

Jan. 10, 1967

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3,297,192

HINGED CAP

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2 Sheets-Sheet 1

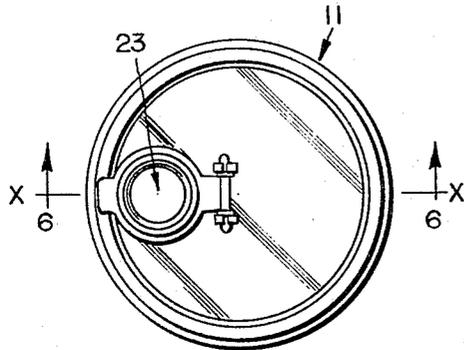


FIG. 3

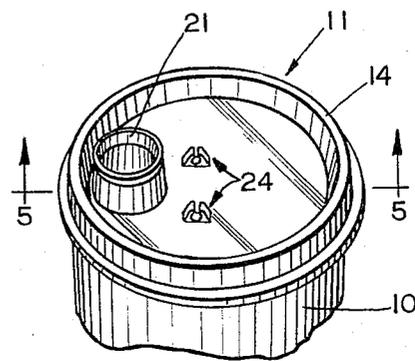


FIG. 1

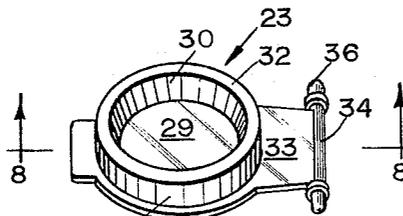


FIG. 7

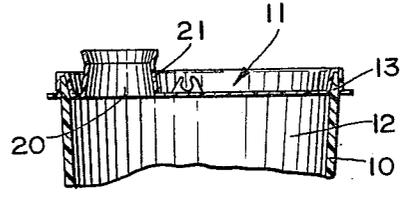


FIG. 5

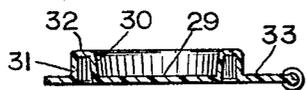


FIG. 8

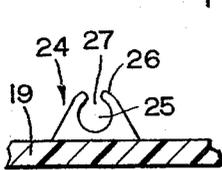


FIG. 9a

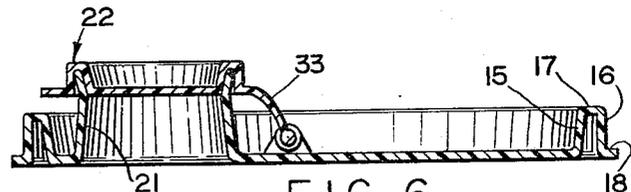


FIG. 6

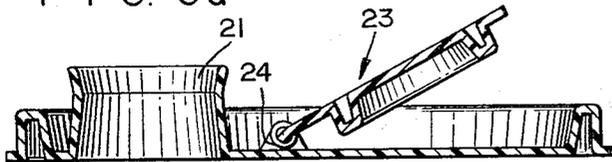


FIG. 9

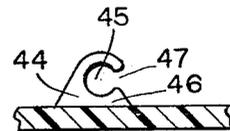


FIG. 10a

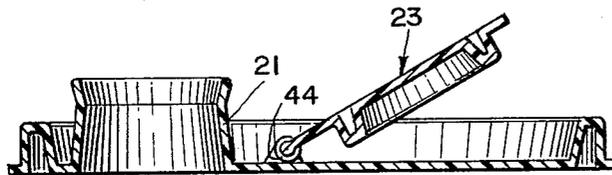


FIG. 10

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2 Sheets-Sheet 2

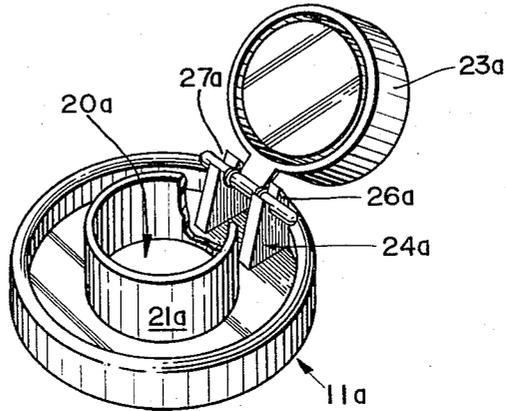


FIG. 2

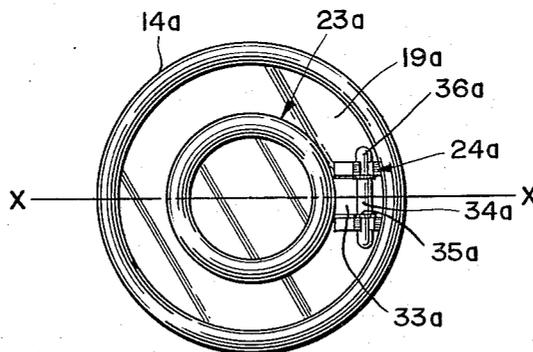


FIG. 4

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1

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6 Claims. (Cl. 220-31)

This invention relates to a new and improved hinge construction particularly adapted for pouring spout lids which are usually pivoted as for instance to the cover of a plastic refrigerator container or the like, and the principal object of the invention resides in the provision of a new and improved hinge construction wherein there is a reduced likelihood of such being accidentally detached during the opening and closing procedures thereof and wherein the lid is more accurately aligned to the spout which it closes for ease in said opening and closing procedures.

The objects of the invention also include the provision of a new and improved hinge construction as described embodying a pair of spaced boss members upwardly and integrally extending from the cover portion of the containers utilized herein wherein said bosses have cavities therein for accommodating the spindles or trunnions of a pivoted hinge construction, these trunnions being further provided with flange members spaced inwardly thereof and apart from each other and adapted for bearing contact with inner surfaces of such bosses.

The objects of the invention furthermore include the provision of a new and improved hinge construction as described embodying the use of a pivoted lid closure member wherein trunnion means are provided therewith for resilient snap engagement with bearing openings formed within upstanding spaced boss members wherein such resilient snap fit engagement is provided by constricted entrances to such bearing openings which are sidewardly directed away from the spout opening in the container top closure surface in a manner so as to reduce the tendency of such trunnions being accidentally dislodged from their pivotal socket positions during the use thereof, which drawback is prevalent among prior art constructions of this type.

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 perspective showing a container and closure therefor with portions of the container cut away and disclosing the general construction of the trunnion and spout opening illustrative of the present invention;

FIGURE 2 is a perspective view of a modified form of container top closure member with portions broken away also embodying the construction principles of the present invention;

FIGURE 3 is a top plan view of the container closure shown in FIGURE 1 of the drawings wherein the pivotal lid member is shown in its closed position;

FIGURE 4 is a top plan view of the modified container closure shown in FIGURE 2 of the drawings wherein the pivotal lid member thereof is shown in closed position;

FIGURE 5 is a sectional view along the line 5-5 of FIGURE 1;

FIGURE 6 is also a sectional view but on an enlarged scale taken on the line 6-6 of FIGURE 3;

FIGURE 7 is a perspective view illustrating the constructional embodiments of the pivotal lid member of the present invention;

2

FIGURE 8 is a sectional view of such pivotal lid member shown in FIGURE 7 and taken along the line 8-8 thereof;

FIGURE 9 is a sectional view of a container top closure and pivoted lid member thereof similar to the showing in FIGURE 6 of the drawing but showing the pivoted lid member in open position;

FIGURE 9a is a partial sectional view on an enlarged scale showing the detail of the upstanding boss shown in FIGURE 9;

FIGURE 10 is a sectional view similar to that shown in FIGURE 9 of the drawing wherein a preferred embodiment directed to the orientation of the restricted entrances to the cylindrical openings within the boss members is clearly apparent; and,

FIGURE 10a is a partial sectional view on an enlarged scale showing the detail of the upstanding boss shown in FIGURE 10.

Throughout the specification, like reference numerals are used to indicate like parts.

Referring now to the drawing and more particularly to FIGURES 1 and 5 thereof, a container 10 having a top closure 11 is illustratively set forth. The open end 12 of the container 10 is surrounded by an upstanding flange portion 13 outwardly flared for receipt of a downwardly directed U-shaped peripheral lip 14 provided on the top closure 11. Such U-shaped lip 14 is provided with an inner wall 15 and an outer wall 16 connected by connecting wall 17 and an outwardly extending flange 18 as best shown by FIGURE 6. The top closure 11 is further provided with a depressed central wall portion 19 having an opening 20 provided therein which opening is preferably offset from the center thereof as shown. Such opening 20 is surrounded by an upstanding peripheral flange 21 which by particular reference to FIGURES 3 and 6 it may be readily ascertained that such flange is adapted for engagement with a downwardly opening U-shaped peripheral lip 22 formed in the pivotal lid member 23 and shaped similarly to the U-shaped lip 14 of the top closure 11.

The central wall 19 of the top closure is further provided with a pair of spaced bosses 24 integral with and extending upwardly therefrom.

The constructional details of each of the bosses 24 are apparent from reference to FIGURE 9a of the drawing in which a cylindrical opening 25 is provided through each of the bosses. It should be noted that these cylindrical openings are axially aligned to each other for receipt of trunnion means as will hereinafter be brought out. The bosses are also spaced an equal distance to each side of a plane $x-x$ passing through the central line of the spout opening 20 as best shown by FIGURE 3 of the drawing. Each boss is further provided with shoulders 26 which define a restricted entrance 27 to the cylindrical opening 25 wherein such entrances are of a width less than the diameter of the cylindrical openings 25.

Referring now in particular to FIGURES 7 and 8 of the drawing, the detailed construction of the pivoted lid member 23 will become more apparent. Such lid member 23 is provided with a closure portion 28 for engagement with the upstanding flange 21 of the spout opening 20. Such closure portion 28 is further provided with an imperforate depressed central portion 29 and is further provided at its peripheral portions with an inner, outer and connecting walls 30, 31 and 32, respectively, so as to define a U-shaped peripheral opening for receipt of the upstanding flange 21 as best shown in FIGURE 6 of the drawing. A connecting strap 33 is also provided on the lid member and extends laterally therefrom in the manner shown in FIGURES 6, 7 and 8. Integral with such connecting strap 33 is a substantially

rod-like axle member 34 having an enlarged flange 35 spaced from either end thereof integral therewith and in spaced relationship to each other. Those portions of the axle member 34 which extend past the flanges 35 at either end thereof are designated as trunnions 36 and are of a general cylindrical cross-sectional configuration and of a dimension so as to generally approximate that of the cylindrical openings 25 for bearing pivotal contact therewith. It should be brought out that the bosses 24 are formed of yieldable flexible plastic such as polyethylene so that the trunnions 36 can be forced inwardly through the respective restricted entrances 27 and be substantially held against removal therefrom by the shoulders 26. Such relationship may be more clearly understood by reference to FIGURES 2 through 4, 9 and 9a wherein the restricted openings 27 thereof are shown in an upward orientation and wherein the lid member 23 may be engaged therewith by forcing such an engagement with the bosses 24 in the direction of the arrow shown in FIGURE 9.

Thus assembled, the flanges 35 serve to control or preferably eliminate the extent to which the pivotal lid member 23 may move laterally in the cylindrical openings 25 with respect to the top closure 11. By thus controlling the lateral movement of such lid member 23, the likelihood of the trunnions 36 slipping from the cylindrical openings 25 which serve as bearing surfaces therefor is reduced and accordingly the accidental displacement of the lid member 23 in respect to the top closure 11 is also reduced. Furthermore, when the outer surface of the flanges 35 engage the inner surfaces of the respective bosses 24 a smoother and more positive pivotal movement of the lid member 23 in engagement and disengagement with the flange 21 of the spout opening 20 is brought about. Also as previously disclosed in relationship with plane $x-x$ of FIGURE 3, the flanges 35 serve to assure the positive positioning of the pivotal lid member 23 so that its peripheral U-shaped opening is in receiving aligned relationship to the upstanding flange 21 of the spout opening 20 and thus serves as a means by which the lid member may be more readily engaged and disengaged therewith.

While the constructional embodiments of the invention as above disclosed have been made in particular relationship with FIGURES 1, 3 and 5 through 9a, it should be pointed out at this time that an alternate form of the invention is shown in FIGURES 2 and 4 to which the above description equally applies. It should be further noted that reference numerals corresponding to said aforementioned descriptions, have been applied to FIGURES 2 and 4 of the drawing but with the addition of a small numeral *a* in each case to designate such alternate embodiments. In such alternate embodiments it should be noted by comparison with those of FIGURES 1, 3 and 5 through 9a that the connecting strap 33a thereof is considerably shorter and the bosses 24a thereof are of increased height in relationship to the spout 21a so that there is no flexing of the connecting strap such as present with connecting strap 33 as shown in FIGURE 6 of the drawings. This construction affords a more accurate alignment in the longitudinal direction between the lid member 23a and the upstanding flange 21a of the spout openings 20a.

It should also be brought out at this time that both of the constructional modifications above described permit the lid member 23 and 23a to be pivotally swung in an arc approximating 180° and is limited only by contact therewith by corresponding portions of the top closure 11 rather than being limited by the constructional aspects of the trunnion and boss means which permit such movement in an arcuate direction.

Turning now to FIGURES 10 and 10a of the drawing, an embodiment is therein disclosed which for some constructional applications is preferred. In such case a restricted entrance 47 somewhat corresponding to entrance

27 of the previous embodiments is shown as sidewardly opening in a direction distal from the position of the upstanding flange 21 of the spout opening 20. In such case the entrance 47 is of a diameter less than that of cylindrical openings 45 provided in each of the upstanding bosses 44 made possible by means of shoulder portions 46. The placement of the pivotal lid member 23 for operational engagement with such modified boss 44 is similar to that as set forth in the previous embodiments with the exception that the connecting movement is provided in the direction of the arrow shown in FIGURE 10 of the drawing. This constructional embodiment is preferred especially in cases where the engagement of the U-shaped peripheral lip of the lid member 23 is dimensioned so as to provide an extra tight seal engagement with the upstanding flange 21 as for the containment of fluids which will be subject to rather violent shaking action and wherein the removal of the lid member from the upstanding flange 21 requires a force of increased magnitude to be upwardly applied thereto by the user's thumb or finger. In such cases, it has been noticed that there is a tendency for the axle, flange and trunnion portions of the lid members to become dislodged from the bosses through the upward movement thereof through the restricted entrances 27 which tendency is materially reduced by the sideward placement of the entrances 47.

From the foregoing, it will be seen that novel and advantageous provisions have been made for carrying out the desired ends. However, attention is directed to the fact that variations may be made in the example hinge construction disclosed herein without departing from the spirit and scope of the invention, as defined in the appended claims.

I claim:

1. A hinge construction for a pivoted lid member comprising a container top wall supporting surface, a spout opening having an upstanding peripheral flange in said supporting surface, the lid member selectively opening and closing the opening by engagement with said peripheral flange thereof,

(a) a pair of spaced bosses integral with and extending upwardly from said supporting surface, each of said bosses having a cylindrical opening therethrough, said cylindrical openings being axially aligned,

(b) means forming shoulders defining restricted entrances to each one of said cylindrical openings, said entrances each being of a width less than the diameter of said cylindrical openings,

(c) said lid member comprising a closure portion for engagement with the upstanding flange of said spout opening, a connecting strap integral with said closure portion, an axle member on said strap at the end thereof distal from said closure portion, said axle member having a pair of flanges each integral and coaxial with said axle member and spaced apart a distance generally equal to the spacing of said bosses, a trunnion on either end of said axle member outwardly of said flanges and in general prolongation and axial alignment with said axle member, said trunnions being of a diameter substantially less than said flanges and the diameters of the trunnions being substantially equal to the diameter of the cylindrical openings of said bosses,

(d) said bosses being formed of yieldable flexible plastic so that said trunnions can be forced inwardly through the respective restricted entrances and being substantially held against removal therefrom by said shoulder forming means.

2. The structure of claim 1 wherein said restricted entrances to said cylindrical openings are sidewardly directed away from said spout opening in a direction approximating the main generally planar said top wall supporting surface.

3. A hinge construction for a pivoted lid member comprising a container top wall supporting surface, a spout

5

opening having an upstanding peripheral flange in said supporting surface, the lid member selectively opening and closing the opening by engagement with said peripheral flange thereof,

- (a) a pair of spaced bosses integral with and extending upwardly from said supporting surface, each of said bosses having a cylindrical opening therethrough, said cylindrical openings being axially aligned,
- (b) means forming shoulders defining restricted entrances to each one of said cylindrical openings, said entrances each being of a width less than the diameter of said cylindrical openings,
- (c) said lid member comprising a closure portion for engagement with the upstanding flange of said spout, a connecting strap integral with said closure portion, an axle member on said strap at the end thereof distal from said closure portion, said axle member being of a generally cylindrical form and having a diameter substantially equal to the diameter of said cylindrical openings through said bosses, said axle member having a pair of generally cylindrical flanges each of a diameter substantially greater than that of said axle member integral and coaxial with said axle member and spaced from either end thereof, said flanges being spaced apart a distance generally equal to the spacing of said bosses, trunnion means on either end of said axle member outwardly of said flanges and in general prolongation thereof,
- (d) said bosses being formed of yieldable flexible plastic so that said trunnions can be forced inwardly

6

through the respective restricted entrances and being substantially held against removal therefrom by said shoulder forming means.

4. The construction as set forth in claim 3 wherein said restricted entrances to said cylindrical openings are side-wardly directed away from said spout opening in a direction approximating the main generally planar said top wall supporting surface.

5. The structure of claim 1 wherein said trunnions are located in a plane beneath that of the spout opening and wherein said connecting strap is under flexure stress when said lid member is in selective closing position in regard to said spout opening so that said lid member is rotatively biased away from said spout opening about said bosses upon opening of said lid member.

6. The structure of claim 3 wherein said trunnions are located in a plane beneath that of the spout opening and wherein said connecting strap is under flexure stress when said lid member is in selective closing position in regard to said spout opening so that said lid member is rotatively biased away from said spout opening about said bosses upon opening of said lid member.

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Theron E. Condon, *Primary Examiner*.