrosion.

After the cord 33 has been wound on the liner 32 the abutting joints or seams may be filled with suitable plastic material or heat may be applied thereto to cause the coating material to fuse at its point of contact so as to close any voids or openings between the cords.

The intermediate lamination 35 is then adhered to the layer of cords and a second layer of cords 36 wound on the intermediate lamination and treated in the same manner as the first cord lamination, after which the outermost lamination 37 similar to the element 2 in Fig. 1 is applied.

The reinforcing ring 13 is then secured to the open mouth of the body, a coating of sealing material 38 having previously been applied over the edge of the body to prevent wicking, after which the ring is crimped in place. In this instance the ring 13 is provided with a groove 39 into which the cork 21 of the cap will be depressed, thereby forming an additional seal.

It will be seen from Fig. 5 that the coating 38 prevents the reinforcing ring 13 from biting into the walls of the container and thereby weakening the same at that point.

While the construction shown in Fig. 5 has been described as embodying three sheet-like laminations, it is to be understood that a wall may be built up solely of the cord laminations, in which event they are wound into tubular form with the laminations abutting, after which they may be sealed together either by the application of an adhesive between the walls, or if the cords are constructed of fusible material the application of heat and pressure will effect this result. In this construction the entire inner surface of the ring 13 is coated with material that will not contaminate the contents of the container.

The form shown in Fig. 6 is the same as that disclosed in Fig. 5 except that in place of the groove 39 a ridge 40 is provided which extends around the open mouth of the container, it being understood that when the cap is applied this ridge will bite into the cork to insure a good seal.

While the construction illustrated in Figs. 5 and 6 has been described as having been built up by wrapping the cords 33 and 36 about the laminations 32 and 35, respectively, it should be understood that the cords may be wound either convolutely or spirally on a mandrel to produce open-ended tubular shells which may be nested with the layers 32, 35 and 37 and secured thereto as heretofore described.

In all forms of the invention it will be evident that a body construction of very low cost is provided which has all of the advantages of glass or tin containers, and that by the provision of the reinforcing ring a commercially acceptable container can be manufactured and which can be closed by present day bottling equipment. Due to the relative flexibility of the side wall construction it will be obvious that breakage of the container is not likely to occur as in the case of more rigid containers such as cans, it having been found that dropping of containers made in accordance with the present invention does not result in splitting of seams as is the case of metal containers, and that the present device can be manufactured at a cost appreciably lower than glass and metal containers now on the market.

Having thus described my invention, what I

claim as new and desire to secure by Letters Patent is:

1. In a liquid-proof paper container, a body comprising a laminated side wall and an open end, means for closing said end comprising a reinforcing ring surrounding the same, said ring having an inner lip secured to the side wall, a horizontal flange overlying the end of at least one lamination and a depending outer skirt, said skirt having a circumferential groove therein to lock a crown cap on the body, and a bulged fulcrum ring below the cap, said fulcrum ring being curled inwardly to interlock with the wall construction.

2. In a liquid-proof paper container, a fibrous body having an open upper end, a continuous metal reinforcing ring encircling said open end and extending over the upper edges of the body, said ring being provided with a circumferential groove intermediate its upper and lower ends to receive a closure cap and having an outwardly bulged apron below said groove, said apron terminating in an inturned lip engaging the side wall of the body.

3. In a liquid-proof paper container, a fibrous body having an open upper end, a continuous metal reinforcing ring encircling said open end and extending over the upper edges of the body, said ring being provided with a circumferential groove intermediate its upper and lower ends to receive a closure cap and having an outwardly bulged apron below said groove, said apron terminating in an inturned lip engaging the side wall of the body, and means to prevent the contents of the container from coming into contact with said metal reinforcing ring.

4. In a liquid-proof paper container, a body comprising a laminated side wall and an open upper end, a continuous, rigid, reinforcing ring encircling said upper end and extending over the upper edges of the body, a groove on the exterior of said ring to receive a crimped cap and terminating in an outwardly bulged portion having its lower end contacting the wall of the body, said ring having a depending inner lip extending between the laminations of the body and being secured thereto, whereby the contents of the container will not contact said ring.

5. In a liquid-proof paper container, a body having an open end, a continuous rigid ring encircling the upper edges of said open end and having a flange extending over a portion of the upper edge of the body, a depending lip integral with said flange and projecting into said body intermediate the inner and outer surfaces thereof, a sealing ring supported by the upper edge of the body and forming a continuation of said flange, and a removable cap for the open end of said body, said cap having a crimped skirt and a cork seal lying within the cap, said cork engaging the flange and sealing ring whereby the contents of the container cannot contact the reinforcing ring.

ALEXIS E. MEADE.