

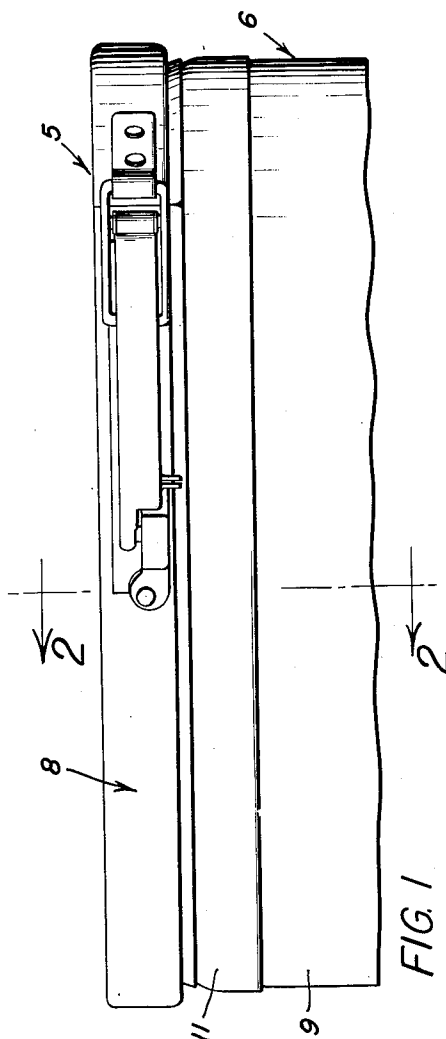
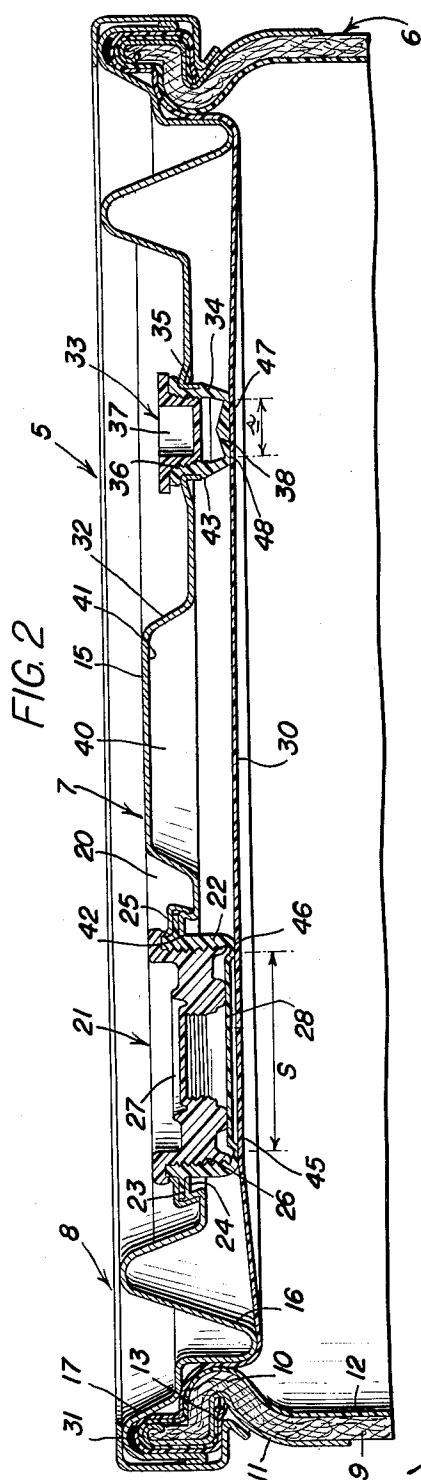
June 20, 1961

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2,989,208

CONTAINER AND COVER ASSEMBLY FOR CORROSIVE MATERIALS.

Filed April 24, 1958



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CONTAINER AND COVER ASSEMBLY FOR CORROSIVE MATERIALS

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Filed Apr. 24, 1958, Ser. No. 730,644

9 Claims. (Cl. 220-27)

This invention relates generally to containers employed for shipping, storing or dispensing corrosive liquids, and more particularly to a container and cover combination that may be employed for such purposes.

One of the primary objects of the invention is to provide a novel arrangement for protecting the metal cover on a fiber or metal container or drum from corrosive contents in the container when the cover is provided with fittings for filling, emptying or venting the container.

Another object is to provide a novel combination container and cover structure that is effective for preventing a metal cover from contaminating corrosive liquid contents of a container, as well as preventing the cover from being attacked by the contents either before or after closure seals have been broken.

In utilizing conventional fiber or metal containers and covers for shipping corrosive liquids, a common practice has been to coat the interior surfaces of the drum and cover with chemically resistant coatings such as epoxies, vinyls, phenolics, etc., but if there is an imperfection or pinhole in the coating, or it becomes scratched or damaged, the product can attack the body material of the drum or cover, and the resulting rust can contaminate the contents to an extent that may make the liquid useless. Pinholes and imperfections in the liner coating of a drum can readily be eliminated by applying several coats of the chemically resistant liner material, but multiple coatings on a cover cannot be relied on to be effective because they are frequently scratched during handling.

Furthermore, imperfections in coatings on formed covers that are drawn with ribs or beads are common because the stretched part of the metal is more difficult to coat than covers with flat tops.

Punching a metal cover with holes and drawing it for attaching bung and vent plug fittings exposes sheared edges of the cover on the inner side thereof that are difficult to coat with a protective coating, and hence are very vulnerable to rusting.

There are some products, such as ammonia, acetic acid, lactic acid, etc., that are difficult to hold with coatings on steel. A plastic film or membrane disposed between the container and the cover has advantages in that it is more economical than the multi-coat chemically resistant varnish required on a metal cover to prevent chemical attack, and inherently is more corrosion resistant and flexible, thereby being less liable to damage during shipment.

Heretofore, a disadvantage in utilizing a plastic sealing disk or film with a cover equipped with bung or vent plug fittings was that the contents of the drum could not be dispensed without puncturing the plastic membrane and thereby exposing the metal of the cover to the corrosive contents of the drum. Furthermore, puncturing the plastic membrane or partition permitted a portion of the contents to flow into the space between the membrane and the cover where it became trapped and could not readily be removed, consequently it became wasted.

An effective solution has been found in placing a thermoplastic sealing disk or film over the inner face of the cover and attaching it to the inner ends of the bung and vent fittings fastened in the cover. The bung and vent fittings are also of a thermoplastic material so that the film may be heat sealed thereto.

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A consequent object is to provide a container cover having attached thermoplastic fittings with a protective thermoplastic undercover therefor which is attached to the fittings so that when the fittings and undercover are opened, the inner surface of the cover will not be exposed.

A further object is to provide a container cover with thermoplastic fittings and a protective membrane over the inner surface thereof which may be of a laminated material having the outermost lamina of a thermoplastic material heat sealed to the fittings, and the innermost lamina of a different material.

With the above and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the following detailed description, the appended claims and the several views illustrated in the accompanying drawing.

In the drawing:

FIGURE 1 is a fragmentary elevation illustrating the upper portion of a container incorporating the invention.

FIGURE 2 is an enlarged vertical section taken on line 2-2 of FIGURE 1.

Referring to the drawing in detail, indicated generally at 5 is a container, in the preferred embodiment including a body member 6 of the character disclosed in U.S. Letters Patent 2,727,673. Indicated generally at 7 is an improved cover assembly, the same being maintained in sealed relationship on the body member by means of a removable clamp ring assembly indicated generally at 8 and of the character disclosed in detail in U.S. Letters Patent to H. A. Scott et al. 2,795,975, issued December 25, 1951.

The body member 6 includes a cylindrical convolutely wound body wall 9 sealingly secured to a suitable bottom heading of the character disclosed in the Bergstrom patent, for example, and the upper edge of said body wall includes an inwardly turned annular bead 10 protected by an annular metal chime 11. The inner surface of the bottom heading (not shown) will include an impervious polyethylene liner or shield of the character disclosed in U.S. Letters Patent to Bergstrom 2,775,384, issued December 25, 1956, and the inner surface of the body wall 9 will incorporate a polyethylene liner 12 which extends over the upper edge of the body wall overlying the chime 11 to be ultimately disposed beneath a shoulder portion 13 of the body member as clearly shown in FIGURE 2.

The cover assembly 7 comprises a metal lid member 15 incorporating an annular rib 16 dimensioned to fit within the inner surface of the bead 10 of the body member and spaced inwardly of a downwardly opening peripheral channel 17 engageable over the upper edge of the body wall of the body member. The clamp ring assembly 8 is of the expansible type and functions to clampingly engage and retain the lid member in sealed relationship with the body member as is conventional in the art and disclosed in detail in the patent to Scott et al.

Incorporated in an annular recessed portion 20 of the lid member 15 is a bung assembly indicated generally at 21 of the character disclosed in detail in U.S. Letters Patent 2,772,017. The bung assembly includes a polyethylene tubular mounting sleeve 22 extending through an apertured portion in the recess 20 and incorporating an annular flange 23 disposed upon a suitable shoulder or flange 24 of the apertured portion of the lid member. An annular clamp ring 25 overlies the flange 23 and shoulder 24. The sleeve 22 is internally threaded as indicated at 26, receiving therein a removable plug 27. The sleeve 22 is of a severable material incorporating a transverse removable plug portion 28 which will be cut out when the plug 27 is removed to obtain access to the contents of the container. Extending across the inner surface of the lid member 15 is an impervious shield or sealing disc 30 of polyethylene, or any other suitable material, portions of which extend over adjacent portions of the

liner 12 of the body member adjacent the annular rib 16. A suitable sealing gasket 31 may be incorporated in the channel 17 of the lid member so as to be disposed on top of the portion of the sealing disc 30 which extends over the upper edge of the body wall 9 of the container.

A second recessed portion 32 of the lid member includes therein a vent assembly indicated generally at 33 and being of the character disclosed in detail in U.S. Letters Patent 2,785,865. The vent assembly 33 includes a tubular mounting sleeve 34 of polyethylene or any similar material fixed on a flanged portion 35 of the lid member. The sleeve 34 is internally threaded at 36 receiving therein a removable plug 37. The sleeve 34 incorporates a transverse severable plug portion 38 to be removed for the purpose of permitting entry of air into the container when the material contained therein is being dispensed.

The portion 45 of the sealing disc immediately below the plug portion 28 will be heat-fused at 46 to the sleeve 22 of the bung assembly. Thus when the portions indicated at S comprising the bung plug portion 28 and sealing disc portion 45 are cut away, the sealing disc 30 will continue to be sealed at 46 to the sleeve preventing the contents of the container from entering the space 40. The portion 47 of the sealing disc which is immediately below the vent plug portion 38 of the sleeve 34 will also be heat sealed or fused at 48 to the sleeve, and when the portions 38 and 48 as indicated at s are cut away the lower portion of the sleeve 34 will still be sealingly secured to the disc 30 also preventing the contents of the container from entering the space 40. Additionally, the sealing disc 30 preferably is not held too taut in order to minimize any tendency for it to split or crack. The sealing disk 30 thus defines the upper limit of the container and prevents the loss of material in the space 40 which would otherwise occur if the seals at 46 and 48 were not employed.

Although the inner surface 41 of the lid member 15 may have been coated with various coating materials previously mentioned, in lieu of providing an impervious thermoplastic undercover, imperfections or scratches in the coating could still exist, exposing the metal of the lid member to corrosion and ultimate contamination of the contents in the container. Even if the coating on the inner surface 41 is adequate for the purpose intended, the edge 42 of the shoulder portion 24 of the lid member and edge 43 of the flange 35 of the lid member, which are extremely difficult to coat, would still be exposed to the corrosive effect of the contents of the container and ultimate contamination thereof. Additionally, a considerable amount of the material would remain in the space 40 and would not be available for use.

Although polyethylene is specifically mentioned as a preferred material for the liner, sealing disc and sleeve of the bung and vent assemblies, other suitable corrosion-resistant and impervious material may be utilized. Furthermore, although specific bung and vent assemblies are disclosed in the preferred embodiment, other fittings including a lower end depending into a container may be utilized.

In review, utilization of the liner and sealing disc eliminates the time and expense and danger of imperfections resulting during the application of chemical-resistant coatings, which, even after having been prepared in a perfect condition, are subject to scratching and other damage during handling. Usually, drawn covers of the character involved, include portions which are not susceptible to coating, and certain products to be packaged such as ammonia, acetic acid, lactic acid, etc. are difficult to retain in a pure and unadulterated condition with any type of coating on steel, or similar metals. The novel container and cover assembly, described above, not only protects the contents in the container, but makes it possible for partial dispensing of the contents with the

remaining portion maintained in its pure and unadulterated condition.

The construction shown embodies the invention in a preferred form, but it is intended that the disclosure be illustrative rather than definitive, the invention being defined in the claims.

I claim:

1. For use on a container for corrosive liquids or semi-liquids, a cover assembly for sealingly engaging the container after it is filled with a corrosive material, said cover assembly including the lid member of a composition subject to corrosion by the material in the container or which will contaminate the contents of the container, dispensing means on said lid member including a portion to be disposed within the container when it is sealed, and an uninterrupted impervious corrosion-resistant disc extending across the inner surface of the lid member below said dispensing means for sealingly engaging the container with which the cover assembly is used, said portion of the dispensing means to be disposed within the container being sealingly secured to an adjacent portion of said disc for preventing contact of any portion of the inner surface of said lid member with the contents of the container.

2. In a cover assembly as set forth in claim 1 in which said dispensing means comprises bung and vent assemblies, portions of the bung and vent assemblies being sealingly secured to the adjacent portions of said disc and comprising removable portions for permitting access to the contents of the container with which the cover assembly is used, remaining adjacent portions of said bung and vent assemblies and disc being sealingly secured to each other for preventing the corrosive contents in the container from ever coming in contact with the adjacent surface of said lid member.

3. In a cover assembly as set forth in claim 2 in which said adjacent portions of said bung and vent assemblies and disc are fused to each other and comprise a severable material.

4. A container for corrosive material comprising a body member terminating in a coplanar upper edge, a cover assembly sealingly secured on said upper edge, a corrosion-resistant impervious liner in said body member extending over the upper edge thereof, said cover assembly including a lid member sealingly engaging the upper edge of the body member, an uninterrupted impervious corrosion-resistant disc across the inner surface of said lid member sealingly engaged at the upper edge of said body member, and means on said lid member for dispensing the contents of the container, said means comprising at least one opening through said lid member including a fitting incorporating a removable closure element, said impervious disc extending below said fitting and said fitting including a portion within said container sealingly engaged to the impervious disc, adjacent portions of said fitting and disc including removable portions providing access to the contents of the container and maintaining the contents of the container out of contact with the inner surface of said lid member.

5. A container for corrosive material comprising a body member terminating in a coplanar upper edge, a cover assembly sealingly secured on said upper edge, a corrosion-resistant impervious liner in said body member extending over the upper edge thereof, said cover assembly including a lid member sealingly engaging the upper edge of the body member, an impervious corrosion-resistant disc across the inner surface of said lid member sealingly engaged at the upper edge of said body member, and means on said lid member for dispensing the contents of the container, said means comprising at least one opening through said lid member including a fitting incorporating a removable closure element, said fitting including a portion within said container sealingly engaged to the impervious disc across the inner surface of said lid member, adjacent portions of said fitting and

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disc including removable portions providing access to the contents of the container and maintaining the contents of the container out of contact with the inner surface of said lid member, said fitting including a sieve extending through said lid member, a plug sealingly and removably received in the end of said sleeve disposed opposite said disc, the other end of said sleeve comprising the adjacent portion of said fitting sealingly secured to said disc, said disc comprising of severable material, the portion of said disc disposed beneath the sleeve comprising a severable barrier removable when the plug is removed to obtain access to the interior of the container.

6. In a container as set forth in claim 5 in which said disc is disposed across the upper end of said body member and defines the upper limits thereof for insuring substantially complete dispensing of the contents of said container.

7. A cover assembly for closing a container filled with a corrosive material, said cover assembly comprising a lid member of a composition subject to corrosion by the material in the container or which will contaminate the contents of the container, said lid member having an inner surface, at least one dispensing fitting carried by said lid, said dispensing fitting being formed of a corrosion-resistant material and including a sleeve and a plug fitting in said sleeve in sealed relation, said sleeve passing through said lid member and being sealed thereto, and an impervious corrosion-resistant disc extending across the underside of said lid member and forming a seal with the periphery thereof, said disc also extending below said sleeve and being sealed to the bottom edge said sleeve, whereby the contents of a container are permanently excluded from contact with the underside of said lid member and initially excluded from contact with said dispensing fitting.

8. A cover assembly for closing a container filled with a corrosive material, said cover assembly comprising a lid member of a composition subject to corrosion by the material in the container or which will contaminate the contents of the container, said lid member having an inner surface, at least one dispensing fitting carried by said lid, said dispensing fitting being formed of a corro-

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sion-resistant material and including a sleeve and a plug fitting in said sleeve in sealed relation, said sleeve passing through said lid member and being sealed thereto, and an impervious corrosion-resistant disc extending across the underside of said lid member and forming a seal with the periphery thereof, said disc also being sealed to said sleeve, whereby the contents of a container are excluded from contact with the underside of said lid member, said lid member having an inwardly projecting peripheral rib on the underside thereof, said rib lying generally in the plane of the inner end of said sleeve, whereby said disc may be readily sealed to said sleeve after being positioned on said lid member.

9. A cover assembly for closing a container filled with a corrosive material, said cover assembly comprising a lid member of a composition subject to corrosion by the material in the container or which will contaminate the contents of the container, said lid member having an inner surface, at least one dispensing fitting carried by said lid, said dispensing fitting being formed of a corrosion-resistant material and including a sleeve and a plug fitting in said sleeve in sealed relation, said sleeve passing through said lid member and being sealed thereto, and an impervious corrosion-resistant disc extending across the underside of said lid member and forming a seal with the periphery thereof, said disc also being sealed to said sleeve, whereby the contents of a container are excluded from contact with the underside of said lid member, the inner end of said sleeve being provided with a removable integral plug portion and the connection between said sleeve and said disc is around and inwardly of said plug portion.

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