Aug. 16, 1966 I. L. RABB 3,266,681

HINGED SPOUT AND CLOSURE

Filed Feb. 26, 1964

FIG. 1.

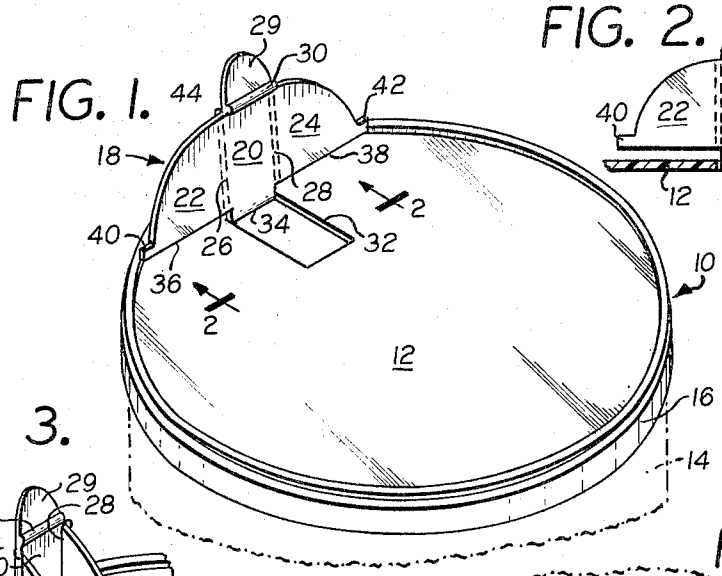


FIG. 2.

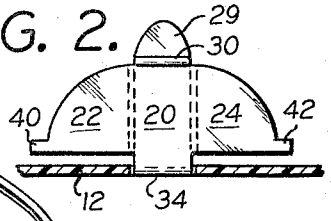


FIG. 3.

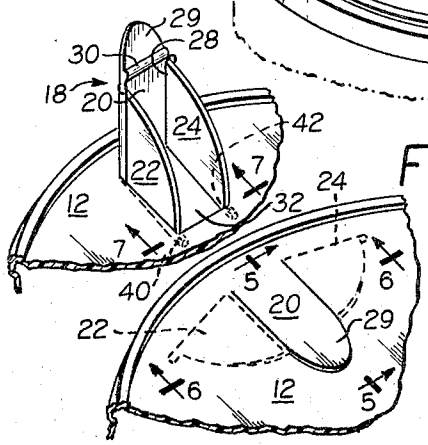


FIG. 4.

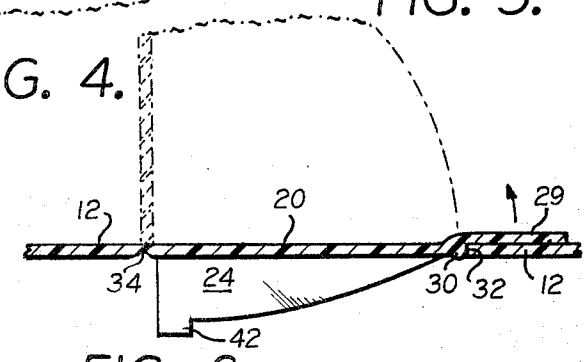


FIG. 5.

FIG. 6.

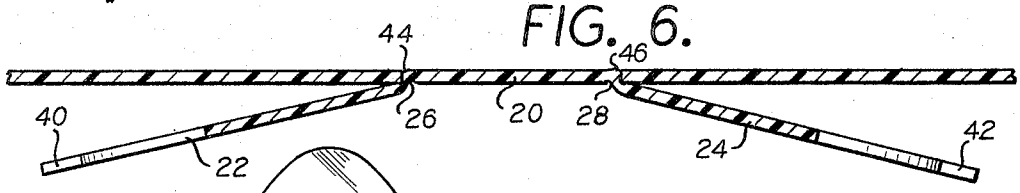


FIG. 7.

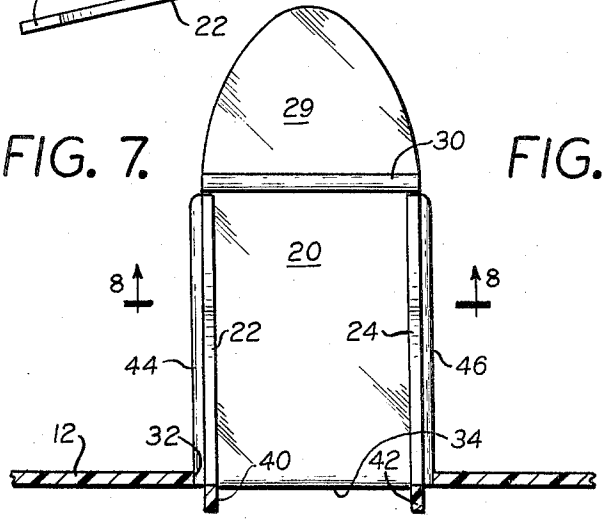
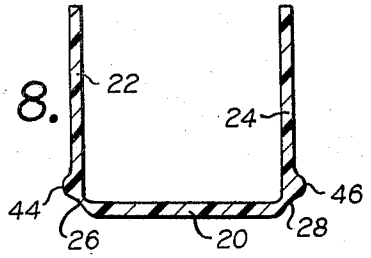


FIG. 8.



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HINGED SPOUT AND CLOSURE

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This invention relates to a closure and particularly to a closure for a container for granular or powdered material. More particularly, the present invention relates to a dispensing type closure having an integral spout formed thereon, the closure being for a container for powdered or granular material.

The main object of the present invention is the provision of a new and improved closure for container for powdered or granular material, which closure is simple and inexpensive of manufacture and efficient in use.

Still another object of the present invention is the provision of a new and improved plastic closure for powdered or granular material which closure is formed of flexible plastic and has an openable spout therein.

Yet another object of the present invention is the provision of a new and improved flexible plastic closure which closure has an openable spout therein, the spout being formed integrally with the closure.

A further object of the present invention is the provision of a new and improved flexible plastic closure for a container, which closure has an openable spout therein adapted to be closed for maintaining the powdered or granular material within the container in fresh condition.

Still another object of the present invention is the provision of a flexible plastic closure having an openable spout therein, which closure and spout may be shipped substantially flat so as not to take up any substantial space.

Still another object of the present invention is the provision of a closure which overlies the peripheral edge of a container and has an integral spout therein, said spout in its closed condition underlying and being substantially coplanar with the main plane of the closure.

The above and other objects, characteristics and features of the present invention will be more fully understood from the following description taken in connection with the accompanying illustrative drawing.

In the drawing:

FIG. 1 is a perspective view of the closure embodying the present invention, as molded;

FIG. 2 is a fragmentary sectional view taken along the line 2—2 in FIG. 1;

FIG. 3 is a fragmentary perspective view of the closure conditioned for use, with the spout open;

FIG. 4 is a view similar to FIG. 3 with the spout closed;

FIG. 5 is a sectional view taken along the line 5—5 in FIG. 4;

FIG. 6 is a sectional view taken along the line 6—6 in FIG. 4;

FIG. 7 is a sectional view taken along the line 7—7 in FIG. 3; and

FIG. 8 is a sectional view taken along the line 8—8 in FIG. 7.

Referring now to the drawing in detail, the closure embodying the present invention is generally designated by the reference numeral 10. The closure is made of a flexible plastic such as, for example, polyethylene, polypropylene, olefin copolymers and vinyl plastics or copolymers of vinyl plastics. The closure 10 is herein shown to have a main plate, here shown as disc 12, which will be connected to any suitable container 14 in any suitable way here shown to be a tight fitting depending peripheral side wall 16. It will be understood that the manner of effecting this connection between the disc 12 and the container 14 may be any manner suitable for the particular use and the close fitting depending peripheral side wall 16 is shown merely by way of example. Assuming the use of the side wall 16, the closure 10 may be proportioned so that the side wall 16 fits tightly about the container 14 to render the closure 10 substantially unremovable or, in the alternative, it may be provided with a close sliding fit over the container 14 to render it movable if desired. In the alternative, the entire container may be formed from plastic material in which event the closure may be integral with the peripheral side wall of the container. However, for the sake of illustration, the present closure 10 is shown as the type which overlies a hermetically sealed metal can in shipment and which serves as the closure after the top of the can has been removed. In such an application, which is herein shown by way of illustration and not by way of limitation, the peripheral side wall 16 of the closure is placed in close confronting relation with the side wall of the container 14.

Container 14 is preferably for a powdered or granular material, hereinafter referred to generally as particulate material. For example, the material in container 14 may be ground coffee, salt, sugar or the like. In any event, it is often desirable to control the flow of such particulate materials by a pouring spout, and the present invention is directed primarily to the provision of a closure with an integral pouring spout which cooperates with an aperture 32 in disc 12 through which the particulate material may flow out of container 14. The spout is generally designated by the reference numeral 18 and includes a closure plate 20 and two side walls 22 and 24. The entire spout 18 is integrally formed, the closure plate 20 being integrally joined to the side 22 through a hinge line 26 and being joined to the side 24 by a hinge line 28, the hinge lines 26 and 28 being formed by providing lines of diminished thickness to thereby yield a flexible integral hinge. The hinges defined by the hinge lines 26 and 28 permit the sides 22 and 24 to bend relative to the cover plate 20 about the hinge lines 26 and 28. A tab 29 is also integrally formed with the plate 20 and the demarcation between these two components is herein defined by a bead 30 which, as will be understood hereinafter, serves to seal the closure plate over its complementary opening 32 in the disc 12 through which the particulate material may exit from the container 14. However, the provision of the bead 30 is desirable but optional, and if it is dispensed with, the tab 29 may still be provided, it being defined by the portion of the cover plate 20 not overlying the aperture 32 in the closure disc 12.

The cover plate 20 is integrally formed with the closure disc 12, the junction between these two elements being defined by a narrowed down line 34 of diminished cross-section defining an integral hinge. It is this hinge about which the entire spout 18 pivots as will be understood hereinafter.

As previously mentioned, FIG. 1 illustrates the closure 10 in its as formed condition, the forming process being preferably an injection molding although other molding, forming and fabricating techniques may be employed. In such a formed condition, it will be seen that the spout 18 extends substantially at right angles upwardly from the plane of the disc 12 with the edges 36 and 38 of the sides 22 and 24 of spout 18 spaced from the disc 12, whereas the cover plate 20 of the spout is joined to the disc 12 at the integral hinge 34. The spout 18 could be similarly formed with respect to the disc 12 but depending therefrom rather than extending upwardly therefrom without departing from the present invention.

The sides 22 and 24 are both substantially quadrant shaped with lines 26 and 36 forming the radial sides or

edges of the quadrant constituting side **22**, and with lines **28** and **38** forming the radial sides or edges of the quadrant forming side **24**. This shape provides clearance between the sides of the spout and the forward edge of aperture **32** during movement of spout **18**.

To arrange the spout **18** for use, the sides **22** and **24** are bent toward one another along their respective integral hinges **26** and **28** to form the spout into a U-shape as viewed in cross-section (FIG. 8). Thereupon, the sides **22** and **24** are forced through the aperture **32** in the disc **12** so that their edges **36** and **38** are disposed below the plane of the disc. To hold the spout in such condition that the edges **36** and **38** remain below the plane of the disc, suitable stop means are provided on the sides to abut against the disc **12** when the spout is moved to its open condition, as shown in FIG. 3, to prevent the accidental removal of the spout **18** from the inside of the closure. As shown herein, the stop means are two outwardly extending tabs **40** and **42** formed along the edges **36** and **38** of the sides **22** and **24**, respectively, and extending outwardly along said edges. It will be understood that the stop means could extend outwardly from the sides **22** and **24** perpendicular to the plane of said sides and still function satisfactorily. Other forms of stop means could be provided as will be readily understood by those skilled in the art.

Thus, with the spout in open condition as shown in FIG. 3, the spout **18** will be substantially U-shaped with the sides **22** and **24** bent at right angles to the cover plate **20** along their integral hinges **26** and **28**, respectively, and with the stop means **40** and **42** in abutting relation with the under surface of the disc **12** of the closure **10**. When it is desired to close the spout **18**, all that need be done is to push the cover plate **20** down toward the disc **12** and thereby cause it to pivot about its integral hinge line **34** to move it into substantially coplanar relation with the disc **12** overlying the aperture **32** therein. In this condition the sides **22** and **24** will move downwardly and may flex outwardly as shown best in FIGS. 4, 5 and 6 so as to not increase substantially the thickness of the closure **10**. This permits economical shipping and eliminates interference with stacking. In this condition it will be seen that the tab **29** will overlie a portion of the disc **12** and will thereby provide means for gripping the spout **18** to return it to its open condition as shown in FIG. 3.

As previously noted, the spout **18** may be provided with a bead **30** to effect a tighter seal between the spout and the disc **12** in the closed condition. This may be provided merely by placing the forward edge of the bead **12** in close confronting or abutting relation with the forward edge of the aperture **32** opposite the bead when the spout **18** is in closed condition. In addition, if desired, a snap closing and opening action can be provided by the bead **32** by providing it with a slight undercut so that it will snap under the disc **12** when the cover plate **20** is substantially coplanar with the disc **12**. Additional closing or sealing action can be achieved with the present construction by providing two side sealing beads **44** and **46** on the sides **22** and **24** of the spout **18**, the beads being provided closely adjacent the integral hinges **26** and **28**, respectively, and extending substantially the full length of said integral hinges. With the additional beads **44** and **46** provided, when the spout **18** is in its closed condition as shown in FIG. 4, the beads may jam in along the sides of the aperture **32** confronting them to give a close sealing fit or they may also be undercut to provide additional snap action. However, it will be recognized that the beads **30**, **44** and **46**, while desirable, are optional, and the integrally formed pouring spout may be provided without including them.

As shown and described herein the aperture **32** in disc **12** and the cover plate **20** of spout **18**, which is complementary to the aperture **32**, are both rectangular. However, it will be understood that other shapes may be employed without departing from the present invention. Thus the aperture and cover plate may be trapezoidal or triangular. Other shapes are also possible although less convenient. In view of the obviousness of the change in shape of the aperture **32** and the cover plate **20**, it will be understood that the present invention is intended to include within its scope any shape of cover plate and aperture.

While I have herein shown and described the preferred form of the present invention and have suggested various modifications therein, other changes and modifications may be made therein within the scope of the appended claims without departing from the spirit and scope of this invention.

What I claim is:

1. A closure comprising a plate of flexible plastic material having an aperture therein, said aperture having two sides, an end joining said sides and an area opposite said end, and a spout for openably closing said aperture, said spout comprising a pair of sides and a cover plate integrally joined to said two sides along lines of diminished thickness, said spout being bent along said lines of diminished thickness into a U-shape with the cover plate forming the bight of the U, said cover plate being shaped substantially the same as said aperture and being integrally joined to said first mentioned plate in said area opposite said end of said aperture by a zone of diminished thickness, whereby to pivotally mount said spout for movement from and to a closed position in which said cover plate is substantially coplanar with said first mentioned plate and to and from an open position in which said cover plate is substantially perpendicular to said first mentioned plate, each of said spout sides being substantially quadrant shaped with the center of said quadrant being substantially at said area opposite said end of said aperture and the radius of said quadrant being equal substantially to the length of said aperture between the end thereof and the area opposite said end, each side of said spout having one edge defined by the line of diminished thickness joining said side of said spout to said cover plate, a second edge perpendicular thereto and extending away from said cover plate, and an arcuate edge extending between said two perpendicular edges, each of said sides having a radially extending stop adjacent said second radial edge thereof for engaging said first mentioned plate for limiting the movement of said spout beyond its open position, a tab integrally formed with said cover plate and extending outwardly therefrom away from the zone of joining between said cover plate and said first mentioned plate for overlying said first mentioned plate when said spout is in said closed position, a bead on said cover plate extending between said spout sides and along the junction with said tab for engaging the end of said aperture when said spout is in closed position, and a pair of beads on said sides extending along the radial edges thereof joined to said cover plate.

2. A closure comprising a plate of flexible plastic having an aperture therein, and a spout of said plastic integrally formed with said plate to openably close said aperture, said spout comprising a cover plate of given thickness joined to said first mentioned plate along one edge of said cover plate and said aperture by a line of material of reduced thickness, whereby to form an integral hinge between said spout and said first mentioned plate, and two quadrant-shaped sides joined to said cover plate along its two sides by lines of material of reduced thickness, whereby to form integral hinges between said cover plate and said quadrant-shaped sides to render said quadrant-shaped sides bendable relative to said cover plate, the edges of said quadrant-shaped sides closest to said first mentioned plate in formation being spaced from said first mentioned plate, the centers of the circles defining the arcuate peripheral portions of said quadrant-shaped sides being located substantially at the intersections between the edges of said sides joined to said cover plate

and the edges of said sides spaced from said first mentioned plate, and the radius of said circles being substantially equal to the dimension of said aperture extending perpendicular from the edge of said aperture joined to said cover plate, the dimension of said cover plate extending away from the edge thereof joined to said edge of said aperture being greater than the corresponding dimension of said aperture, whereby a portion of the cover plate overlies said first mentioned plate when said cover plate is substantially coplanar with said first mentioned plate to yield a tab for gripping said spout, and a bead on said cover plate abutting against the edge of said aperture remote from the edge joined to said cover plate when said cover plate is substantially coplanar with said first mentioned plate.

3. A closure comprising a plate of flexible plastic having an aperture therein, and a spout of said plastic integrally formed with said plate to openably close said aperture, said spout comprising a cover plate of given thickness joined to said first mentioned plate along one edge of said cover plate and said aperture by a line of material of reduced thickness, whereby to form an integral hinge between said spout and said first mentioned plate, and two quadrant-shaped sides joined to said cover plate along its two sides by lines of material of reduced thickness, whereby to form integral hinges between said cover plate and said quadrant-shaped sides to render said quadrant-shaped sides bendable relative to said cover plate, the edges of said quadrant-shaped sides closest to said first mentioned plate in formation being spaced from said first mentioned plate, the center of the circles defining the arcuate peripheral portions of said quadrant-shaped sides being located substantially at the intersections between the edges of said sides joined to said cover plate and the edges of said sides spaced from said first mentioned plate, and the radius of said circles being substantially equal to the dimension of said aperture extending perpendicular from the edge of said aperture joined to said cover plate, the dimension of said cover plate extending away from the edge thereof joined to said edge of said aperture being greater than the corresponding dimension of said aperture, whereby a portion of the cover plate overlies said first mentioned plate when said cover plate is substantially coplanar with said first mentioned plate to yield a tab for gripping said spout, and beads on said quadrant-shaped sides along the lines joining said quadrant-shaped sides to said cover plate.

4. The closure of claim 2, further comprising beads on said sides along the lines joining said sides to said cover plate.

5. A closure comprising a plate of flexible plastic material having an aperture therein, said aperture having two sides, an end joining said sides and an area opposite said end, and a spout for openably closing said aperture, said spout comprising a pair of quadrant-shaped sides and a cover plate integrally joined to said two quadrant-shaped sides along lines of reduced thickness, said spout being bent along said lines of reduced thickness into a U-shape with the cover plate forming the bight of the U, said cover plate being shaped substantially the same as said aperture and being integrally joined to said first mentioned plate in said area opposite said end of said aperture by a zone of reduced thickness, whereby to pivotally mount said spout for movement from and to a closed position in which said cover plate is substantially coplanar with said first mentioned plate and to and from an open position in which said cover plate is substantially perpendicular to said first mentioned plate, each quadrant-shaped side of said spout having one edge defined by the line of reduced thickness joining said side of the spout to said cover plate, a second edge perpendicular thereto and extending away from said cover plate, and an arcuate edge extending between said two perpendicular edges, said quadrant-shaped sides each having the center of said arcuate edge located substantially at said area opposite said end of said aperture and the radius of said quadrant being equal substantially to the length of said aperture between the end thereof and the area opposite said end, stop means integrally formed on at least one of said quadrant shaped sides in the area defined by the intersection of the arcuate edge and said second edge, a tab integrally formed with said cover plate and extending outwardly therefrom away from the zone of joining between said cover plate and said first mentioned plate, and an integral bead on said cover plate extending between said spout sides and along the junction with said tab for engaging the end of said aperture when said spout is in closed position.

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