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CONTAINER CLOSURE

Filed Feb. 12, 1965

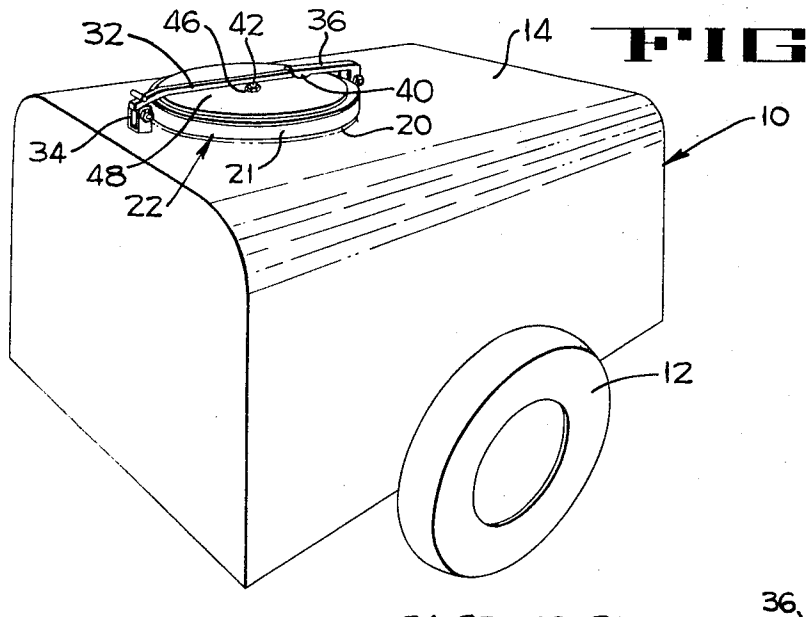


FIG_1

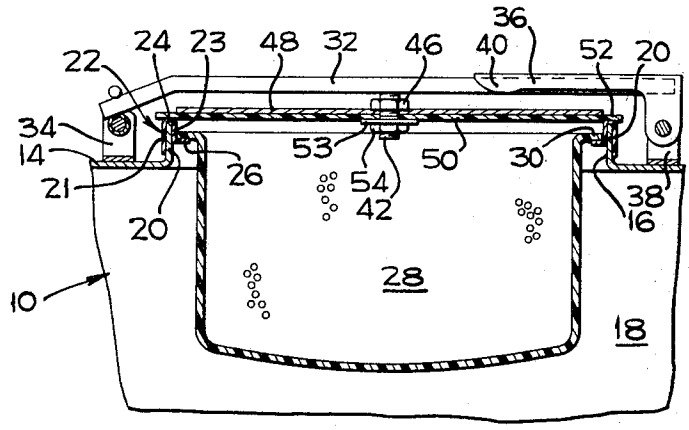


FIG_3

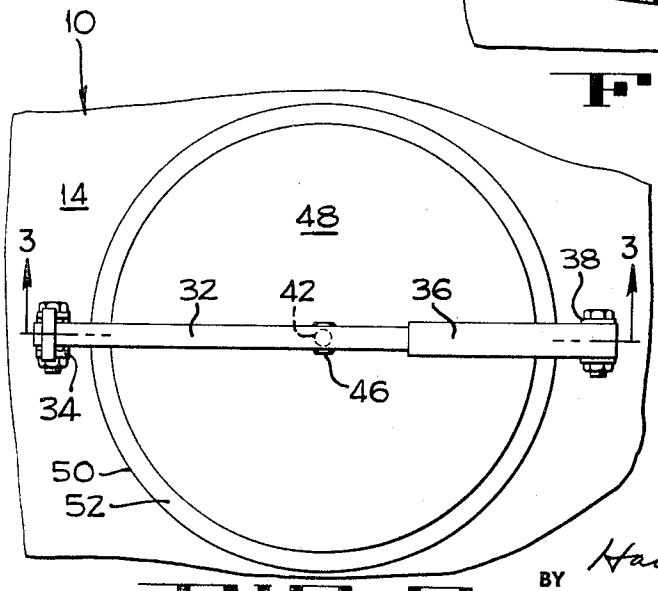


FIG_2

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CONTAINER CLOSURE

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The present invention concerns an apparatus for covering a container opening and more particularly concerns a lid for closing off and sealing a flanged opening of a container.

Certain types of material-holding containers are provided with relatively wide openings through which material may be easily and rapidly transferred from a bulk storage container into the container. However, after filling of the container, it is necessary to close off and seal the opening in order to prevent entrance of contaminating particles from atmosphere, and to prevent escape of the material in those cases where the container is moved about while filled with material.

In the past, many types of material-holding tanks have been provided with openings at one end of each tank defined by an upstanding flange integral with the tank and circumscribing the opening. Various types of close fitting lids have also been developed which, however, have generally required adherence to very close manufacturing tolerances if they are to function properly. Such lids must cooperate with the flange surrounding the opening. Hence the flange must be formed according to relatively strict dimensional tolerances in order that proper sealing may be effected when the lid is placed in contact with the flange.

It is therefore an object of the present invention to provide an improved means for sealing the opening to a container.

Another object of the present invention is to provide an easily and economically fabricated lid for sealing the opening of a container.

Another object of the present invention is to provide an improved means for quickly sealing and unsealing an opening in a container.

Another object of the present invention is to provide a lid for sealing an opening in a container which lid may be formed and is operative without adherence to strict close manufacturing tolerances.

These and other objects of the present invention along with its advantages will become more apparent from the accompanying description when read in conjunction with the accompanying drawing in which:

FIGURE 1 is a perspective of a typical material holding container utilizing one form of the present invention.

FIGURE 2 is a plan view of the present invention as utilized on the apparatus of FIGURE 1.

FIGURE 3 is a section along the lines 3—3 of FIGURE 2.

There is illustrated in FIGURE 1 a container or tank **10** mounted upon wheels **12**, only one of which is shown, for movement over the surface of the ground by attachment to a tractor (not shown).

The top wall **14** of the metal tank is provided with an opening **16** (FIG. 3) through which material, solid or liquid, may be introduced into the interior **18** of the tank. On the upper exterior surface of the tank top **14** there is provided an upstanding flange **20** circumscribing the opening **16**. As shown, the flange **20** is integral with the top wall **14** of the tank and may be formed by bending a portion of the tank top **14** upward after or during the forming of the opening **16**. Or, a suitable separate sleeve may be attached to the top **14** as by rivets, bolts, welding, or the like, in order to provide the upstanding flange **20**.

A gasket or sealing member **22**, generally U-shaped in cross-section, is disposed over the upper edge of the flange **20**. The gasket is preferably comprised of a relatively tough yet resiliently compressible material, such as, for example, rubber or polyethylene. The spacing between the leg portions **21** and **23** of the gasket in its free unstressed state should be slightly less than the thickness of the flange **20**. In this manner the gasket may be snugly fitted onto the flange and, in this stressed condition, the natural resiliency of the gasket material will hold leg portions **21** and **23** in tight sealing contact with both sides or surfaces of the flange, protecting the flange from rusting and the like.

The sealing gasket **22** runs the entire circumference of the flange **20**. If the opening **16** and flange **20** are circular, as illustrated, the gasket may be initially formed as a continuous circular ring. If the opening and flange **20** are rectangular or other than circular in shape, the gasket may be suitably formed initially to correspond with such shape.

The top or bridging portion **24** of the gasket provides an upwardly facing smooth seal surface which cooperates with the tank lid of the present invention as described in further detail below.

The lower edge of inner leg portion **23** of the circular gasket **22** may be turned radially inward to form a strainer basket-retaining ledge **26**. With this arrangement, a cup-shaped perforated strainer basket **28** having a radially extending retaining flange **30** near its upper edge may be retained in the opening **16** at a level below the level of the top surface of the bridging portion **24** of circular gasket **22**.

A longitudinally extending locking bar **32** is pivotally attached at one end to a support member **34** which is suitably secured to the tank top **14** near one side of the flange **20**. The bar **32**, when in its locking position as illustrated best in FIGURE 3, extends from support member **34**, above and diametrically across the flange **20** and opening **16**, and terminates at a point outwardly of flange **20**.

A latch lever **36** is pivotally attached to a support member **38** secured to top **14** at a point generally below the terminating end of the bar **32**.

When the bar **32** is pivoted to its locking position, as illustrated in FIGURE 3, the lever **36** may be pivoted toward and over the bar **32**. Two friction tabs **40** (one only being shown) engage the bar **32**, one on each side, and thus latch the bar and lid in a horizontal locking or sealing position as shown.

A lid supporting and adjusting stud **42** is rigidly secured to the lower side of bar **32** at a position substantially directly over the center of opening **16** and extends for a short distance downwardly toward the interior **18** of the tank **10**. The stud **42** is provided with threads along substantially its entire length. A lock nut **46** is threaded over the stud **42** to a position near the bar **32**.

A relatively stiff disc shaped, sheet metal reinforcing plate or member **48** having a central opening is disposed over the stud **42** against the nut **46**. The diameter of the plate **48** is less than the distance between diametrically opposite points of the inner legs **23** of the seal gasket **22**.

Directly beneath the reinforcing plate **48** there is provided a disc-shaped seal member **50** having a central opening through which the stud **42** projects.

The radially outer rim **52** of the disc **50** extends outwardly of the radially outer edge of plate **48** and over the bridging portion **24** of gasket **22**. The disc **50** is comprised of a resiliently flexible material such as for example, rubber or polyethelyene. The natural resiliency of the disc may be sufficient to cause the disc to retain its flat shape against the bottom of plate **48** when a retaining washer **53** is fitted over the stud and against the

disc and a nut 54 is threaded over the stud 42 and against the washer to firmly retain the plate and disc in a predetermined position along the axial length of the stud. If desired, adhesive may be introduced between the plate and disc in order to cause the disc to retain a relatively flat shape.

When the locking bar 32 is in its locking position, the lower surface of the rim portion 52 of the disc 50 is brought into contact with the bridging portion 24 of gasket 22. The plate 48 and disc 50 should be positioned along the stud so that the rim 52 is bent or deformed slightly upward when it is in full contact with the gasket 22. The natural resiliency of the material of the disc will thus cause the rim to be maintained in sealing contact with the gasket 22 under a positive but adjustable force. Any irregularities in the surface of the bridging portion 24 will be filled in by the rim 52 and thus the effective closing and sealing of the opening 16 is accomplished.

From the foregoing description, it will be seen that the present invention provides a closure or lid assembly for covering and sealing an opening of a container. The lid assembly is economically fabricated since the design eliminates the need for close manufacturing or assembly tolerances. In addition the lid assembly of the present invention is adjustable to compensate for any wear that may be encountered.

What is new and desired to be secured by Letters Patent is:

1. In a container having an opening provided in a wall thereof; seal engaging means provided on said wall and circumscribing said opening; said seal engaging means including a gasket; lid means mounted on said wall for pivotal movement between a sealing position and an open position; said lid means including resilient seal means arranged to be urged into sealing contact with said gasket when said lid means is pivoted to said sealing position.

2. In a container having an opening provided in a wall thereof; detachable seal engaging means provided on said wall and circumscribing said opening; said seal engaging means including an annular ledge for supportin a strainer basket; hinged lid means mounted on said wall for swinging movement between a first position wherein said lid is disposed directly over said opening and a second position wherein said lid is disposed alongside said opening; resilient sealing means provided on said lid means, said sealing means arranged to contact and be flexed by said seal engaging means when said lid means is in said first position.

3. In a container according to claim 2, releasable means for latching said hinged lid means in said first position.

4. In a container having an opening provided in a wall thereof; seal engaging means provided on said wall and circumscribed said opening; said seal engaging means including a resilient sealing member; lid means mounted on said wall for movement between a first position wherein said lid means is in a predetermined disposition directly over said opening and a second position wherein said lid is disposed away from said opening; flexible resilient seal means disposed on said lid means for flexed engagement with said resilient sealing member when said lid means is in said first position.

5. In a container having an opening provided in a wall thereof; a seal engaging means circumscribing said opening, said engaging means upstanding from said opening and terminating in an edge disposed a predetermined distance from said wall, a lid latching member supported on said wall for movement between a first position wherein said latching member extends over said opening, and a second position wherein said latching member extends away from said opening, a flexible lid means mounted on said latching member and disposed between said opening and said latching member when said latching member is in said first position, and being arranged to contact said seal engaging means when said latching member is in said first position, releasable means for adjusting the mounting of said lid means on said latching means to adjust and control the amount of flexing of said sealing means when said latching means is in said first position.

6. In a container according to claim 5, wherein said lid means includes a flat disc and sealing means, and wherein said sealing means comprises a sheet of material disposed adjacent said disc and between said disc and said opening when said latching means is in said first position.

7. A closure member for closing and sealing an opening provided in a container wall, said member comprising a back up plate of a size smaller than said opening, a sheet of flexible resilient material of a size greater than said opening, said plate and said sheet being held together with said plate being substantially centered with respect to said sheet, and means for mounting said closure member to said container wall.

8. In an apparatus for releasably sealing and closing an opening provided in a container wherein a latching member is mounted for movement between a position extending over said opening and a position alongside said opening; a resilient gasket seated around said opening; a lid having a resilient flexible peripheral sealing edge engageable with said gasket when said lid is disposed directly over said opening, means for mounting said lid on said latching member so that said lid is directly over said opening when said latching member is in said first position, means included on said mounting means for releasably adjusting the distance between said lid and said latching member to adjustably vary the flexing of said rim when said latching member is in said first position.

9. In an apparatus according to claim 8 wherein said lid comprises a flat plate of relatively stiff material and a flexible disc each having a central opening, said plate being positioned adjacent said disc with the central openings thereof in aligned relationship, wherein said mounting means includes a stud attached to said latching member and being disposed generally over the center of said opening in said container when said latching member is in said first position, and wherein said mounting means includes means for securing said plate and said disc together and to said stud.

10. In an apparatus according to claim 9, wherein said releasably adjusting means includes threads provided on said stud, and nuts threadedly disposed over said stud and on both sides of said lid, said nuts being screwed toward each other with a force great enough to secure said lid in a position along the axial length of said stud.

11. The invention defined by claim 1 wherein said wall of said container is bent upwardly around said opening to form a flange and wherein said gasket is an inverted U-shaped member that is snugly fitted over said flange.

12. The invention defined by claim 1 wherein said gasket is provided with an inner supporting means extending at least on opposite sides of said opening.

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