Nov. 7, 1961 P. S. LANGEY 3,007,610

WIREBOUND CONTAINER FOR LIQUIDS

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Fig. 1B

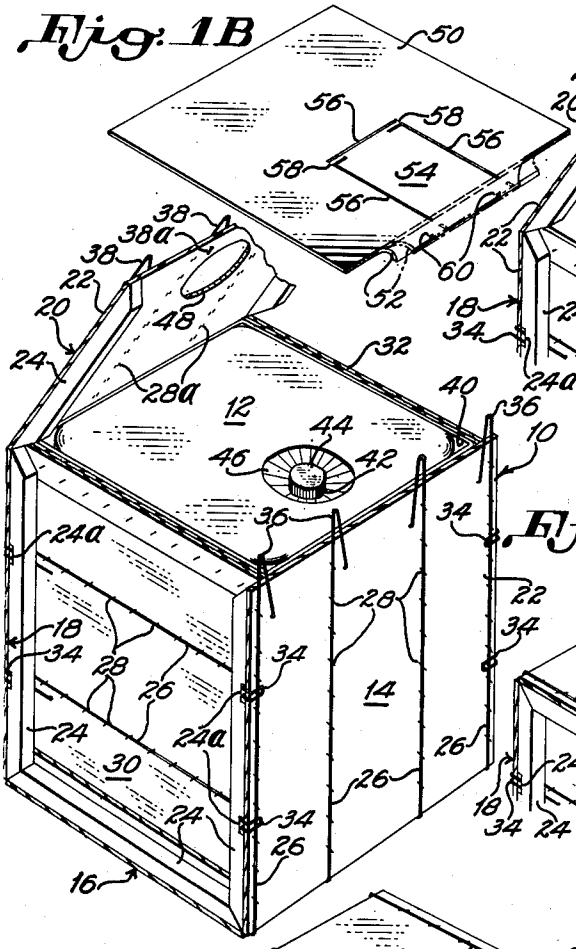


Fig. 2

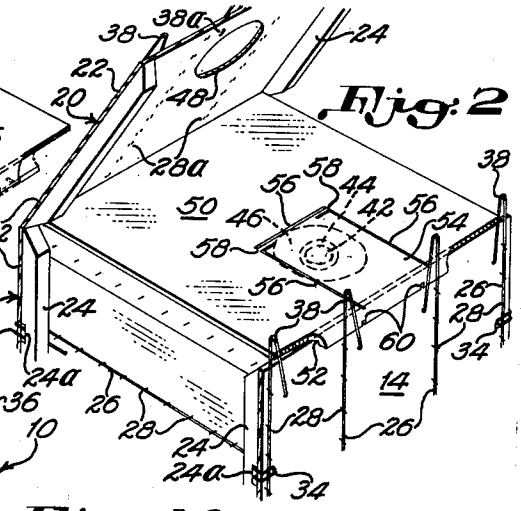


Fig. 1A

Fig. 3

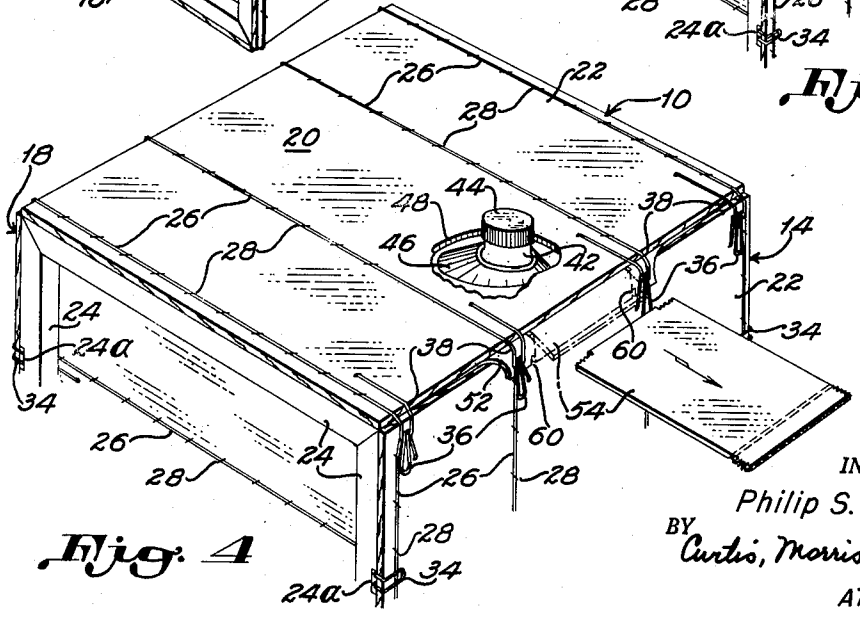


Fig. 4

INVENTOR.
Philip S. Langey
BY Curtis, Morris & Safford
ATTORNEYS.

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WIREBOUND CONTAINER FOR LIQUIDS

Philip S. Langey, Denville, N.J., assignor to Stapling Machines Co., Rockaway, N.J., a corporation of Delaware

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This invention relates to wirebound containers for the transportation and storage of liquid materials.

Heretofore, corrosive liquids such as acids, which could not be shipped in metal cans and drums have customarily been shipped in glass carboys enclosed in protective nailed wooden boxes. However, these carboys have a number of substantial disadvantages. In the first place, their initial cost is quite substantial, and in order to keep the shipping expense within reasonable limits, it is necessary for the containers to be returned and reused. Freight charges are incurred on the return shipment, and the carboys must be thoroughly cleaned, any damage to the wooden overwrap must be repaired, and any lost or damaged caps or gaskets must be replaced. Bookkeeping operations are involved in billing for containers and in giving credit for their return, and in depreciating them. Where the containers are used to carry liquids which are subject to the regulations of governmental agencies, the containers must be subjected to periodic retesting to determine whether they still meet the established standards.

The present invention provides a container for the shipping and storage of liquids the initial cost of which is so low that the container may be disposed of after a single usage, thereby eliminating all of the aforementioned problems relative to return and re-use. The container of the present invention has a tare weight which is only a minor fraction of the weight of a boxed glass carboy of the same capacity, thereby substantially reducing shipping costs. In addition, it has an approximately cubical shape and its volume only slightly exceeds that of the liquid itself. Moreover, there are no protrusions on the containers so that they can be stacked without spacers. Thus a much more efficient utilization of storage and shipping space can be obtained; over twice as much liquid can be stored in a given space as can be stored with boxed glass carboys.

Despite its light weight, the container of the present invention is actually much stronger than a boxed glass carboy of comparable capacity. For example, current regulations controlling the shipment of thirteen-gallon boxed glass carboys require that they stand a swing test equivalent to a 9.3 inch free drop, while a fifteen-gallon container made in accordance with the present invention can easily withstand a series of four-foot drops.

In general terms, the container of the present invention consists of a wirebound wooden box enclosing a flexible plastic liner which forms a liquid-tight enclosure. The plastic liner is provided with a removable closure, such as a screw cap, and the top of the outer box is provided with an opening opposite this cap. During shipping and storage, the cap is recessed beneath an interliner of cushioning sheet material such as corrugated fiberboard which closes the opening in the top of the box. Access to the cap is obtained through a perforated section of the interliner which is separated from the interliner by pulling a flap which projects from one side of this section through a slit in the closing corner of the box.

In the drawings:

FIGURE 1A is a fragmentary isometric view of an illustrative wirebound container embodying features of the present invention with the top section or lid shown in raised position, and with the top sheet of the interliner missing.

FIGURE 1B is an isometric view of the top sheet of the interliner of the container shown in FIGURE 1A.

FIGURE 2 is a fragmentary isometric view of the container shown in FIGURE 1A with the top sheet of the interliner shown in FIGURE 1B inserted into proper position in the top of the container.

FIGURE 3 is a fragmentary isometric view of the container with the top section or lid closed and secured by the loop fasteners at the closing corner of the container.

FIGURE 4 is a fragmentary isometric view of the container, at slightly enlarged scale, with the portion of the top sheet of the interliner which overlies the spout of the liner being shown pulled away to permit access to the spout through the opening in the lid.

As may be seen in FIGURE 1A, the container of the present invention generally comprises a wirebound box **10** housing a plastic bag or liner **12** which is formed of flexible but semi-rigid, impermeable plastic material which substantially conforms to the interior surface of the box **10**.

The box **10** is formed from a box blank having four box sections or sides respectively designated **14**, **16**, **18** and **20**, each of which is formed of face material **22** with reinforcing cleats **24** at the inner face thereof at each of the longitudinal edges of the box blank, and with the four box sections or sides foldably secured together by four binding wires **26** which extend the full length of the box blank and which are secured to the several sections by staples **28**. The staples **28** which straddle the two outside binding wires **26** are driven through the face material **22** and into the cleats **24** while those which straddle the two intermediate binding wires **26** are driven through the face material **22** and clinched over against its undersurface, as shown at **28***a*. The ends of each of the cleats **24** are mitered and the mitered ends of the cleats on adjacent sections or sides come into abutment with one another at the four corners of the box.

The two box ends **30** and **32** are also provided with binding wires **26** secured thereto by staples **28**, and the ends of each of these binding wires are formed into loop fasteners **34** which extend through notches **24***a* in the cleats **24** of the front and rear sections **14** and **18** of the box and are bent around the corners of the box and against its front and rear faces to secure the ends in place.

The two ends of each of the four binding wires **26** on the box blank itself are likewise formed into loop fasteners **36** and **38** which are secured by means of prongs on the ends of the wires, these prongs being driven through the face material **22** and clinched over against the undersurface thereof as shown, for example, at **38***a*.

Interposed between the box **10** and the plastic liner **12** is an interliner **40** of a cushioning material such as corrugated fiberboard which lines the box **10** throughout and serves to protect the liner **12** from abrasion or puncturing due to any roughness or protrusions at the inner surface of the box, such as the clinched staples **28***a* or the clinched prongs **38***a* of the loop fasteners.

The liner **12** is provided at its upper side near the closing corner of the box with a spout **42** which communicates with the interior of the liner and which is normally closed by a screw cap **44** which is threaded onto the end of the spout. The spout is centered in a generally conical recess **46** in the upper face of the liner **12**, the depth of the recess being equal to the overall height of the spout **42** and cap **44** so that the top of the cap does not project above the upper surface of the liner **12**.

The top section **20** of the box is provided with a circular opening **48** through the face material **22** opposite the recess **46**. However, the recess **46** and the spout **42** therein are normally covered by the top sheet **50** of the interliner **40**, which is shown separately in FIGURE 1B.

As may be seen in that figure, the sheet 50 conforms in size and shape to the inner surface of the top section 20 of the box blank, except for a narrow, projecting flap 52 at the center of one side. In the area opposite the recess 46 in the liner 12 and the opening 48 in the top section 20 of the box, adjoining the flap 52, there is a rectangular portion 54 of the sheet 50 which is outlined by perforations 56 which extend completely around the three inner sides of the portion 50 except for narrow uncut portions 58 at its two inner corners.

As shown in FIGURE 2, when the top sheet 50 of the interliner is in place in the top of the box, the flap 52 projects beyond the upper edge of the face material on the front section 14 of the box and is bent down between the outer surface of the face material and the upwardly projecting loop fasteners 36 while the rectangular portion 54 overlies the recess 46. As shown in FIGURE 3, when the top section or lid 20 of the box is bent down into closing position, the loop fasteners 36 on the front section of the box extend through the somewhat wider loop fasteners 38 on the top section 20 and are bent down around them and against the outer surface of the front section 14 to secure the box closed. The opening 48 in the top section 20 of the box is closed by the portion 54 of the upper sheet 50 (FIGURES 1B and 2) of the interliner. The box is thus ready for storage or shipment.

As shown in FIGURE 4, access to the spout 42 may be had by grasping the flap 52 and lifting it away from the outer surface of the front section 14 of the box, separating the central portion of the flap, from the two end portions, which are still held beneath the interengaged loop fasteners of the two intermediate binding wires 26. As may be seen in FIGURE 1B, the flap 52 is provided at its outer edge with notches 60 which facilitate separation of the central portion from the two end portions. After being thus lifted, flap 52 may be pulled straight outwardly, as shown by the arrow in FIGURE 4, severing the narrow portions 58 (see also FIGURE 1B) by which the portion 54 is connected to the remainder of the top sheet 50, and allowing the portion 54 to slip outwardly through the slit at the closing corner of the box, as illustrated in FIGURE 4.

This exposes the spout 42 and cap 44 through the opening 48 in the lid 20. Then the spout 42 and cap 44 may be pulled outwardly, as shown in FIGURE 4, causing the recess 46 to be inverted and forming, in effect, a funnel-shaped extension of the spout 42 so that the spout projects through the opening 48 a short distance beyond the outer surface of the lid 20, in position for pouring.

As liquid is poured from the container, the flexible liner 12 collapses under atmospheric pressure so that its capacity is reduced to conform to the volume of the remaining fluid. Thus, it is unnecessary for any air to enter the container as it is emptied, and fluid can be poured from the container without gurgling or surging. This is a substantial advantage in the handling of corrosive liquids, since it greatly reduces the possibility of spilling or splattering.

The liner 12 is formed of a suitable plastic material, such as polyethylene, and can safely be used with practically all liquid materials. The wirebound box and the liner form in conjunction a surprisingly strong though lightweight container which can withstand considerable rough handling.

It will therefore be appreciated that the aforementioned and other desirable objectives have been achieved by the present invention. However, it should be emphasized that the particular embodiment of the invention which is described herein and shown in the accompanying drawing is intended as merely illustrative of the principles of the invention rather than as restrictive of the scope thereof, which is limited only by the appended claims.

I claim:

1. A container for liquids comprising a box, a flexible liner of impermeable material within said box, said liner being substantially conformable to the interior surface of said box and forming a liquid-tight enclosure, an opening in said liner adjacent one of the corners of said box, a removable cap closing said opening, an opening in one of the faces of said box opposite the opening in said liner, and an interliner of cushioning sheet material interposed between said container and said liner on at least said one face of said box, a portion of said interliner opposite said cap being outlined substantially around three sides by perforations and having at the other side a flap projecting through a slit at said corner of said box in position to be grasped and pulled to separate said portion from said interliner along the line of said perforations and expose said cap through the opening in said box.

2. A contianer for liquids comprising a wirebound box having at least three encircling binding wires opposite ends of each of which are secured together at the closing corner of the box, a flexible liner of impermeable material within said box, said liner being substantially conformable to the interior surface of said box and forming a liquid-tight enclosure, an opening in said liner adjacent said closing corner, a removable cap closing said opening, an opening in one of the faces of said box opposite the opening in said liner, and an interliner of cushioning sheet material interposed between said container and said liner throughout substantially the entire interior surface of said box, a portion of said interliner opposite said cap being outlined by perforations substantially around three sides and having at the other side an integral flap which projects through a slit in said closing corner and is normally held down against the outer surface of the adjacent face of said box by the overlying binding wires at either side of said portion, whereby said flap may be grasped and pulled first upwardly away from said surface and then outwardly to separate said portion from said interliner and expose said cap through the opening in said box.

3. A container for liquids comprising a box, a flexible liner of impermeable material within said box, said liner being substantially conformable to the interior surface of said box and forming a liquid-tight enclosure, a recess in said liner, a tubular spout in said recess, removable means closing said spout, said spout communicating with the interior of said liner, an opening in one of the faces of said box opposite said recess and an interliner of cushioning sheet material interposed between said container and said liner on at least said one face of said box, a portion of said interliner opposite said recess being separable from the remainder of said interliner to expose said recess through said opening, said spout being normally retracted into said recess beneath said portion of said interliner, but being extensible through said opening by inversion of said recess when said portion is separated from said interliner.

4. A container for liquids comprising a wire-bound box, a flexible liner of impermeable material within said box, said liner being substantially conformable to the interior surface of said box and forming a liquid-tight enclosure, a recess in said liner adjacent the closing corner of the box, a rigid tubular spout in said recess, a cap removably closing said spout, said spout communicating with the interior of said liner, an opening in one of the faces of said box opposite said recess and an interliner of cushioning sheet material interposed between said container and said liner on at least said one face of said box, a portion of said interliner opposite said recess being outlined substantially around three sides by perforations and having at the other side an integral flap which projects through a slit in said closing corner and is normally held down against the outer surface of the adjacent side of said box by overlying binding wires at either side of said portion, whereby said flap may be grasped and pulled first upwardly away from said surface and then outwardly to separate said portion from said interliner and expose said cap through the opening in

said box, said spout being normally retracted into said recess beneath said portion of said interliner, but being extensible through said opening by inversion of said recess when said portion is separated from said interliner.

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