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CLOSURE FOR JARS AND THE LIKE

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Fig. 1.

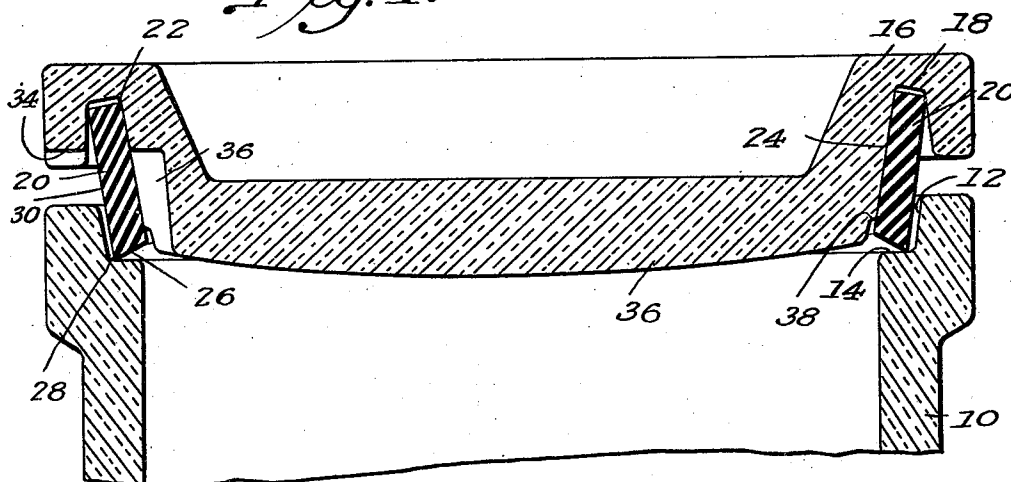
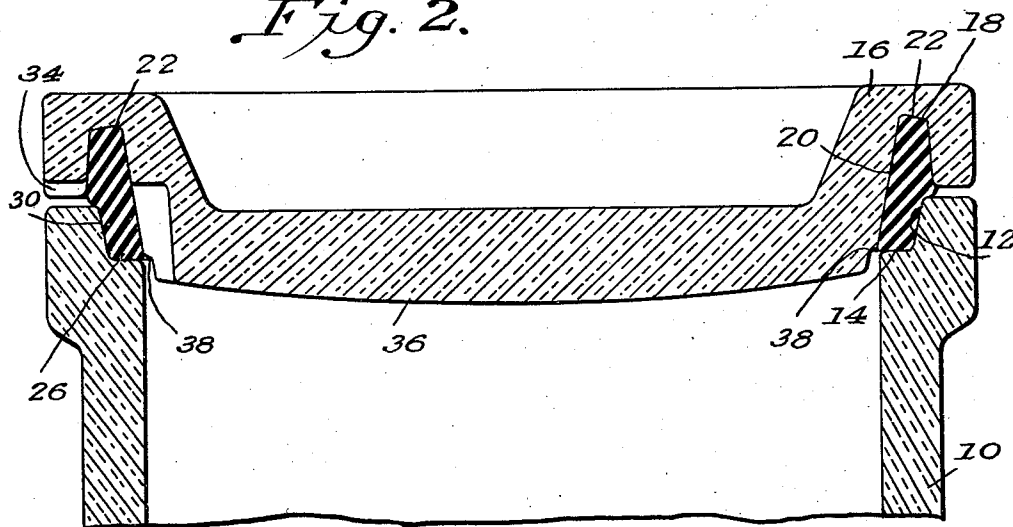


Fig. 2.



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CLOSURE FOR JARS AND THE LIKE

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Application December 23, 1940, Serial No. 371,418

2 Claims. (Cl. 215—40)

This invention relates to so-called self-sealing containers adapted to be maintained in sealed condition solely by atmospheric pressure.

In the construction of containers of this general type, it has been customary to provide a very precise fit between the lid, the sealing gasket, and the container mouth constituting the primary elements of such combinations. Such precise interfitting of parts has been deemed necessary because the sealing effect was brought about by establishing an immediate broad area of sealing contact between a deformable gasket and the container parts through a wedging or compressing force exerted against the gasket. Container seals operating on the foregoing principle have met with indifferent commercial success because of manufacturing limitations which preclude quantity production of containers which fully meet the requirements as to precision. This has been particularly true of containers manufactured of glass or other plastic materials wherein the exact size and shape cannot be controlled within very narrow limits.

In my prior application, Serial No. 306,746, filed November 29, 1939, now Patent No. 2,280,070, dated April 21, 1942, I have disclosed a container which embodies a new principle of operation, effectively eliminating the necessity of providing a precise interfitting of the several parts. The container shown in that application provides a lid for the open mouth of the container and a gasket or sealing member carried by the lid, which sealing member has a leading edge affording a relatively narrow line area for contact with an annular shoulder provided internally of the container near the mouth thereof. That construction eliminates the necessity of precise interfitting and, in fact, is designed to provide a clearance between the outer surface of the sealing member and the adjacent wall of the container. This latter construction is rendered possible by the improved valve-like sealing effect secured by the line contact of the inner end of the sealing member with the container shoulder.

This invention embodies the improved construction of my aforesaid application, and seeks to improve the same by providing a means whereby a greater vacuum may be established within the container with greater ease than has been possible heretofore.

The object of the invention is attained by providing a container lid with a face portion which is adapted to enter the mouth of a container and expel therefrom any air which might otherwise be entrapped therein. The construction is such

that clearance between the outer face of a lid-carried sealing gasket and the inner wall of the container mouth permits the lid face to expel mechanically substantially the entire amount of air which might be present above substance within the container before the sealing gasket becomes deformed into contact with the wall of the container at its mouth. This and other objects of the invention and advantages inherent therein will become apparent as the detailed description is read with reference to the accompanying drawing in which:

Figure 1 is a fragmentary vertical view through a container and lid thereon constructed in accordance with the invention, and showing the position of the several parts prior to the sealing thereof; and

Figure 2 is a view similar to Figure 1, showing the several parts after the sealing thereof.

In the drawing, wherein like reference numerals indicate like parts, is shown a container comprising a body portion 10, which is provided with a mouth having a wall 12 terminating in an annular shoulder 14 which is adapted to seat the inner edge of a sealing member carried by the lid. The lid 16 has an annular groove 18 spaced inwardly from its peripheral edge. The groove 18 is adapted to seat the outer edge of a sealing member. A sealing member 20 has its outer edge 22 seated in the groove 18. The proportions of the sealing member 20 are such as to provide a snug fit between the outer faces thereof and the side walls of the lid which define the groove 18.

The lid 16 is provided with a backing wall 24 which depends from the body of the lid, and the outer wall of which may define the inner wall of the groove 18. The backing wall or member 24 is adapted to afford support to the sealing member 20 throughout a major portion of its area.

The inner edge 26 of the sealing member 20 is provided with a leading portion 28 which normally extends beyond the body of the sealing member so as to adapt said leading portion to contact the annular shoulder 14 prior to contact of the outer side 30 thereof with the wall 12 at the mouth of the receptacle during sealing operations.

The position and width of the groove 18 in the lid 16 are so arranged with respect to the walls at the mouth of the container to provide a slight clearance between the outer face 30 of the sealing member 20 and the wall 12 defining the mouth of the container.

The construction, as described, permits effective sealing of a container upon at least partial evacuation of its interior after the lid has been applied to the mouth of the container. In Figure 1 of the drawing is shown the manner in which the lid 16, the sealing member 20, and the walls 12 and 14 at the mouth of the container 10 cooperate upon placement of the lid upon the mouth of the container prior to a sealing operation, which operation may consist in the partial evacuation of air from the container.

By reference to Figure 1 of the drawing it will be seen that the leading portion 28 at the inner edge 26 of the sealing member is in contact with the annular shoulder 14 in such manner as to provide a relatively narrow line contact around the entire circumference of the annular shoulder 14. At the same time it will be noted that a small annular space remains between the outer face 30 of the sealing member 20 and the mouth defining wall 12 of the container.

Upon contact of the leading portion 28 with the annular shoulder 14 an immediate seal is provided between the cover 16 and the container 10. This relatively narrow line annular seal functions effectively as a valve during the egress of air, vapors, or liquids, from within the container. The ebullition of hot substances within the container or substances heated in the container will be effective to lift the lid 16 sufficiently to permit escape of air and vapors from within the container. Upon the escape of such air, vapors and liquid, and upon the release of internal pressure, the lid 16 will return immediately and under its own weight to a position wherein the leading portion 28 of the edge 26 again contacts throughout the circumference of the annular shoulder 14 to form an effective seal.

The free movement during the placement of the lid 16 upon the mouth of the container 10 and during the escape of air, vapor or liquid from the interior of the container 10 is permitted by the clearance between the outer face 30 of the sealing member 20 and the wall defining the mouth of the container. This clearance insures, among other things, that the sealing member 20 and particularly the leading portion 28 of the edge thereof is seated against the shoulder 14 at all times. The clearance eliminates all possibility of improper fitting of the cover 16 on the mouth of the container.

In Figure 2 of the drawing is shown the position of the lid 16 with respect to the mouth of the container and the shape and position of the sealing member 20 with respect to the container and lid walls adjacent thereto after the container has been at least partially evacuated and atmospheric pressure has become effective to hold the lid 16 so tightly on the mouth of the container 10 as to deform the elastic sealing member 20 against the aforesaid members of the lid and container to provide an effective seal. The seal thus affixed is maintained until the same has been deliberately broken and atmospheric pressure has been admitted to the container.

In order to release the lid 16 after the same has once been firmly seated upon the mouth of the container 10, there has been provided a passageway extending through the zone occupied by the sealing member 20, such passageway being adapted to receive and guide a piercing tool effective to permit ingress of atmosphere.

In the drawing is shown a recess 34, which is formed in the underside of the peripheral flange of the lid 16. This passageway 34 is located at

a point below the bottom of the groove 18 and in alignment with a passage 36 formed in the depending wall 24. The passage 36 opens downwardly into the container 10 when the lid is applied thereto for the purpose of permitting the free flow of external atmosphere through the passage 34 and into the container when the sealing member 20 has been pierced by any suitable piercing instrument.

In my prior construction I have embodied successful and commercial features but I have found that occasionally a slight amount of air has been entrapped between the lid and the top of the substance being packed in the container.

In order to mechanically and effectively expel all of the air which might otherwise be entrapped under the lid after same has been applied so as to prevent possible contamination of the contents of the container and for the further purpose of permitting a greater and more effective vacuum to be induced within the jar, there is provided a face portion 36 on the lid 16 which is adapted to enter the mouth of the jar prior to such contact of the sealing member 20 with the annular wall 14 as to deform the sealing member. The face portion 36 may lie in a substantially horizontal plane and may be contiguous with the depending member 24 of the lid, and the same may be formed on a convex line such as shown in the drawing. In order to eliminate any possibility of a portion of the face 36 or of the depending wall 24 coming in contact with the annular shoulder 14, the face 36 has been joined to the depending member 24 by means of an annular offset 38. The offset 38 permits the face 36 of the lid to pass freely within the diameter of the annular shoulder 14 and thereby precludes such contact between these points which might otherwise prevent the face 36 from entering the mouth of the jar to a depth effective to expel atmosphere or excess amount of liquid or vapors found therein.

It is to be noted that the construction is such that the face 36 lies in substantially the horizontal plane of the annular shoulder 14, and in most cases portions thereof lie below this plane upon the placement of the lid on the container mouth, and before the deformable sealing gasket 20 has been compressed to an extent which would bring the outer wall 30 thereof into contact with the wall 12 at the mouth of the container. This relationship of parts permits the valve-like action of the gasket 20 to remain operative to allow egress of superfluous air, vapor or liquid in the mouth of the container.

Having now described the invention, it is manifest that the practise thereof shall include obvious modifications and that no limitation shall be put thereon other than those that may be imposed in the following claims.

I claim:

1. The combination of a container including a body having a mouth provided with a wall terminating in an annular shoulder internally of said container, a lid for said container having means adapted to seat the edge of a sealing member, a sealing member having its outer edge seated by said means and having an inner edge adapted to contact said annular shoulder, said sealing member having a smaller normal outer diameter than the diameter of the wall at said mouth whereby the inner edge of said sealing member is adapted to contact said annular shoulder prior to contact of the outside thereof with the wall at said mouth, a sealing member sup-

port depending from said lid to a point adjacent the inner edge of said sealing member, and a face portion at the inner extremity of said supporting member extending below the inner edge of said sealing member, said face having a minimum diameter substantially as great as the container at said annular shoulder and having a depth sufficiently great to permit the positioning of said face at least in the horizontal plane of said annular shoulder upon contact of the inner edge of said sealing member with said shoulder and prior to deformation of said sealing member and being adapted to lie in a substantially horizontal plane slightly below the plane of said shoulder when said lid is in container sealing position.

2. The combination of a container including a body having a mouth provided with a wall terminating in an annular shoulder internally of said container, a lid for said container having means adapted to seat the edge of a sealing member, a sealing member having its outer edge seated by said means and having an inner edge adapted to contact said annular shoulder, said

sealing member having a smaller normal outer diameter than the diameter of the wall at said mouth whereby the inner edge of said sealing member is adapted to contact said annular shoulder prior to contact of the outside thereof with the wall at said mouth, a sealing member support depending from said lid to a point adjacent the inner edge of said sealing member, and an inwardly offset face portion of convex shape at the inner extremity of said supporting member extending below the inner edge of said sealing member, said face having a minimum diameter substantially as great as the container at said annular shoulder and having a depth sufficiently great to permit the positioning of said face at least in the horizontal plane of said annular shoulder upon contact of the inner edge of said sealing member with said shoulder and prior to deformation of said sealing member and being adapted to lie in a substantially horizontal plane slightly below the plane of said shoulder when said lid is in container sealing position.

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