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COLLAPSIBLE CONTAINER

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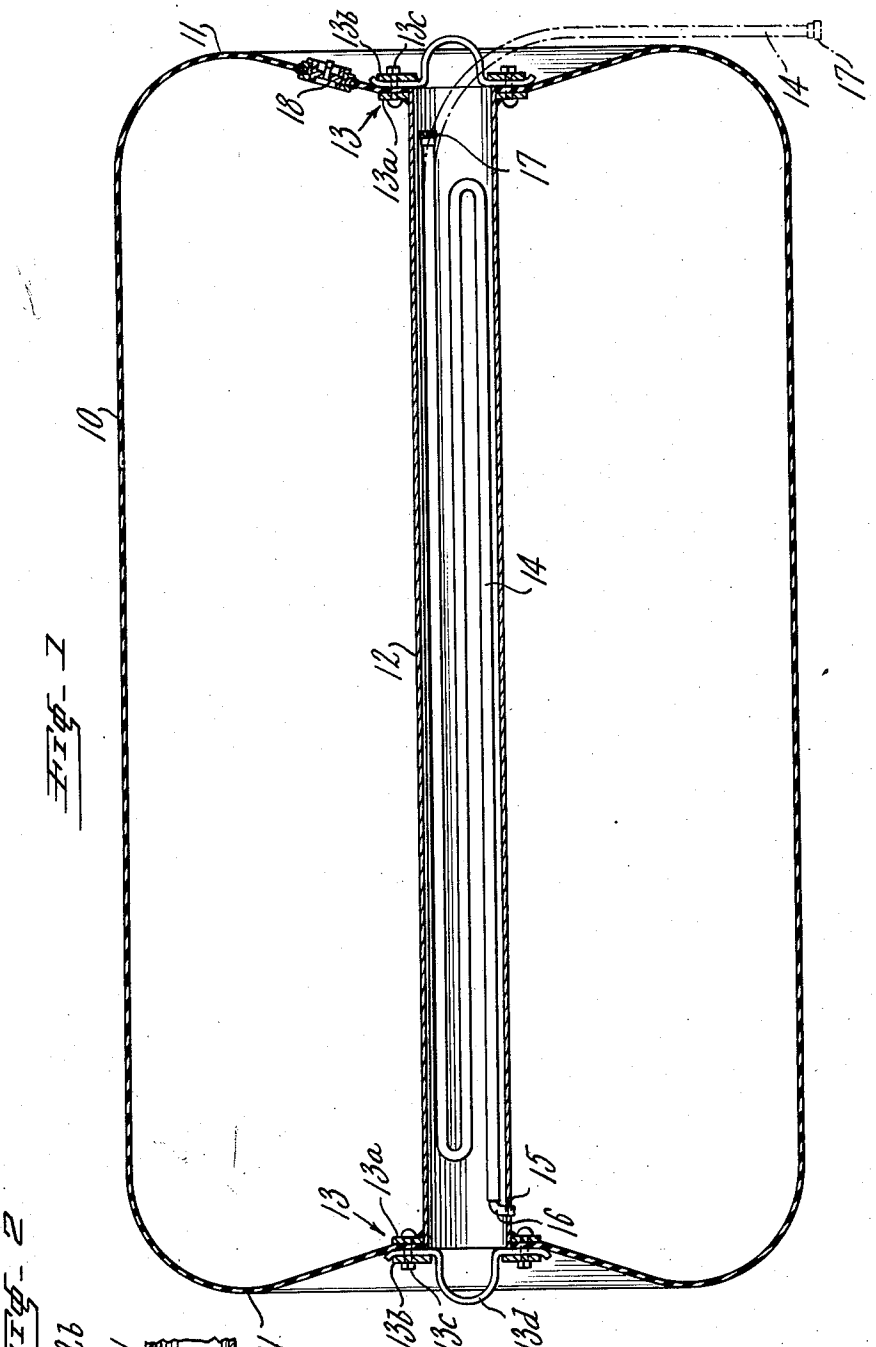


FIG. 1

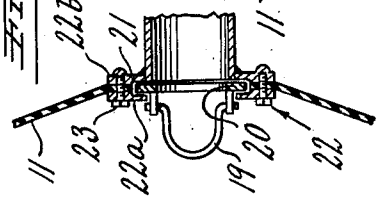


FIG. 2

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COLLAPSIBLE CONTAINER

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6 Claims. (Cl. 150—1)

This invention relates to a collapsible container for liquids such as gasoline, oil, water, chemicals and foodstuffs.

The primary object of the invention is to provide a collapsible container of a construction which will facilitate the handling of the filled container and the dispensing of the liquids therefrom.

To this end, the container is formed of flexible, liquid impervious material, such as rubberized cord fabric and is of a generally cylindrical shape when filled and expanded. The container is provided with a hollow rigid tube, open at least at one end, which extends internally of the container from one end theerof to the other and is rigidly secured to end fittings attached to central portions of each end of the container. This rigid tube provides at least three functions. First, it provides a storage place for a length of flexible hose which is connected to the container and which can be used in emptying the container. Secondly, it provides the filled container with longitudinal rigidity to thereby permit the container to be rolled or dragged by means of cables attached to the end fittings, and thirdly, the rigid tube takes the load of the container when the container is lifted from one end.

In accordance with the invention, the end of the length of hose is permanently secured to an opening through the wall of the rigid tube. The other end of the hose is provided with a clamp or other suitable closure for closing off the hose. To empty the container, the length of hose is extended from its storage space within the tube and the clamp or closure released to permit the liquid from the container to flow through the opening through the wall of the rigid tube and out through the hose. The liquid may be withdrawn from the container by means of a pump attached to the hose or may be siphoned out of the container through the hose.

Other objects and advantages of the present invention will become apparent from the following description when read in conjunction with the accompanying drawings wherein:

Fig. 1 is a sectional view of the collapsible container of the present invention, and

Fig. 2 is a partial sectional view showing an alternate form of end fitting for the container.

Referring to the drawings, and in particular to Fig. 1, the container of the present invention, when filled and expanded, is of generally cylindrical shape. The cylindrical body portion **10** and the end or head portions **11** are conveniently formed of plies of rubberized cord fabric, either textile or wire and fabric, in the manner described in U. S. Patent Nos. 2,612,924 and 2,672,902, though it will be appreciated that other liquid impervious flexible materials, such as some types of sheet plastics may be used.

For storing liquid foodstuffs and fuels, a neoprene rubber is particularly suitable as the coating rubber for the cord fabric plies, particularly the inner surface of the innermost ply, as neoprene does not impart an objectionable taste to the foodstuffs and is not adversely effected by fuel such as gasoline and oil.

In accordance with the invention, the container is provided with a rigid, hollow tube **12** of metal or other suitable rigid material. The tube **12** extends internally of the container from one end thereof to the other end and is rigidly secured to fittings **13** attached to central portions of each of the ends **11**.

Each fitting **13** includes an inner annular plate **13***a* and an outer annular plate **13***b* between which the walls of the container surrounding an opening through the ends **11** are clamped by means of bolts **13***c* which extend through the outer plate and thread into the inner plate.

The ends of the tube **12** are rigidly secured to the inner plates **13***a* by welding or by being threaded therein so as to form a fluid tight seal therebetween and to prevent cocking of the fittings **13** in the ends of the container. The outer plates **13***b* carry pivotally mounted D-rings **13***d* by which the container may be lifted, dragged or rolled by the attachment of cables or the like thereto. The rigid tube **12** provides the container with rigidity against longitudinal bending, thereby permitting the container to be rolled or dragged by cables attached to the rings **13***d*. The tube **12** also takes the load when the filled container is lifted from one end.

The tube **12** also provides a storage space for a length of flexible emptying hose **14**, when the hose is not in use. The tube **12** has an opening **15** through the wall thereof communicating with the interior of a container and one end of the hose is attached to the opening **15** by a suitable fitting **16**. A clamp **17** or other suitable closure is provided at the other end of the hose for selectively closing or opening the hose. The hose is of a much smaller diameter than the tube **12** so that a substantial length of hose can be stored within the tube by folding the hose as illustrated in Fig. 1.

When it is desired to empty the container, the hose is pulled out through the open end of the tube **12** and the clamp or closure released so that the liquid can flow out through the hose. The liquid can be withdrawn from the container by a pump attached to the hose or may be siphoned out of the container by means of the hose. As the liquid is withdrawn the container collapses due to the negative pressure created therein thereby insuring complete emptying of the container. No venting of the container during emptying is necessary. The container can be filled either through the hose or through a separate filling opening **18** provided in one of the ends **11**.

In Fig. 2 there is shown an alternate form of end fitting for the container shown in Fig. 1. In this form, the D-rings have a swivel or rotary connection with the end fittings so that they can freely turn thereby facilitating the rolling of the container by cables, chains or the like attached thereto.

As shown in Fig. 2 the D-ring **19** is pivotally attached to an annular swivel plate **20**. The swivel plate **20** in turn is journaled in an annular space **21** formed between an outer annular plate **22***a* and an inner annular plate **22***b* forming the end fitting **22** for the container. The container wall surrounding the opening through the ends of the container is clamped between the outer annular plate **22***a* and the inner annular plate **22***b* by clamping bolts **23** which extend through the outer plate **22***a* and threads into the inner plate **22***b*. The end of the tube **12** is rigidly secured to the inner plate **22***b*.

From the above description, it can be seen that there is provided an improved collapsible container which may be easily moved without the necessity of expensive lifting equipment. To move the container, it is only necessary to attach cables to the D-rings at each end of a container and pull the container along the ground by

means of any available vehicle. In lifting, connection is made only to one end of the container so that the load is carried axially by the tube 12. Inasmuch as the container carries its own emptying tube, the container may be easily emptied. Conveniently a number of the filled containers can be transported on a flat-bed truck, with the containers disposed transversely of the bed with their ends adjacent the side of the truck. In this manner, the containers may be emptied without removal thereof from the truck merely by pulling the emptying hoses thereof from within the rigid tubes.

While certain preferred forms of the invention have been shown and described, it is to be understood that this is for the purpose of illustration only and that modifications could be made therein without departing from the spirit and scope of the invention.

Having thus described my invention, what I claim and desire to protect by Letters Patent is:

1. A collapsible container having a generally cylindrical body portion and end portions of a flexible liquid impervious material, a rigid tube extending internally of the container from one end thereof to the other, said rigid tube being rigidly secured at each end to rigid fittings attached to the center portion of each of said end portions of the container, said rigid tube having at least one end open to the exterior of the container, said rigid tube having an opening through the wall thereof communicating with the interior of the container, a hose secured to said opening, said hose being of a length to extend a substantial distance out of the open end of the tube and being adapted to be folded and stored in said tube when not in use, and attaching rings secured to each of said fittings externally of the container.

2. A collapsible container having a generally cylindrical body portion and end portions of a flexible liquid impervious material, a rigid tube extending internally of the container from one end thereof to the other, said rigid tube being secured at each end to the central portion of each of said end portions of the container and having at least one end open to the exterior of the container, said tube having an opening through the wall thereof communicating with the interior of the container, a hose secured to said opening, said hose being of a length to extend a substantial distance out of the open end of the tube and being adapted to be folded and stored in said tube when not in use, the free end of said hose having closure means for opening and closing said hose.

3. A collapsible container having a generally cylindrical body portion and end portions of a flexible liquid impervious material, a rigid tube extending internally of the container from one end thereof to the other, said rigid tube being secured at each end to a central portion of each of said end portions of the container and having at least one end open to the exterior of the container, and means for filling and emptying said container.

4. A collapsible container having a generally cylindrical body portion and end portions of a flexible liquid impervious material, a rigid tube extending internally of the container from one end thereof to the other, said rigid tube being secured to each end to rigid end fittings attached to the center portion of each of said end portions of the container, and said rigid tube having at least one end thereof open to the exterior of the container, and means for filling and emptying said container.

5. A collapsible container having a generally cylindrical body portion and end portions of a flexible liquid impervious material, a rigid hollow member extending internally of the container from one end thereof to the other, said rigid member being rigidly secured at each end to rigid end fittings attached to the center portion of each of each of said end portions of the container and a ring member rotatably secured to each of said fittings for rotation in a plane perpendicular to the axis of said rigid member, and means for filling and emptying said container.

6. A collapsible container having a generally cylindrical body portion and end portions of a flexible liquid impervious material, a rigid hollow member extending internally of the container from one end thereof to the other and secured at each end to center portions of the end portions of the container, attaching means rotatably secured to each end of said rigid member for rotation in a plane perpendicular to the axis of said rigid member, and means for filling and emptying said container.

References Cited in the file of this patent

UNITED STATES PATENTS

336,981	Bartlett	Mar. 2, 1886
1,535,308	Hele-Shaw et al.	Apr. 28, 1925
2,622,645	Pfleumer	Dec. 23, 1952
2,637,862	Freas	May 12, 1953
2,677,406	Cunningham	May 4, 1954