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BUNG STRUCTURE

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FIG. 1

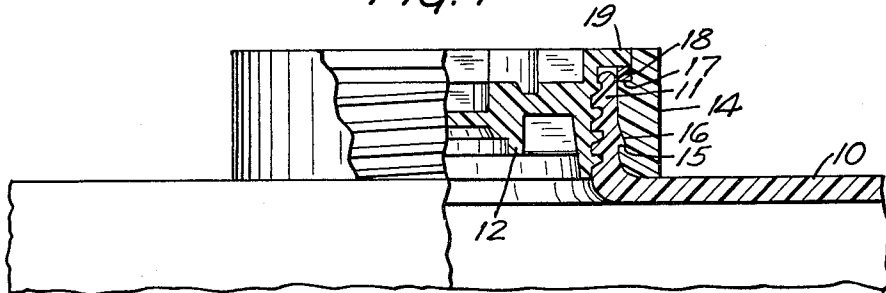


FIG. 2

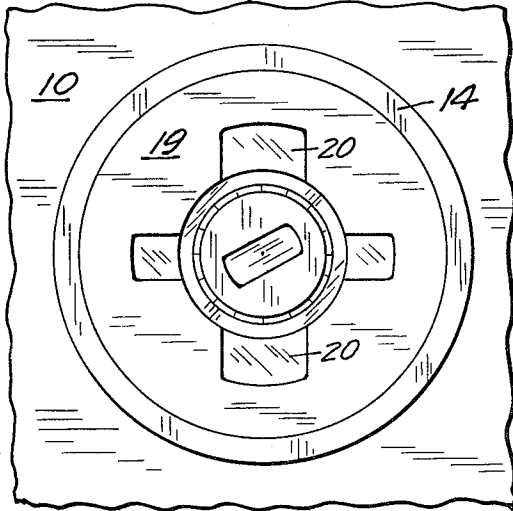


FIG. 3

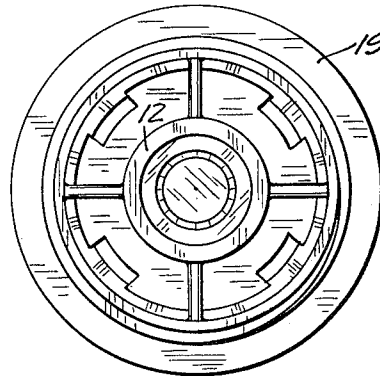


FIG. 4

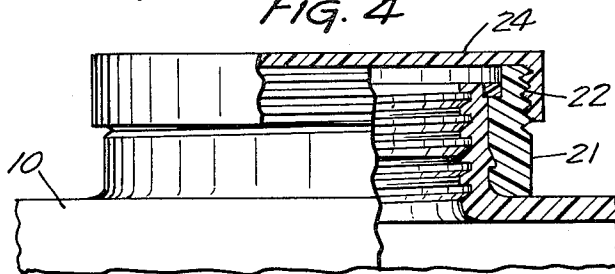
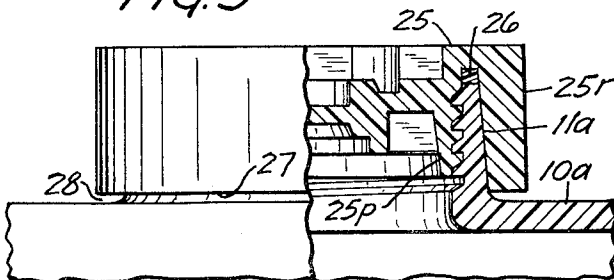


FIG. 5



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## BUNG STRUCTURE

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9 Claims. (Cl. 220-39)

This invention is a molded bung structure for a molded container. It is novel in that the threads of the bung are molded integrally with the principal portion of the container and then the bung is reinforced by a ring secured around the exterior of it which provides sufficient strength to prevent distortion while yet leaving the fundamental formation of the bung threads, etc., of such a nature that they can be molded integrally with the rest of the container.

The problem which this invention was conceived and reduced to practice to solve was that of making liners for steel and fiber drums in which materials that otherwise could not be shipped in these containers may be shipped and stored. Heretofore attempts to manufacture the liners appeared to be hung on the horns of a dilemma. It was not possible to mold the neck or bung of the liner integrally with the main portion and provide it with sufficient strength to prevent its distortion in rough handling. On the other hand, when the bung was made separately so as to provide it with sufficient strength, the liners usually failed at the point of joinder between the bung and the tank liner proper. Obviously the same problem would be present in making a self-supporting molded container of large size.

Accordingly the principal object of this invention is to provide a novel bung structure.

It is a further object of this invention to provide a bung structure in which the bung and container proper may be molded integrally and necessary reinforcing for the bung supplied by a ring applied thereafter.

It is a further object of this invention to provide an integrally molded contained and bung which is strong enough and the bung of which is distortion free enough to meet the tests applied for approval for interstate transportation.

It is a further object of this invention to provide a novel bung structure in which the bung is molded integrally with the container proper and the reinforcing element is a part of the bung plug.

To the accomplishment of the foregoing and related ends, this invention then comprises the features hereinafter fully described and particularly pointed out in the claims, the following description setting forth in detail certain illustrative embodiments of the invention, these being indicative, however, of but a few of the various ways in which the principles of the invention may be employed.

The invention will be described with reference to the drawings in which corresponding numerals refer to the same parts and in which:

FIGURE 1 illustrates the bung and a portion of the container shown partially in side elevation, partially with fragments of the wall broken away to illustrate internal construction and still other portions shown in section with a portion of the stopper or cap shown in place to illustrate how these elements interact with each other;

FIGURE 2 is a plan view of the bung structure, plug and a fragment of the container;

FIGURE 3 is a bottom plan view of the plug;

FIGURE 4 is a view similar to FIGURE 1 except showing a modified form of the structure incorporating

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a dust cap surrounding the exterior reinforcing ring thereof; and

FIGURE 5 is a view similar to FIGURE 1 showing a modified form of the invention.

The device will be described in terms of a tank liner. Since the same structure would be equally advantageous as a free standing container, however, the word "liner" should be understood as referring to and example of use only and not limiting the claimed invention to a liner.

Referring to the drawings and specifically to FIGURE 1 the liner body proper is shown in section at 10 joining and in fact integral with the bung structure 11. This bung has threads formed internally thereof as clearly shown, and a suitable plug 12 may be adapted to threadably engage and fit within the bung opening to close it when desired. Plug 12 should be at least flush with bung 11 when tightly secured.

Around the exterior of the bung is the ring 14 which is made separately from but interlocked with the bung by having an annular groove 15 therein which matches a barbed annular ring 16 molded onto the neck of the bung 11. Once the liner 10 complete with its bung has been molded, the ring 14 may be pressed down around the outside of the bung opening 11 until such time as the annular groove 15 and the barbed ring 16 lock together. Thereafter the ring becomes an inseparable part of the liner.

The ring 14 is provided with an annular internal shoulder at 17 on which a seal as shown at 18 is placed, trapped and engaged by the outer flange 19 of the bung plug 12. Nevertheless, bung plug 12 fits flush with the top of ring 14 or may even extend below the top edge of the ring slightly when it is fully tightened.

With ring 14 embracing the outside of the integrally molded bung 11, it is completely stabilized against expanding. At the same time bung plug 12 tightly screwed into the interior of the unit resists any tendency of the bung to collapse. As a result, a very strong and liquid tight seal may be achieved.

In the plan view of FIGURE 2, the ring 14 is clearly shown extending around the outside of bung 11 and flange 19 of plug 12. The latter is provided with the usual configuration for being engaged by a tightening device such as depressions 20 being formed in the bung plug.

FIGURE 3 shows the structure from the bottom side and illustrates relief of the underside of the plug 12 for reducing weight yet retaining adequate strength.

In FIGURE 4 a slightly modified form of the structure is shown in which the ring here indicated as 21 because of the modified form includes threads 22 formed in the exterior thereof. Otherwise the structure is identical with that described in relation to FIGURES 1, 2 and 3. These external threads are merely for the purpose of receiving a dust cover or cap 24 which screws on the outside of the ring to aid in keeping the bung plug free from dirt. This is a particularly useful structure when the material being transported in a tank is one that is desired to keep as nearly free from contamination by dust particles and the like, as possible. This modified form has no greater structural strength than the form shown in FIGURES 1, 2 and 3.

FIGURE 5 is a modified form of the arrangement described and shown in FIGURES 1-4. This modified form of the invention shows a liner or container 10a which is identical to the container 10 in FIGURES 1-4 except that the bung 11a with its internal threads tapers outwardly slightly and lacks the barbed ring 16. The bung plug and ring are molded integrally as the cap structure 25. Portion 25r of combination plug and reinforcing ring 25 has an internal taper comparable to the

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external taper of bung 11a. As the plug portion 25p is screwed down into bung 11a the ring portion 25r clamps around the outside. If desired a seal as shown at 26 may be provided which becomes comparable to seal 17 in FIGURE 1. In this case it is desirable to have the combination plug and reinforcing ring bottom against seal 26 or against tapering sides of bung 11a before the lower edge 27 engages the top of liner 10a. This provides a clearance as shown at 28 at the left hand side of the drawings in FIGURES 5, which assures that a tight contact has been made internally rather than having the lower edge of the ring 25r bottom rolled against the top 10a of the tank liner.

It is apparent that many modifications and variations of the invention as hereinbefore set forth may be made without departing from the spirit and scope thereof. The specific embodiments described are given by way of example only and the invention is limited only by the terms of the appended claims.

What is claimed is:

1. A container comprising a molded body portion, a bung neck molded integrally with the body portion and extending therefrom, a plug member having an external threaded portion, said bung neck provided with an internal threaded portion for receiving said plug member, said plug member being received within said bung neck, said bung neck further being provided with a barbed flange molded on an exterior portion of the neck, a ring having an annular groove adapted to receive the barbed flange when said ring is in circumjacent relation to said bung neck so that said ring will be substantially unreleasably held in position by said barbed flange, said ring being so received in said circumjacent relation or said bung neck.

2. The container of claim 1 wherein said ring has an axial length at least as long as the axial length of said bung neck.

3. The container of claim 2 wherein said ring presents a wall which is substantially thicker in cross-section than the wall of said bung neck.

4. The container of claim 3 wherein said barbed flange extends circumferentially around said bung neck.

5. The container of claim 4 wherein an O-ring seal is supported by said bung neck and said ring and positively positioned by said plug for sealing the interior of said molded container.

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6. The container of claim 5 wherein said ring presents an external threaded portion, a cap having an internal threaded portion, said cap being threadedly received on said ring.

7. A container comprising a molded body portion, a bung neck molded integrally with the body portion and extending therefrom, said bung neck having a length of its internal surface threaded for cooperation with a threaded plug, the external surface of said bung neck being inclined to the axis of the body with said incline directed outwardly from the open end of the neck to the body portion, a one-piece sealing unit, said unit defined by a plug portion and a ring portion, said plug portion having external threads thereon, said ring portion presenting a tapered inner surface with said taper substantially paralleling the incline of said bung neck, said ring portion further being a length at least as long as the bung neck, said sealing unit being received on said bung neck so that said threaded portions cooperate upon the downward travel of said plug portion and the tapered surface of said ring portion applies a radially inwardly directed force on the bung neck so the latter tends to compress around the plug portion to provide a first seal.

8. The container of claim 7 wherein said ring portion presents a wall which is substantially thicker in cross-section than the wall of said bung neck for reinforcing the bung neck.

9. The container of claim 8 wherein said bung neck supports an O-ring which is positively positioned by the sealing unit when in the received position for providing a second sealing means.

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