June 8, 1965 J. RODISH 3,187,974

DRUM FOR CONTAINING LIQUIDS

Filed Dec. 26, 1961 2 Sheets-Sheet 1

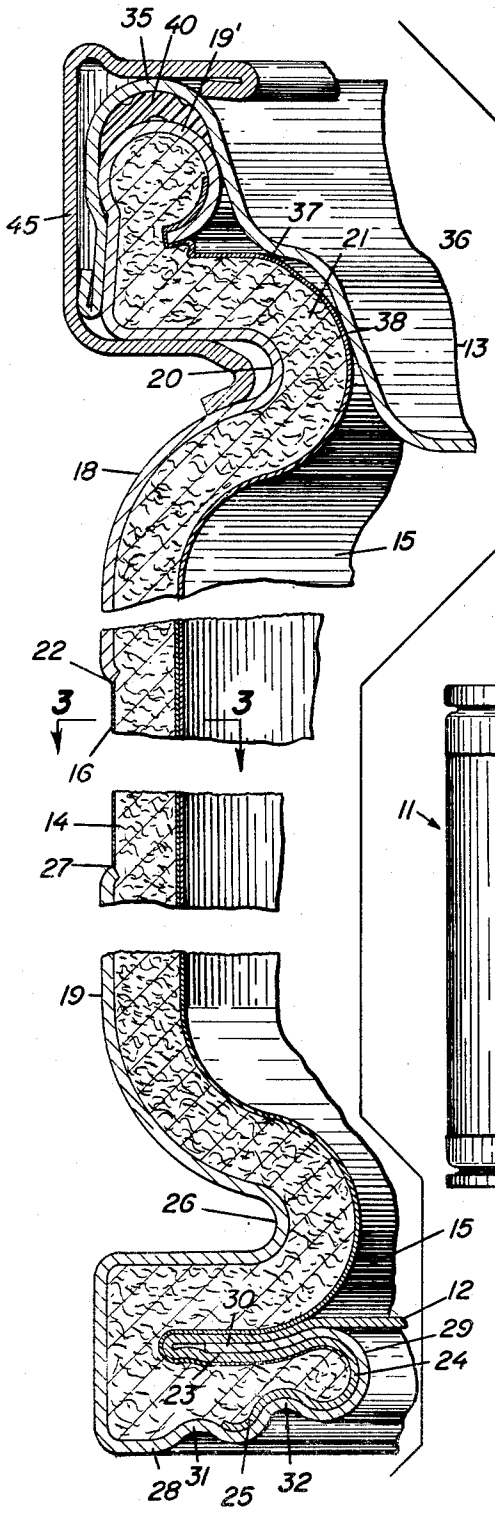


Fig. 2

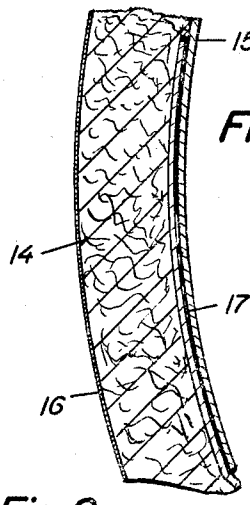


Fig. 3

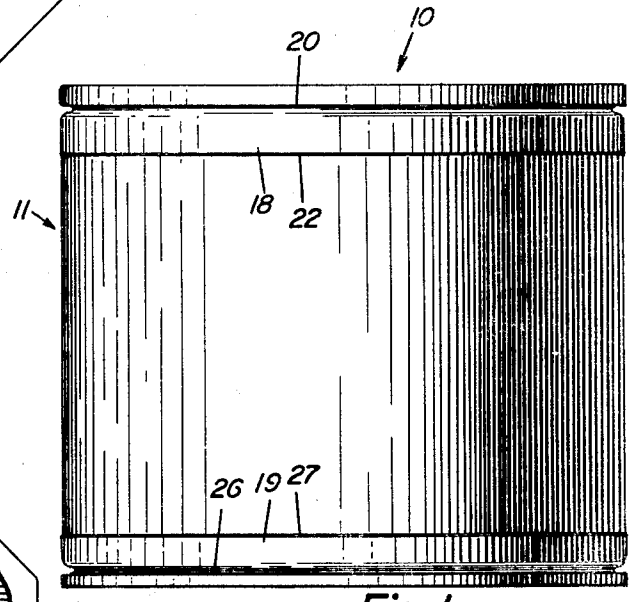


Fig. 1

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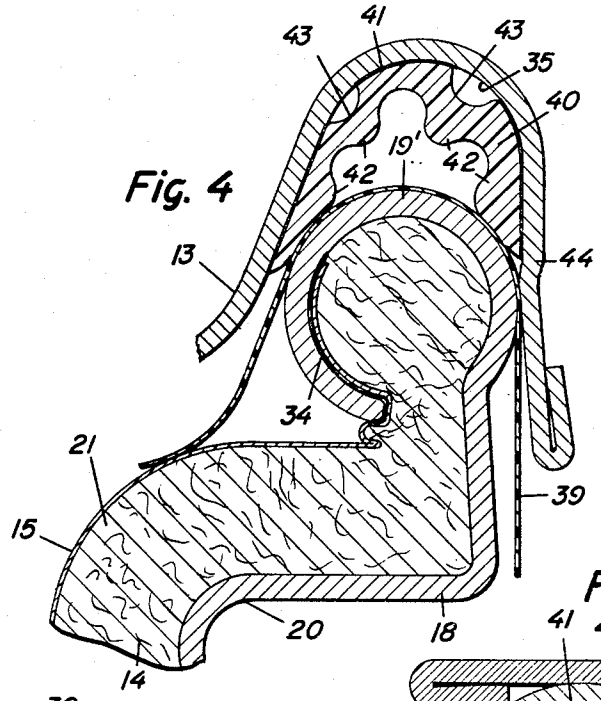


Fig. 4

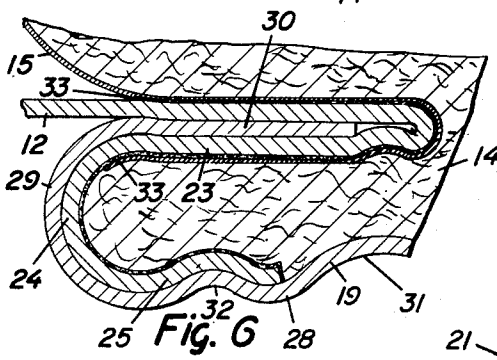
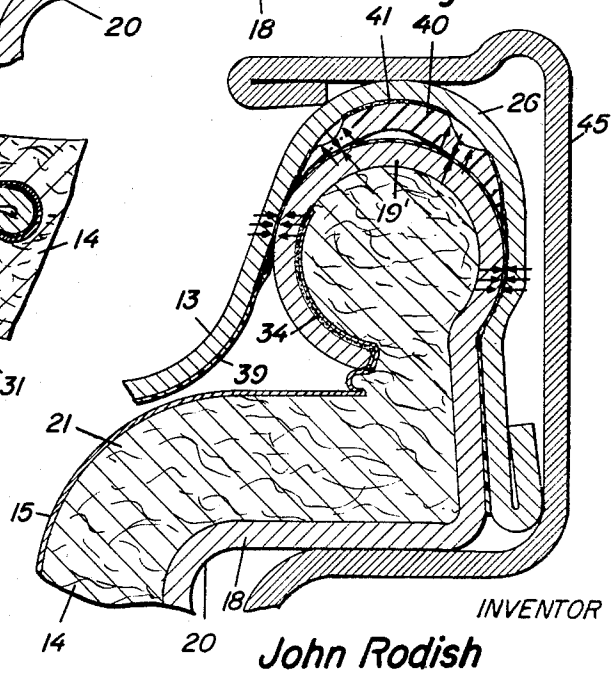


Fig. 6

Fig. 5



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DRUM FOR CONTAINING LIQUIDS

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1 Claim. (Cl. 229—5.7)

The present invention relates to a drum for containing liquids.

Generally, in accordance with this invention, there is provided a drum for containing liquids or semi-liquids, the body of the drum being lined with thin gage aluminum, thin-coated steel, stainless steel or the like. The drum is further provided with a sheet metal bottom and a removable cover. A poly disc is positioned between the cover and the upper end portion of the drum. In addition, the drum is provided with unusually wide top and bottom chimes to give additional strength. A compressible gasket is mounted between the cover and the upper edge portion of the drum over the aforesaid poly disc. Various novel features are incorporated in the structure and the device is such that the body portion of the drum may be formed of fiber board while the inner lining referred to prevents saturation or penetration of such body by the contained liquid. The exposed portions of the structure are provided with suitable coatings to prevent moisture from penetrating or rusting the component parts of the same.

It is, accordingly, an object of the invention to provide a novel drum structure for containing liquids and semi-liquids.

Another object of the invention is to provide, in a device of the character set forth, a novel metallic lining forming a part of the invention.

A further object of the invention is the provision of novel means for joining the edge portions of the liner material forming a part of the invention.

Still another object of the invention is the provision, in a device of the character set forth, of a novel gasket forming a part of the invention.

A still further object of the invention is the provision, in a device of the character set forth, of novel sealing means interposed between the bottom and sides of the drum forming the present invention.

Another object of the invention is the provision, in a device of the character set forth, of novel sealing means interposed between the upper portion thereof and a cover forming a part of the invention.

Other and further objects of the invention will become apparent from a reading of the following specification, taken in conjunction with the drawings, in which:

FIGURE 1 is an elevational view of an embodiment of the invention;

FIGURE 2 is an enlarged, exploded, fragmentary sectional view of the device illustrated in FIGURE 1;

FIGURE 3 is a further enlarged fragmentary sectional view, taken substantially along line 3—3 of FIGURE 2;

FIGURE 4 is an enlarged fragmentary vertical sectional view of the upper portion of a container, cover and gasket therefor, illustrating the same prior to forcing the cover into position upon the drum;

FIGURE 5 is a view similar to FIGURE 4 but illustrating the cover in locked position upon the drum and with a lock ring mounted thereover; and

FIGURE 6 is an enlarged fragmentary vertical sectional view illustrating the juncture between the bottom wall and side walls of the device of the invention.

Referring to the drawings, there is shown therein a container generally designated at **10** having side walls generally designated at **11**, a bottom wall **12** and a removable cover **13**.

Referring to FIGURE 2, it will be seen that side walls **11** are composed of a body **14** of a material such as fiberboard having an inner liner **15** formed of a single ply of thin gage aluminum, tin-coated steel, stainless steel or the like and having an outer coating of basic thermosetting acrylic emulsion indicated at **16**.

In constructing side walls **11** of the drum, the liner **15** is first placed upon a mandrel in such a manner that the edge portions overlap for a distance of about one inch, as shown in FIGURE 3, the overlapped portion being joined by a heat and pressure sensitive adhesive **17**, such adhesive preferably being a heat reactivated, nitrile rubber base, metal-to-metal sealing compound. When liner **15** has thus been assembled upon the mandrel, the fiber board plies are wound around the liner convolutely until the desired thickness required for strength is obtained. The overlapped portion of the liner and its adhesive **17** is then subjected to heat and pressure to form a liquid tight seal upon the liner at this joined surface. It is also contemplated that this joint, instead of being overlapped as described, may be in some cases welded or otherwise joined together in a liquid tight joint.

The upper end portion of container **10** is reinforced and shaped by a continuous upper chime **18** and the lower end portion of the container is provided with a lower chime **19**, the chimes **18** and **19** being of greater than usual width to provide additional strength to the completed drum.

As shown in my co-pending application Serial No. 54,298, filed on September 6, 1960, now Patent No. 3,107,037, upper chime **18** is rolled inwardly and downwardly over the upper edge portion of cylinder walls **11** to form a bead **19'** and at the same time to lock the upper edge portion of liner **15** to the fiber-board **14**. Chime **18** is inwardly and upwardly crimped as indicated at **20** to produce the cover-engaging seat **21**. The lower edge of chime **18** is pressed inwardly, as indicated at **22** (see FIGURE 2) both for anchoring the same to the outer surface of wall **11** and to produce a substantially flush surface therewith.

Referring to FIGURES 1, 2 and 6, it will be seen that bottom chime member **19** is employed to connect the body **12** to the bottom edge portion of the walls **11** and to reinforce the bottom member **12**. Bottom **12** is provided with an inwardly and downwardly extending flange **23** terminating in a channel member **24**, the lower leg of which is indicated at **25**.

Chime **19** is crimped inwardly, as indicated at **26**, and the upper edge of chime **19** is crimped inwardly, as indicated at **27**, to anchor same to the wall structure **11**.

The lower portion of chime **19** is provided with an inwardly extending wall **28** terminating in an upwardly and outwardly extending annular channel member **29**, the upper leg **30** of which extends between wall **12** and flange portion **23** thereof. Annular convolutions **31** and **32** are formed in wall **28** and serve to further strengthen and rigidify the joint between wall structure **12** and wall structure **11** and the component parts thereof to thereby improve the effectiveness of the joint and the seal inherent therewith. Moreover, to more effectively provide additional bottom sealing, the inwardly extending wall **28** at the protruding portion bearing the marking "28" in FIGURE 6 of the drawing may be extended so as to carry the full weight of the loaded container **10**.

As best shown in FIGURE 6, a sealing compound **33** having a nonhardening latex base is interposed between cover **12** and the lower portion of liner **16** and exposed lower portions of fiber-board **14**. A like sealing compound (see FIGURE 4), indicated at **34**, is placed between the inner face of liner **15** and that portion of bead **19** which encompasses the same.

Cover **13** is provided in its peripheral portion with a

downwardly opening channel **35** to encompass bead portion **19'** of upper chime **18** and thence extends downwardly to the center portion of such cover **13**, the downwardly extending portion having an annular convolution **36** (FIGURE 2) which provides two points of contact, indicated at **37** and **38**, with seal **21**. A poly disc **39** of flexible rubber or the like is laid over container **10** in such manner as to encompass bead **19'**, the entire open upper end of the container and extends downwardly on the outer side thereof, all as indicated in FIGURE 4, prior to placing cover **13** in position upon the container **10**.

An annular gasket **40** is affixed in channel **35** by an adhesive **41** and is provided on its underside with a series of radially spaced circumferentially extending annular ridges **42** and upon its upper side with a series of radially spaced, circumferentially extending annular grooves **43**.

Cover **13** has integrally formed therewith in its peripheral portion a dependent flange **44** and a lock ring **45** which is adapted to encompass the peripheral portion of cover **13** and the upper portion of side walls **11** to lock the cover upon the container in conventional manner.

The exposed metal portions of the device, including long ring **45**, cover **13**, top and bottom chime members **18** and **19** and bottom **12** are all provided with a protective coating which is weather-resistant and preferably formed of a modified epoxy amino thermo-setting, such coating not being shown in the drawings.

It will thus be seen that there has been provided a container which is not only weather-resistant but which is adapted to contain liquids and semi-liquids such as, for example, asphalt or the like in a leakproof condition, it being apparent that the recited structure will afford sufficient strength for such purpose and that the inner lining of foil above described will prevent the contained liquid from penetrating the body of fiber board. It will also be seen that poly disc **39** will, in itself, add to the effectiveness of the seal between cover **14** and the upper portion of the container. To further assure a liquid tight seal between the cover and the container, it will be apparent that gasket **40** would be compressed in the manner illustrated in FIGURE 5 and that when such compression takes place as indicated by the arrows in FIGURE 5, the ridges **42** will be compressed toward an arcuate shape while grooves **43** will be compressed to occupy less space, so that, when cover **13** is again removed from the container, the gasket will return to its normal condition and shape as indicated in FIGURE 4. In the compressed condition indicated in FIGURE 5, however, it will be apparent that there is provided a plurality of annularly extending pressure points to further insure against any possible leakage of the contained liquid from within the container **10**.

While but one form of the invention has been shown and described herein, it will be readily apparent to those skilled in the art that many modifications may be made without departing from the spirit of the invention or the scope of the appended claim.

What is claimed is:

A drum for containing liquids comprising a cylindrical container having an annular open-ended side wall formed of multi-ply fiber-board, an inner liner of thin gauge aluminum and an outer coating of thermosetting acrylic emulsion, the edge portions of the liner being reverted and overlapped and secured by pressure sensitive adhesive and a heat seal, the upper and lower end portions of the container wall having continuous chimes thereabout, the upper chime being inwardly and downwardly rolled to form a bead and inwardly and upwardly crimped to produce an internal cover supporting seat, the lower edge of the upper chime being pressed inwardly and crimped to anchor the same in flush relation to the outer surface of the wall of the drum, a bottom member closing the open bottom of said container and including an inwardly and downwardly extending flange terminating in a channel member, the lower portion of the lower chime having an inwardly extending wall terminating in an upwardly and outwardly extending annular channel member the upper leg of which extends between the bottom member and the inwardly and downwardly extending flange thereof, said last mentioned inwardly extending wall having annular convolutions therein, a sealing compound interposed between the bottom member and the lower portion of the inner liner, an additional sealing compound between the inner face of the inner liner and the bead of the upper chime, a top cover member for closing the open top of the container and having a downwardly opening channel overlying the upper portion of the bead of the upper chime, the downwardly extending side wall of the last mentioned channel having an annular convolution thereabout, a disc of flexible rubber overlying the top of the container below the top cover and overlying the bead of the upper chime and extending downwardly about the side wall of the container, a compressible annular gasket in the downwardly extending channel of the top cover, said gasket having circumferentially extending annular ridges on its upper side and a series of circumferentially extending annular grooves on its under side, said gasket seating on said bead of said upper chime and overlying said disc, a depending peripheral flange on the top cover overlying said upper chime, and a lock ring including an upper horizontal flange overlying the top of said downwardly extending groove of said top, a vertical portion surrounding said depending peripheral flange on said top cover, and a second horizontal flange extending inwardly into the exterior of the inwardly crimped portion of the upper chime.

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