

[54] **CONTAINER FOR BULK SHIPMENT OF CORROSIVE LIQUIDS OR THE LIKE**

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[22] Filed: **Feb. 19, 1971**

[21] Appl. No.: **117,007**

[52] U.S. Cl.**220/63 R, 220/66, 229/14 B,**
229/47

[51] Int. Cl.**B65d 25/14**

[58] Field of Search220/63 R, 66, 67, 73;
229/14 B, 47; 292/341.18, DIG. 60

[56] **References Cited**

UNITED STATES PATENTS

3,262,628	7/1966	Heisler et al.	220/63 R
698,755	4/1902	Stiehle	220/73
2,721,674	10/1955	Lazard	229/14 B
3,348,728	10/1967	Love	220/63 R

Primary Examiner—Joseph R. Leclair

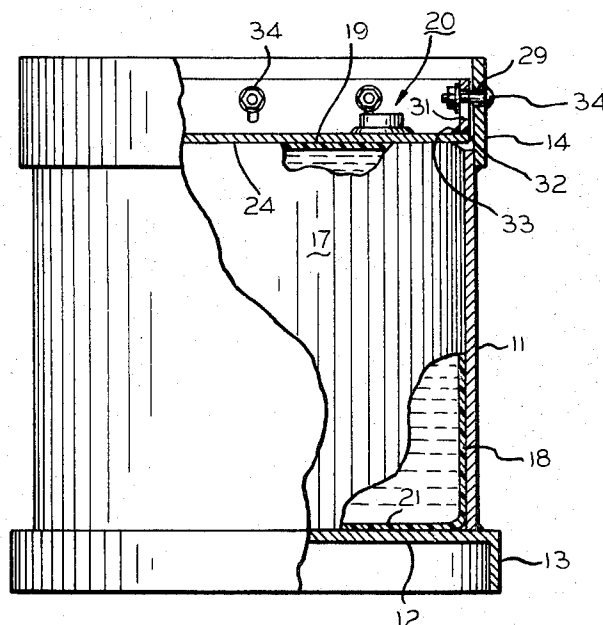
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[57] **ABSTRACT**

A container for bulk shipment is comprised of an outer rigid shell with an inner flexible hollow container liner resistant to most corrosive liquids. The liner is composed of a plastomer such as low density polyethylene or other thermoplastic having the property of cold flow when loaded, as well as compressibility under loads. The liner is provided with a filler neck and closure, and when empty it somewhat loosely fills the shell. As the liner is loaded it conforms to the inside of the shell both by elastic and plastic deformation. The top of the shell is provided with a plurality of apertures having a plurality of fastening elements extending therethrough in fastening engagement with a locking member disposed atop a shell closure resting on the loaded elastomer liner. The locking member has apertures aligned with the apertures in the shell, and the fastening members extend through both sets of apertures. One set of such apertures is elongated to provide for movement of the shell closure with the liner before the fastening means is secured. The shell closure is provided with structure for securing the same to the filler neck of the container liner, so that the liner and the shell closure may move together within the outer shell as the container liner is filled. After filling, the shell closure is secured to the locking member by the fastening elements to make a rigid structure with the filled liner secured in place.

3 Claims, 5 Drawing Figures



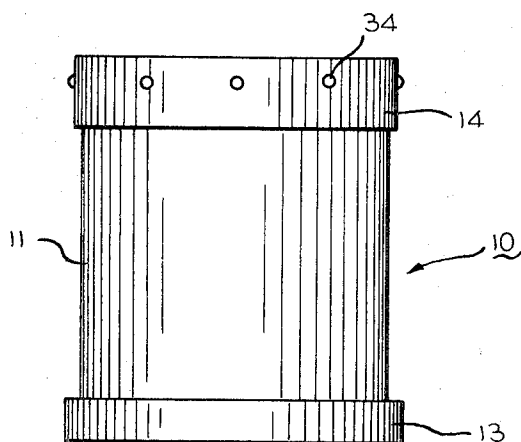


FIG. 1

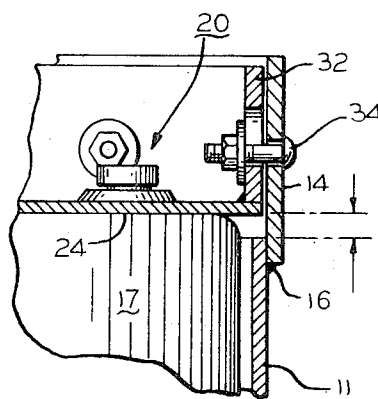


FIG. 3

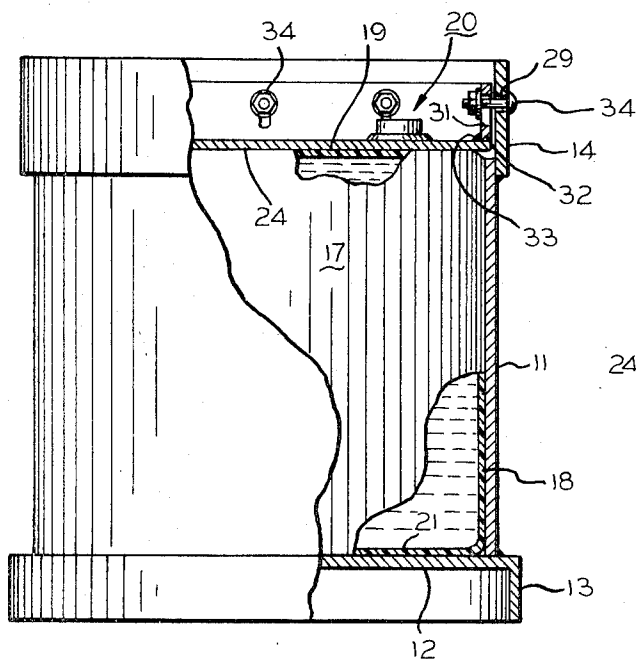


FIG. 2

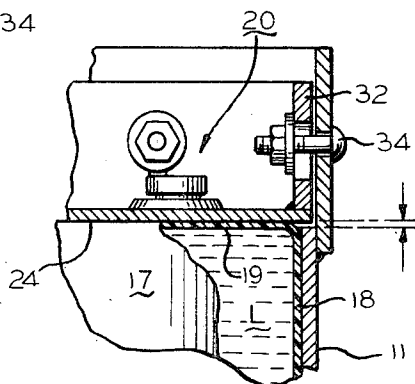


FIG. 4

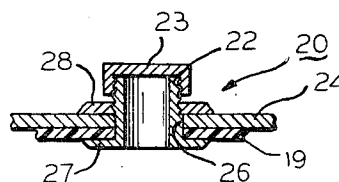


FIG. 5

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CONTAINER FOR BULK SHIPMENT OF CORROSIVE LIQUIDS OR THE LIKE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to that class of shipping containers particularly adapted for shipment of corrosive liquids or the like, where the liquid is wholly protected by a corrosion resistant liner contained within an outer rigid protective shell.

2. The Prior Art

The prior art is best exemplified by the following patents:

Heisler et al., 3,262,628, July 26, 1966, 229/14; Eisenberger et al., 2,618,409, Nov. 18, 1952, 222/103; Lazard 2,721,674, Oct. 25, 1955, 220/63; Dunlap, Jr., et al., 3,477,631, Nov. 11, 1969, 229/14; Winstead, 2,748,673, June 5, 1956, 93/35.

SUMMARY OF THE INVENTION

The invention herein relates to the bulk shipment of corrosive or other liquids within a flexible liner insert held in turn within a rigid outer shell. The flexible liner insert is in the form of a plastomer material, and during the filling thereof while in the outer protective shell the dimension thereof changes in accordance with the loading. In order to cause the filled insert to be tightly held within the outer shell, an adjustable closure is provided fitting closely against the upper closure of the tank insert. The upper closure is secured in a conventional fashion to a filler neck and the liner insert, and the top closure thereof is caused to be in firm contact with the liner insert by means of an adjustable locking member having apertures therein cooperating with apertures in the outer shell, fastening means being passed through the apertures and locked into position after the filling of the insert.

THE DRAWING

FIG. 1 is an elevational view of an improved container according to the present invention;

FIG. 2 is an elevational view to an enlarged scale, certain parts being shown in section;

FIG. 3 is a sectional view to an enlarged scale, showing details thereof for adjustably securing the top closure of the rigid shell into position;

FIG. 4 is a view similar to FIG. 3 but showing the liner as having gone through plastic and elastic deformation in the filling thereof, and showing how the top closure and the outer shell may be adjusted in position; and

FIG. 5 is a detailed sectional view showing the manner in which the closure of the outer shell is secured in position to the filler neck of the container liner.

The improvements according to the present invention are embodied in a shipping container denoted generally by the reference numeral 10 and including a rigid outer shell 11 provided with a bottom closure 12, with a pedestal 13 extending therebelow and integral therewith the top of the shell 11 is provided with a flange 14 which may be secured to the outer side of shell 11 by means of a continuous weldment 16. The dimensions are so chosen for the flange 14 and the pedestal 13 that the rigid containers 10 may be nested one atop the other.

The outer shell is adapted to surround a hollow liner or insert 17 made of a plastomer, for example, and having side walls 18, an upper closure member 19 of like material and a lower closure member 21 also of like material. The dimensions of the hollow liner 17 are so chosen that the same conforms generally in dimension to the inner dimension of the rigid shell 11, by may be readily removed therefrom after being emptied.

A filler neck referred to generally by the reference numeral 20 extends from the upper closure member 19, and has a threaded end 22 to receive a screw type closure 23. An upper closure 24 for the rigid shell 11 has an aperture 26 therein, through which the filler neck 22 extends, the filler neck having a lower flange 27 bearing against the underside of closure member 19. A locking nut 28 holds the closure 24 against the upper side of the upper closure member 19.

Before the container liner 17 is filled it fits rather loosely within the outer shell 11 as the liner is filled the dimensions thereof change by both plastic and elastic deformation, so that the sides 18 and lower closure member 21 thereof closely fit against the outer shell 11 and the lower closure 12 thereof. Such deformation causes the inner liner 17 to change its contours as seen by comparing the showing of FIG. 3 with the showing of FIG. 4, FIG. 3 showing the unfilled condition of liner 17, and FIG. 4 showing the filled condition thereof, liquid L being shown within the liner 17.

Structure is provided for adjustably securing the upper closure 24 within the shell 11 and the flange 14, and includes a plurality of spaced apertures 29 disposed near the upper end of flange 14, apertures 29 cooperate with a like group of spaced apertures 31 in a locking member 32. The latter is in sliding engagement with the interior of flange 14 and is preferably secured to upper closure 24 by weldments 33. Fastening structure in the form of through bolts indicated generally by the reference numeral 34 extend through the apertures 29 and 31 as seen in FIGS. 2, 3 and 4.

In order to provide adjusting movement of the locking member 32 either of the group of apertures 29 or 31 may be elongated in a vertical direction as the upper closure 24 changes its position in maintaining contact with upper closure 19 of liner 17.

If desired, locking member 31 need not be secured to the top closure for the shell 11 and in such cases it is caused to bear against upper closure 24 and locked in position when liner 17 is filled.

As seen in FIGS. 3 and 4, upper closure 24 is adapted to follow the movement of upper closure member 19 of the liner 17 through the filling operation as plastic and elastic deformation of liner 17 takes place. At the conclusion of filling the locking member 32 is secured by the fastening members 34.

We claim:

1. A container for the bulk shipment of liquids comprising:

- a. a rigid shell;
- b. means closing one end of said shell;
- c. hollow liner made of plastomeric material capable of simultaneous plastic and elastic deformation having side walls and upper and lower closure members of like material and conforming generally in dimension to the inner dimension of said rigid shell;
- d. a filler neck in the upper closure member of said liner;

- e. an upper closure for said rigid shell and a locking member in sliding engagement with the upper interior portions of said metallic shell;
- i. said upper closure resting upon said upper closure member of said liner;
- ii. said upper closure having an opening therein for the extension therethrough of said filler neck including means for securing said upper closure to said filler neck at said opening;
- f means adjustably securing said upper closure to said shell responsive to plastic and elastic deformation of said liner in conforming to the inner dimensions of said metallic shell when said liner is filled while in said shell comprising:
- i. a group of spaced apertures disposed at the upper end of said shell and cooperating with a group of aligned apertures in said locking

- member;
- ii. one of said group of apertures being elongated to accommodate movement of said upper closure in the filling of said hollow liner while disposed within said shell;
- iii. fastening means extending through said apertures and holding said upper closure in position to said shell following the filling of said hollow liner.
2. A container according to claim 1 wherein said locking member is integral with said upper closure for said shell.
3. A container according to claim 1 with said locking member is in the form of a flange integral with said upper closure.

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