

Feb. 20, 1968

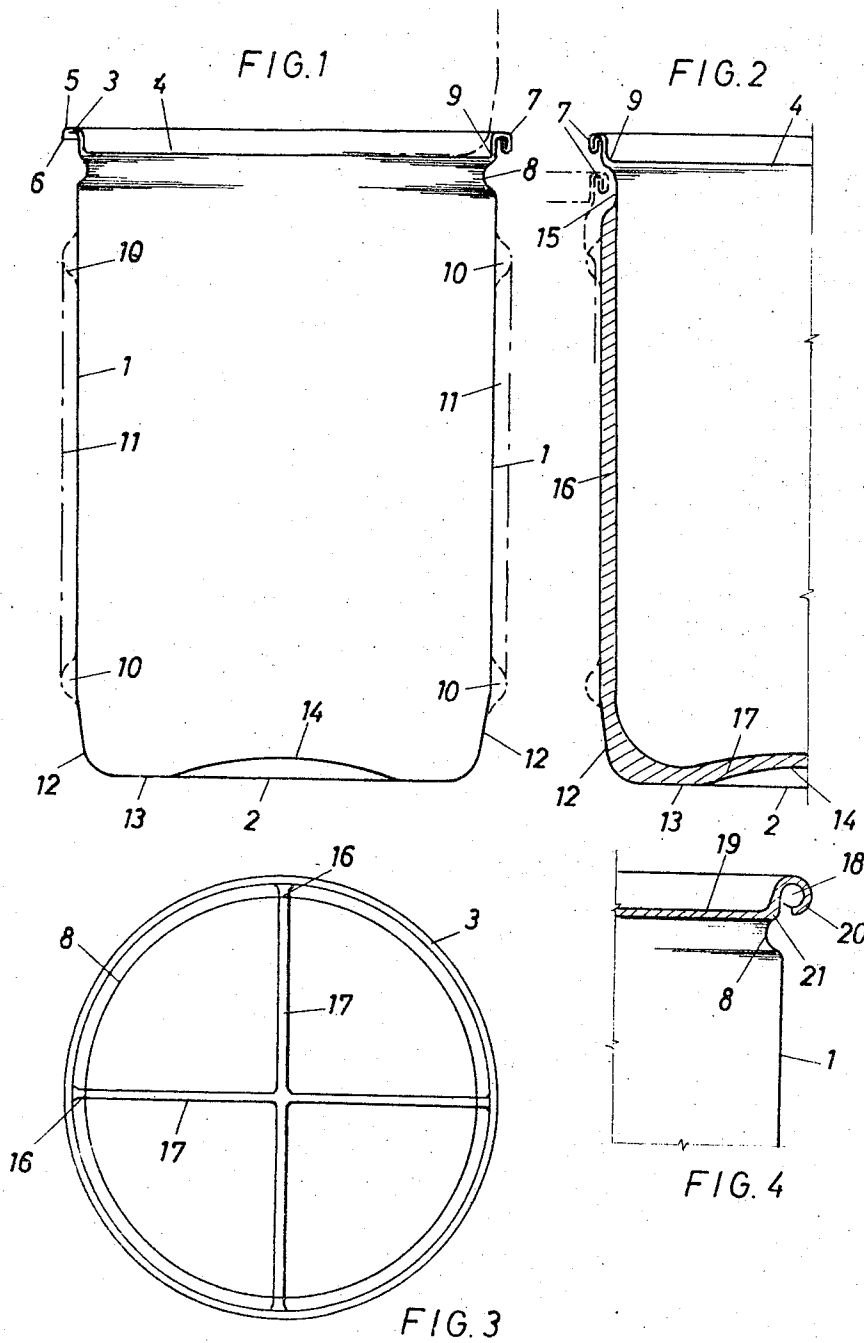
A. MAUSER ETAL

3,369,694

CONTAINER WITH LID CLOSURE

Original Filed April 18, 1963

2 Sheets-Sheet 1



Feb. 20, 1968

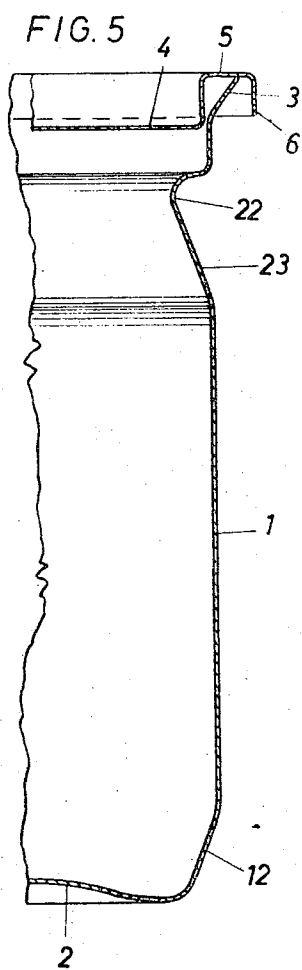
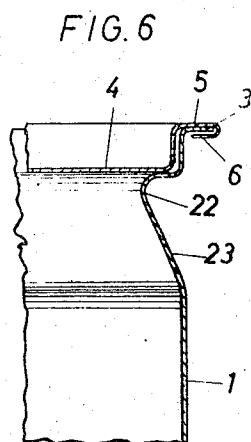
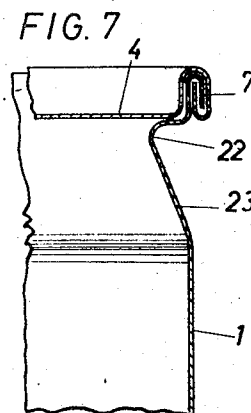
A. MAUSER ET AL

3,369,694

CONTAINER WITH LID CLOSURE

Original Filed April 18, 1963

2 Sheets-Sheet 2



1

3,369,694

CONTAINER WITH LID CLOSURE

Alfons Mauser, Goltsteinstr. 230, Cologne-Bayenthal, and Friedrich Muhlhoff, Arnimstr. 105, Cologne-Bickendorf, Germany

Continuation of application Ser. No. 273,977, Apr. 18, 1963. This application Aug. 5, 1966, Ser. No. 570,672

Claims priority, application Germany, June 8, 1962, M 53,162; Sept. 13, 1962, M 54,221

10 Claims. (Cl. 220—67)

This application is a continuation of application Ser. No. 273,977, filed April 18, 1963, now abandoned.

The invention relates to a container provided with a lid type closure means, preferably to thermoplastic synthetic material, and more particularly to a stackable, small container for oil or other liquid contents in which the body and bottom of the container are made in one piece.

For reasons of minimizing the transportation costs, such containers are made with thin walls and are provided with suitable reinforcements, in order, on the one hand, to protect the containers adequately against mechanical influences and, on the other hand, to assure that the containers retain their shape. This applies particularly to the rim or margin of the filler opening, which must be made to hold its shape securely, so that a mechanical application of the lid closure means is assured during the mechanical filling and closing of the container. In contrast to containers of the type in which the filler opening occupies but a portion of the cross-section of the container, considerable difficulties arise in the case of containers having a filler opening or openings which corresponds substantially to the total cross-section of the container. In such situations, to make the rim or margin of the opening retain its shape, a thickening or enlarging of the rim is provided which, however, if it is to be completely effective, requires a considerable expenditure of material, and also from the standpoint of costs, is undesirable in the processing, due to the necessity of special tools, more working time, et cetera.

Containers are also known in which the container wall is provided with outwardly projecting reinforcing ribs for imparting to the container a suitable rigidity as regards its configuration such as, for example, against transverse strains. It has been found, however, that an outwardly projecting rib in the zone of the rim of the filler opening is not sufficient to assure the necessary calibration of the opening. Moreover, in machine beading in the case of the use of sheet metal, as well as in the blowing in case of the use of a preformed shape of synthetic material, the container wall is stretched considerably, and thus is frequently weakened beyond admissible degree. Hence, it happens in case of impact stress, that leaks develop quite easily at the weakened areas and, in case of axial strain, deformations occur by reason of folds in the weakened rib zones. The weakening because of exterior beading is especially disadvantageous in the case of a container being dropped, when either the fold connection becomes loosened or the wall tears below the rib.

The disadvantages mentioned above are avoided in the container constructed according to the present invention, in that, initially there is provided in the zone of the filler opening rim or margin, directly below the lid fold or the lid bottom, a suitably designed reinforcing rib which projects into the interior of the container body. This arrangement results in numerous advantages.

More particularly, there is no weakening of the container wall during the mechanical beading in the direction of the interior of the container, nor in the blowing of the container wall from a preformed shape. Rather, because of the upsetting of the material, the wall thickness

2

will increase in the depth of the rib, thereby effecting an increased stability of the rim of the container. This effect is adequate for assuring that the opening rim of the container will maintain such shape which will guarantee the mechanical placement of the lid or closure means and the unobjectionable closing by means of folding or crimping.

It has been demonstrated that, when the beaded edge is affected by the dropping of a container, the inwardly directed rib is fully adequate, in case of a filled container, to secure the beaded connection against loosening and prevent a tearing or rupturing of the container wall below the bead connection and thereby prevent leaking of the container. In case of axial strain, the rib disposed according to the invention effects an elastic deflecting movement without harmful effect upon the container wall, per se.

The inwardly directed rib of the wall, made and suitably disposed according to the invention, also provides a great annular stiffening in connection with the rim of the lid and the beaded connection, and thus such a high moment of resistance that deformations of the container cannot arise upon the occurrence of transverse strain.

In general, the wall of the container is made yielding, without stiffening, as the flexible nature of the material in any event does not permit permanent deformation from lateral pressure loads. However, it is an object of the present invention to provide, in addition to the inwardly directed rib in the zone of the rim or margin, also so-called rolled beads in the wall, which at the same time function to stiffen further the container wall and exterior, longitudinal beads or ribs disposed between the rolled beads can provide a further substantial stiffening effect.

According to the invention, the container wall is provided with a reduced outside diameter adjacent its bottom, which is preferably obtained by a gradual transition. Thus, there is obtained, without the use of special stacking means, the stability of the upright container in the cup-shaped recess formed in the lid of the container located therebelow. In order to assure the secure placement of the stacked container through a flat formation of the supported bottom part, the bottom is provided with an inwardly directed arched area in its middle portion.

One embodiment of the present invention relates to a widening of the inwardly directed rib, whereby in the case of possibly obliquely adjoining containers in the stacking assembly, there is provided a direct impact of the rim bead of this container upon the wall transition so that damaging or rupturing is avoided.

In a further embodiment of the invention, there can be disposed adjoining the inwardly directed rib, interior longitudinal ribs or beads which, preferably will also extend across the bottom and thereby impart to the wall and the bottom a special stability.

The construction of the container wall according to the invention also makes possible, apart from the lid locking by means of a rolled bead connection, the use of self-sealing push-on lids of synthetic material. In such situation, the rim of the container wall is preferably provided with a rolled bulge or bead which can be made directly after the blowing by making use of the forming heat. The self-sealing, cup-shaped lid enclosing the rim of the container will also at the same time rest in a sealing fashion on the inwardly directed rib.

It has been found that the reinforcing rib located in the zone of the opening rim directly below the rolled bead of the lid or the lid bottom and projecting inwardly has a particularly advantageous effect if a transition into the container wall starting from the deepest point of the rib and directed toward the bottom, in the shape of a truncated cone, is provided. This arrangement imparts to the container wall a substantially improved stability.

3

Uniform wall thicknesses are obtained during production, if the container wall is made by means of the blowing method. The uniformity of the wall thickness of the container wall continues also in the upper rolled bead rim if, according to the invention, the rim is made so that it extends upwardly at an obtuse angle with respect to the horizontal, and preferably, the rim of the container wall is provided with an inclination of from 60 to 80°. There will be no weakening of the bead edge through, e.g., drawing out into the horizontal during the condition of the material in the deforming heat.

The obliquely shaped bead rim has the further advantage of resulting in a secure seating for the closure lid, especially when the containers are closed by machines. By means of the greater play between the bead edge of the lid and the bead rim of the container, cramping due to improper positioning of the lid is avoided, which might result in unreliable closures and in work interruptions.

The present container can be made by the simplest means, so that the manufacturing costs remain low, and conditions for an excellent retention of shape and for safety against damaging influences are realized to a high degree.

Further objects and advantages of the invention will become more readily apparent from the following detailed description and attached drawings, and in which drawings:

FIG. 1 is an elevational view of the container, showing on the left side a loosely positioned lid prior to the folding over operation, and on the right side a completely folded lid;

FIG. 2 is a cross-section through another embodiment of a container provided with a wider inwardly directed rib and inner reinforcing;

FIG. 3 is a top plan view of the container without a lid;

FIG. 4 is a fragmentary cross-section through the rim of the opening of a further embodiment of the container;

FIG. 5 is a fragmentary cross-section through the container prior to the folding over of the rims;

FIG. 6 is a fragmentary cross-section through the upper portion of a container after a partial performance of the fold-over step, and,

FIG. 7 is a view similar to FIG. 6, and illustrating a completely folded-over lid.

Container side wall 1 and bottom wall 2 are made in one piece from thermoplastic synthetic material. The upper end of the container wall 1 is formed by rim 3, on which rests a loosely placed, cup-shaped lid or closure 4 with its outer rim 5 being provided with a folded portion 6, (left side of FIG. 1). The rim 3 and the lid from 5 and portion 6 serves to define the folded connection 7, which is shown at the right side of FIG. 1. Below the folded connection 7 and the bottom of the lid 4, the wall 1 is formed with an inwardly directed rib 8, and preferably the rib 8 abuts lower edge 9 of the bottom of the lid 4.

Horizontal ribs 10 and longitudinal ribs 11 for the wall 1 are shown in dot-dash lines. The wall 1 is provided with inwardly directed portion 12 at the bottom which merges with a flat support surface 13, and the middle of the bottom wall 2 is formed with an inwardly directed recess or domed portion 14.

In the embodiment shown in FIG. 2, a widened rib 15 is provided so that the fold connection 7 of the adjacent container can be received thereby. In this form, inwardly directed longitudinal ribs 16 extend upwardly to the rib 15 and continue via ribs 17 on support surface 13 and recess 14.

In FIG. 4, the container wall 1 terminates at the upper end in a rolled bulge or lip 18 which, if desired, can be provided with a reinforcing insert. A self-sealing lid 19 of synthetic material serves as a closure, and its outer rim 20 sealingly engages the bulge 18 while its lower edge 21 abuts against the rib 8 in a form-locking manner.

An especially advantageous container is shown in FIGS.

4

5-7. The container which is of synthetic material, consists of a side wall 1 and a bottom wall 2 preferably made in one piece. Below the bottom of the lid 4 where is provided an inwardly directed reinforcing rib 22 and the rim 3 is directed obliquely upward. The gradual transition from the deepest portion of the rib 22 to the side wall 1 is made via a truncated cone portion 23. The inclination of the surface of the truncated cone portion 23 corresponds approximately to the inwardly directed bottom portion 12. With the loosely placed lid 4, which supports itself with its outer rim 5 on the rim 3 of the container, there exists between the portion 6 of the lid and the rim 3 of the container wall an ample play for assuring an unimpeded, mechanical placement of the lid.

A light pressure of the securing tool is sufficient for folding over the container rim 3 and the portion 6, as shown in FIG. 6, and the completed fold connection 7 between the container wall 1 and lid 4 can be seen in FIG. 7.

The disposition of the rib 22 with the truncated cone portion 23 directly below the bottom of the lid 4 provides for a reliable maintenance of shape and firmness of the rim for the safe effecting of the fold connection 7.

The invention is not to be confined to any strict conformity to the showings in the drawings, but changes or modifications may be made herein, so long as such changes or modifications do not depart from the spirit and scope of the appended claims.

We claim:

1. A stackable container, comprising a body defined by a bottom wall and a side wall, said side wall terminating in an outwardly obliquely directed rim defining an opening for the container and said side wall being provided with an inwardly directed rib located below said rim; and a sheet-material lid for closing the opening, said lid having a bottom, an annular wall, a rim along the upper end of said annular wall, and a portion extending downwardly from said rim substantially perpendicularly thereto, said rim of said lid being adapted to rest upon said rim of the side wall with said downwardly extending portion located exteriorly of said rim of the side wall, and the height of the side wall from said reinforcing rib to the beginning of said outwardly obliquely directed rim being approximately equal to the height of said annular wall of the lid so that, when said rim of the lid, said rim of the side wall and the downwardly extending portion are folded to secure the lid to the container body, the bottom of the lid abuts the reinforcing rib.

2. A stackable container, comprising a body defined by a bottom wall and a side wall, said side wall terminating in a rim defining an opening for the container and said side wall being provided with an inwardly directed rib located below said rim; and a sheet-material lid for closing the opening, said lid having a bottom, an annular wall, a rim along the upper end of said annular wall, and a portion extending downwardly from said rim substantially perpendicularly thereto, said rim of said lid being adapted to rest upon said rim of the side wall with said downwardly extending portion located exteriorly of said rim of the side wall, and the height of the side wall from said reinforcing rib to the beginning of said rim of said side wall being approximately equal to the height of said annular wall of the lid so that, when said rim of the lid, said rim of the side wall and the downwardly extending portion are folded to secure the lid to the container body, the bottom of the lid abuts the reinforcing rib.

3. A stackable container comprising a one-piece body having a bottom wall, a side wall, a rim at the open end of said side wall and an inwardly directed rib located below said rim; and a sheet-material lid for closing the open end, said lid having a bottom wall, an annular wall and a rim along the upper end of said annular wall, said rim of said lid having a width at least equal to the height of said annular wall and being adapted to rest upon said rim of said side wall, and the height of the side wall por-

5

tion from the reinforcing rib to the beginning of said rim of said side wall being approximately equal to the height of said annular wall of the lid so that, when said rim of said lid and said rim of said side wall are superimposed and folded in direction toward said side wall portion to secure the lid to the container body, the bottom of the lid abuts said reinforcing rib of said body.

4. A stackable container comprising a one-piece body having a bottom wall, a side wall, an outwardly obliquely directed rim at the open end of said side wall and an inwardly directed rib located below said rim; and a sheet-material lid for closing the open end, said lid having a bottom wall, an annular wall and a rim along the upper end of said annular wall, said rim of said lid being adapted to rest upon said rim of said side wall and the height of the side wall portion from the reinforcing rib to the beginning of said outwardly obliquely directed rim being approximately equal to the height of said annular wall of the lid so that, when said rim of said lid and said rim of said side wall are superimposed and folded in direction toward said side wall portion to secure the lid to the container body, the bottom of the lid abuts said reinforcing rib of said body.

5. A container as defined in claim 4, wherein the width of said rims of said lid and of said body is substantially equal to the height of said annular wall of said lid.

6. A container as defined in claim 4, wherein said lid consists of sheet metal.

7. A container as defined in claim 4, wherein said body consists of synthetic plastic material.

8. A container as defined in claim 4, wherein said

6

inwardly directed rib is constituted by a circumferential corrugation in the outer face of said side wall defining an inwardly directed recess of a configuration complementary to that of said rib.

9. A container as defined in claim 8, wherein said recess is of a depth adequate to permit the folded rims of an adjacent similar container to be received therein.

10. A container as defined in claim 4, wherein said annular wall of said lid defines a substantially circular outline, and wherein said rim of said body constitutes an inwardly diverging guide surface whereby insertion of said annular wall of said lid into said open end of said body necessarily compels centering of said lid with reference to said open end of said body.

References Cited

UNITED STATES PATENTS

932,597	8/1909	Weber	220—72
1,195,830	8/1916	McWane	138—172
1,431,218	10/1922	Cooke	220—42
1,823,046	9/1931	Hothersall	220—66
3,009,602	11/1961	Raehs	220—67
3,045,871	7/1962	Henrickson	222—143
3,108,710	10/1963	Lange	220—44

FOREIGN PATENTS

572,551	10/1945	Great Britain.
564,054	1/1957	Italy.

30 THERON E. CONDON, *Primary Examiner*.

GEORGE E. LOWRANCE, *Assistant Examiner*.