Jan. 13, 1953 P. J. MURPHY 2,625,306

DISPENSING CLOSURE

Filed Feb. 23, 1950 2 SHEETS—SHEET 1

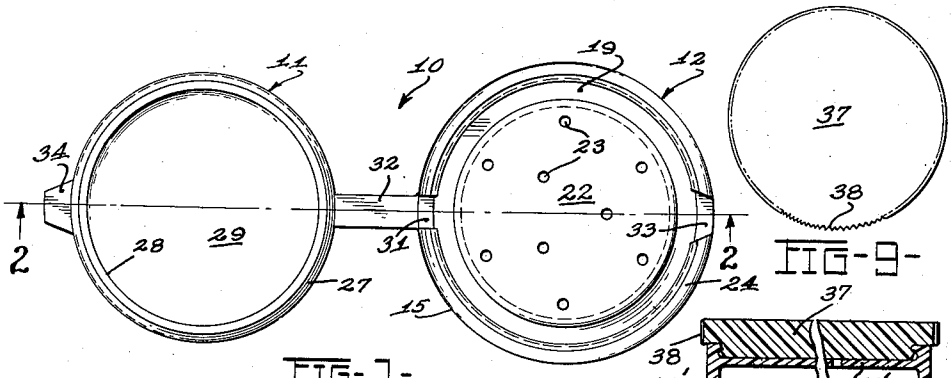


FIG-1-

FIG-9-

FIG-10-

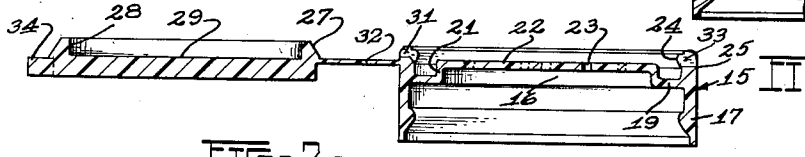


FIG-2-

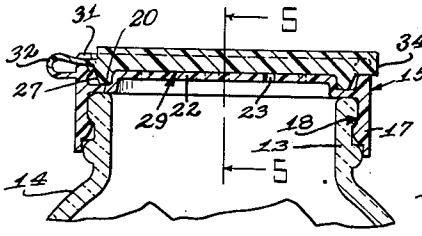


FIG-3-

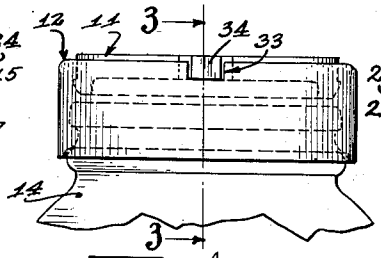


FIG-4-

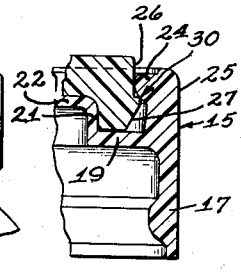


FIG-5-

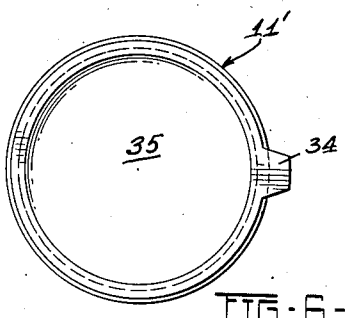


FIG-6-

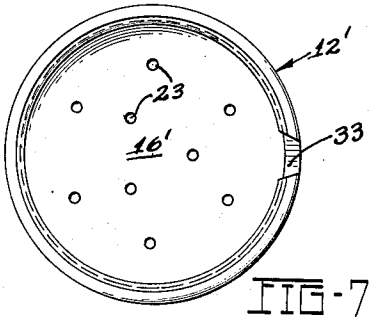


FIG-7-

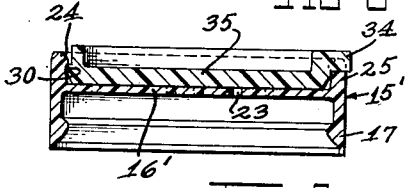


FIG-8-

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Jan. 13, 1953 P. J. MURPHY 2,625,306

DISPENSING CLOSURE

Filed Feb. 23, 1950 2 SHEETS—SHEET 2

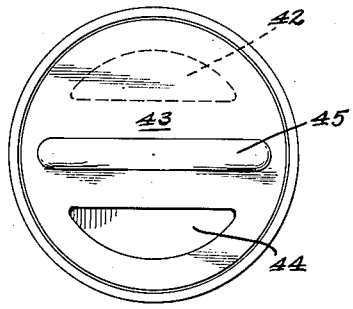


FIG-11-

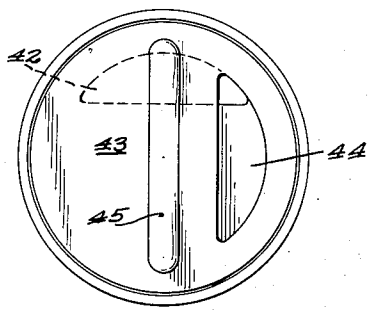


FIG-12-

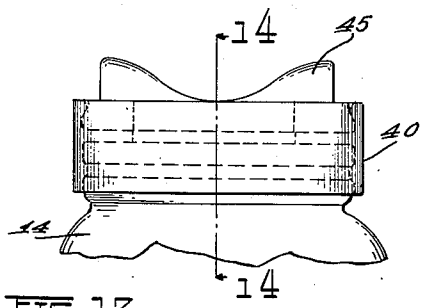


FIG-13-

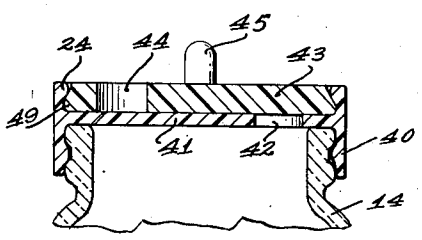


FIG-14-

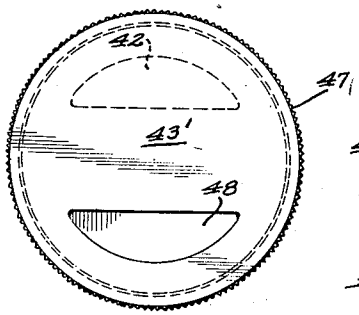


FIG-15-

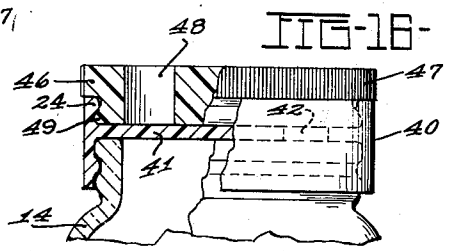


FIG-16-

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Patented Jan. 13, 1953

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UNITED STATES PATENT OFFICE

2,625,306.

DISPENSING CLOSURE

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Application February 23, 1950, Serial No. 145,814

29 Claims. (Cl. 222—498)

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This invention relates to dispensing closures for containers, such as are usually provided for products like spices, condiments, dentifrice powders, cosmetic powders, medicinal powders, pills and tablets. The closure as herein described is adapted for use with containers made of glass, tin, fiber and the like.

An object of my invention is to provide a dispensing closure which may be readily and easily applied to and removed from a container.

Another object of the invention is to provide a dispensing closure which will produce an efficient original seal.

Another object of the invention is to provide a dispensing closure having a portion which is removable to uncover openings for dispensing and which is easily replaceable to re-establish an effective and efficient seal.

Another object of the invention is to provide a dispensing closure having a portion which is rotatable to uncover openings for dispensing and easily rotatable to re-establish an effective and efficient seal.

Other objects of the invention will appear hereinafter.

Basically, the dispensing closure, herein described, comprises a cylindrical wall adapted to fit over the neck of a container, a perforated transverse wall spaced intermediate the top and bottom of the cylindrical wall, and a cover piece in the form of an insert adapted to fit in the upper portion of the cylindrical wall and thereby cover and seal the perforations in the transverse wall. This insert may be easily displaced to uncover the perforations.

Referring to the accompanying drawings:

Fig. 1 is a plan view of the closure.

Fig. 2 is a sectional elevational view of the closure at the line 2—2 on Fig. 1.

Fig. 3 is a sectional elevational view at the line 3—3 on Fig. 4.

Fig. 4 is an elevational view showing the closure applied to the container.

Fig. 5 is a fragmentary sectional view of the closure at the line 5—5 on Fig. 3.

Fig. 6 is a plan view of the cover or sealing disk of a modified form of the closure.

Fig. 7 is a plan view of the body portion which cooperates with the cover shown in Fig. 6.

Fig. 8 is a sectional elevational view of the modified form of the closure shown in Figs. 6 and 7 with the cover in sealing position.

Fig. 9 is a plan view of another modified form of the closure.

Fig. 10 is a sectional elevational view of the modified form shown in Fig. 9.

Fig. 11 is a plan view of another modified form

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of the closure with the opening entirely covered.

Fig. 12 is a plan view of the closure in Fig. 11 with the opening partially uncovered.

Fig. 13 is an elevational view of the modified form shown in Fig. 11 as applied to the container.

Fig. 14 is a sectional view at the line 14—14 on Fig. 13.

Fig. 15 is a plan view of another modified form of the closure.

Fig. 16 is a part-sectional elevational view of the modified form of closure shown in Fig. 15 and the container to which it is applied.

As shown in Fig. 1, the closure 10 consists of a cover 11 and a body portion 12 made of flexible thermoplastic molding compound such as polyethylene, or other material having similar physical properties. The closure is adapted to be used with a container 14 as hereinafter described.

The body portion 12 comprises a cylindrical wall 15 and a diaphragm 16 spaced intermediate the top and bottom of the cylindrical wall 15. The inner surface of the lower part 17 of the cylindrical wall is shaped to maintain sealing contact with the side sealing surface 18 of the container neck 13 (Fig. 3). The diaphragm 16 includes a flat circular plate 22, a rim 19 offset downwardly therefrom, and a vertical annular wall 21 at the periphery of the circular plate, connecting the plate 22 to the rim 19 (Fig. 2). The rim 19 is positioned to make sealing contact with the top 20 of the container neck 13. The plate 22 is formed with perforations 23 as shown in Figs. 1 and 2. The upper part 25 of the cylindrical wall 15 is formed with an annular bead 24 on its inner surface.

The periphery of the cover 11 is formed with a vertical surface 26 (Fig. 5) and a bevelled surface 27. The maximum diameter of the bevelled surface 27 is greater than the diameter of the vertical surface 26 thereby forming a projecting lip 30. The inner portion of the cover is cut away leaving an inner wall 28 concentric with the bevelled surface 27.

As shown in Fig. 3, when the cover is snapped into the top of the body portion, the inner wall 28 fits over the vertical wall 21 and the bottom 29 of the cover seals tightly against the top of the circular plate 22. The projecting lip 30 snaps into position below the annular bead 24 and insures the maintenance of the seal.

The body portion is provided with a notch 31 adapted to receive a portion of a web 32 connecting the cover 11 and body portion 12, and with a notch 33 adapted to receive a tab 34 on the cover 11 (Figs. 2 and 3).

It should be noted that all the elements of the

closure are so designed that the entire closure may be molded in one piece.

After the closure has been molded, the closure may be shipped to the packer in the condition shown in Fig. 2 or the closure may be shipped with the cover snapped into position. The latter is preferable since less shipping space is required and since the chances of severing the web connecting the cover and body portion are diminished.

After the container has been filled and it is desired to seal the container, the closure is snapped onto the neck of the container as shown in Figs. 3 and 4. Since a very good seal has been previously obtained between the cover and the body portion, a highly satisfactory package is obtained.

After the package reaches the consumer and it is desired to dispense some of the contents, the consumer need only lift the cover 11 by the tab 34, expose the circular plate 22, and dispense the amount desired. The cover 11 meanwhile remains connected to the package by the web 32. After the desired amount has been dispensed, the package may be resealed by pushing the cover back into place. The reseal obtained will be equally as efficient as the original seal.

A modified form of the invention is shown in Figs. 6, 7 and 8. In this form of the invention, the diaphragm 16 of the body portion (Fig. 2) has been modified and as shown in Fig. 8 as 16', comprises a flat perforated disk entirely in one plane. The cover 11' comprises a disk 35 adapted to make sealing contact with the upper surface of the diaphragm 16'. The periphery of the cover 11' is formed in the same manner as that of the cover 11 in the other form of my invention.

The web 32 and corresponding notch 31 (Fig. 2) have been omitted in the modified form (Fig. 8). The method of sealing is identical in these two forms of the invention in that the cover 11' snaps into position providing a sealing contact between the surfaces of the diaphragm 16' and the disk 35. A comparison of these two forms of my invention is most readily apparent by a study of Figs. 3 and 8.

Another modified form of my invention is shown in Figs. 9 and 10. In this form, the cover 37 is provided with a corrugated lip 38 which overlies the upper part of the cylindrical wall. This lip may be grasped at any point to lift the insert. This modified form operates in other respects in the same manner as the closure in Figs. 6, 7 and 8.

Another modified form of my invention is shown in Figs. 11, 12, 13 and 14. In this form, the cylindrical wall 40 is provided with a disk 41 intermediate the top and bottom. This disk has an opening 42 as shown in Figs. 11 and 12. The cover 43 is flat and adapted to fit into the upper part of the body in the same manner as in the other forms of my invention. The periphery of the insert 43 is formed with a projecting edge 49 which is adapted to snap below the annular bead 24 and maintain the insert in position. The cover is also formed with an elongated opening 44 which is preferably of the same size and shape as the opening 42 in the disk 41. The upper surface of the cover 43 is flush with the top of the cylindrical wall and is provided with an elongated knob or handle 45 which may be dished (Fig. 13) and is easily grasped to rotate the insert and bring the openings into register when it is desired to dispense the contents of the container. The cover may be rotated to bring the openings partially into register as shown in Fig. 12, or entirely into register. Due to the peculiar physical properties of polyethylene, a very effective seal is provided and at the same time, the cover is easily rotatable to uncover or cover the openings.

Another modified form of my invention is shown in Figs. 15 and 16. In this form of the invention, the cylindrical wall 40 and disk 41 are identical with those shown in Figs. 11, 12, 13, and 14. The cover 43' is formed with a projecting portion 46 extending over the top surface of the cylindrical wall and with corrugations 47. The cover is formed with a dispensing opening 48. When it is desired to dispense the contents, the cover may be grasped and rotated to bring the openings into register.

Modifications may be resorted to within the spirit and scope of my invention.

I claim:

1. A dispensing closure made of flexible, resilient material and comprising a cylindrical wall, means forming a part of the lower portion of the cylindrical wall for effecting sealing contact with the side surface of the neck of a container, an integral thin transverse wall spaced intermediate the top and bottom of said cylindrical wall to make sealing contact with the upper surface of the container neck, said transverse wall being perforated, and a circular disk in frictional holding engagement with the cylindrical wall and held thereby in sealing contact with the upper surface of said transverse wall and readily separable from said walls by upward vertical movement out of sealing contact and away from the transverse wall and the cylindrical wall.

2. A dispensing closure made of flexible, resilient material and comprising a cylindrical wall, means forming a part of the lower portion of the cylindrical wall for effecting sealing contact with the outer surface of a container neck, an integral thin transverse wall spaced intermediate the top and bottom of said cylindrical wall to make sealing contact with the upper surface of the container neck, said transverse wall being perforated, a disk made of flexible, resilient material, means forming a part of said disk for effecting readily separable sealing contact with the upper surface of said transverse wall and the inside surface of the upper portion of said cylindrical wall, said disk being movable by upward vertical movement out of sealing contact and away from the transverse wall and the cylindrical wall.

3. The closure defined in claim 1, including means for grasping said disk to remove it from sealing contact and means whereby said disk remains attached to said cylindrical wall after its removal.

4. A dispensing closure made of flexible material comprising a cylindrical wall, the inside surface of the lower portion of said cylindrical wall being shaped to effect sealing contact with the outer surface of a container neck, a rim spaced intermediate the top and bottom of said cylindrical wall to make sealing contact with the upper surface of the container neck, a circular plate spaced intermediate the top and bottom of said cylindrical wall and in a different plane than said rim, said plate having a diameter less than the inner diameter of said cylindrical wall, a thin web at the periphery of said plate and connecting said plate to the rim, said plate being perforated, and a circular cover, means forming a part of said cover for effecting sealing contact with the upper surface of said plate and the inside surface of said cylindrical wall.

5. A dispensing closure made of flexible material comprising a cylindrical wall, means forming a part of the lower inside portion of said cylindrical wall for effecting sealing contact with the outer surface of a container neck, a rim spaced intermediate the top and bottom of said cylindrical wall to make sealing contact with the upper surface of a container neck, a thin wall projecting upward from the inner circumference of said rim, a perforated disk positioned over the top of said thin wall and having substantially the same diameter as said thin wall, and a cover, means forming a part of said cover for making sealing contact with the upper surface of said disk and the inside surface of said cylindrical wall.

6. A dispensing closure made of flexible material comprising a cylindrical wall, means forming a part of the lower portion of said cylindrical wall for effecting sealing contact with the outer surface of a container neck, a rim spaced intermediate the top and bottom of said cylindrical wall to make sealing contact with the upper surface of the container neck, a circular plate spaced above said rim and in a plane parallel to the plane of said rim, said plate having a diameter less than the inner diameter of said cylindrical wall, a thin web entirely around the periphery of said plate and connecting said plate to the rim, said plate being perforated, a disk having a horizontal portion in sealing contact with the upper surface of the plate, an annular bead formed on the inner surface of the upper portion of said cylindrical wall, said disk having a projecting edge about its circumference to provide a locking engagement with said bead when the disk is brought into sealing contact with the plate.

7. A dispensing closure made of flexible material comprising a cylindrical wall, means forming a part of the lower portion of said cylindrical wall for effecting sealing contact with the outer surface of a container neck, a rim spaced intermediate the top and bottom of said cylindrical wall to make sealing contact with the upper surface of the container neck, a circular plate spaced intermediate the top and bottom of said cylindrical wall and in a different plane than said rim, said plate having a diameter less than the inner diameter of said cylindrical wall, a thin web entirely surrounding said plate at its periphery and connecting said plate to the rim, said plate being perforated, a cover having a horizontal portion to make sealing contact with the upper surface of the plate, and a downwardly projecting ring to make sealing contact with the outer surface of the cylindrical web, and an annular bead positioned on the inner surface of the upper portion of said cylindrical wall, said cover having a projecting edge about its periphery to provide a locking engagement with said bead when the cover is brought into sealing contact with the plate.

8. The closure defined in claim 7, including means for grasping said cover to remove it from sealing contact and means whereby said cover remains attached to said cylindrical wall after its removal.

9. The closure defined in claim 8, the means for grasping said cover comprising a tab at the periphery of said cover and in the plane of the top of said cover, said cylindrical wall having a portion of its upper wall cut away to receive said tab when the cover is in sealing contact with the plate.

10. The closure defined in claim 9, said means whereby said cover remains attached to the cylindrical wall comprising a flexible web connected to the periphery of said cover at a point diametrically opposed to said tab and connected to the upper portion of said cylindrical wall, said cylindrical wall having a portion cut away to receive said web when the cover is in sealing contact with said plate.

11. A dispensing closure made of flexible, resilient material and comprising a cylindrical wall, means forming a part of the lower portion of said cylindrical wall for effecting a sealing contact with the outer surface of a container neck, an integral thin transverse wall spaced intermediate the top and bottom of said cylindrical wall to make sealing contact with the upper surface of the container neck, said transverse wall being perforated, a disk of flexible, resilient material in sealing contact with the upper surface of said transverse wall, said disk having a projecting edge at the lower portion of its periphery, an annular bead on the inside surface of the upper portion of said cylindrical wall, the diameter of said wall at said bead being less than the diameter of said disk at the projecting edge such that the projecting edge snaps below said annular bead and provides a readily separable locking engagement when the disk is in sealing contact with the plate and the disk may be lifted out of contact with and free from the transverse and cylindrical walls by upward vertical movement.

12. The closure defined in claim 11 including means for grasping said disk to remove it from sealing contact and means whereby said disk remains attached to said cylindrical wall after its removal.

13. The closure defined in claim 12, the means for grasping said disk comprising a tab at the outer extremity of said disk and in the plane of the top of said disk, said cylindrical wall having a portion of its upper wall cut away to receive said tab when the disk is in sealing contact with the plate.

14. The closure defined in claim 13, said means whereby said disk remains attached to said cylindrical wall comprising a flexible web connected to the extremity of said disk at a point diametrically opposed to said tab and connected to the upper portion of said cylindrical wall, said cylindrical wall having a portion cut away to receive said web when the disk is in sealing contact with said plate.

15. The combination of a container formed with a neck and a closure made of flexible, resilient material and comprising a vertical wall, means for providing a sealing contact between said vertical wall and said neck, an integral thin transverse wall spaced intermediate the top and bottom of said vertical wall, means forming a part of said transverse wall for effecting sealing contact with the top surface of said neck, said transverse wall being formed with a dispensing aperture, a disk in sealing contact with the upper surface of said transverse wall, and inter-engaging means forming a part of said disk and cylindrical wall for locking said disk when in sealing contact, said disk being liftable out of contact with and free from the transverse and cylindrical walls by upward vertical movement.

16. The combination defined in claim 15, said means for locking said disk when in sealing contact comprising an annular bead positioned on the inner surface of the upper portion of said cylindrical wall, said disk having a projecting edge at its periphery which snaps below said an-

nular bead and locks said disk in sealing contact with the transverse wall.

17. A dispensing closure comprising a cylindrical wall, a transverse partition intermediate the ends of said cylindrical wall, said partition having a dispensing opening, means forming a part of one end of the cylindrical wall for effecting readily separable connection between the same and a container, a closure member so constructed and arranged within the other end of said cylindrical wall to cover said dispensing opening and providing a readily separable sealing contact with the partition, said closure member being liftable out of contact and away from the cylindrical wall by an upward vertical movement, and means whereby the closure member may be moved to a position to uncover said opening.

18. A dispensing closure comprising a cylindrical wall, a transverse partition intermediate the ends of said cylindrical wall, said partition having a dispensing opening, means forming a part of one end of the cylindrical wall for effecting readily separable connection between the same and a container, a closure member within the other end of the said cylindrical wall and covering said dispensing opening and held in readily separable sealing contact with the partition, said closure member being liftable out of contact and away from the cylindrical wall by an upward vertical movement, and means for moving the closure to a position to uncover said opening, said closure member having an opening adapted for registration with the dispensing opening at times.

19. The combination of a container formed with a circular neck, and a closure comprising a cylindrical wall, the inner surface of the lower portion of said wall shaped to conform to the outer contour of the neck and make sealing contact therewith, an integral thin perforated transverse wall spaced intermediate the top and bottom of said cylindrical wall in sealing contact with the top surface of the container neck, a disk in sealing contact with the upper surface of said transverse wall, and means for releasably holding said disk in said sealing contact.

20. The combination of a container formed with a neck and a closure comprising a cylindrical wall, the lower part of said cylindrical wall being shaped to conform to the surface of the neck, a rim spaced intermediate the top and bottom of said cylindrical wall in sealing contact with the upper surface of the container neck, a circular plate spaced intermediate the top and bottom of said cylindrical wall and in a different plane than said rim, said plate having a diameter less than the inner diameter of said cylindrical wall, a thin web entirely surrounding said plate at its periphery and connecting said plate to the annular disk, said plate being perforated, a cover having a horizontal portion to make sealing contact with the upper surface of the plate, and a downwardly projecting ring to make sealing contact with the outer surface of the cylindrical web, an annular bead positioned on the inner surface of the upper portion of said cylindrical wall, said cover having a projecting edge about its periphery to provide a locking engagement with said bead when the cover is brought into sealing contact with the plate.

21. A dispensing closure for containers, said closure consisting of flexible material and comprising a cylindrical wall, the lower portion of said wall having an inner sealing surface for sealing contact with the outer surface of a container neck, a diaphragm within said cylindrical wall and spaced intermediate the top and bottom of said wall, said diaphragm including a body portion in the form of a circular plate of smaller diameter than the interior surface of said wall, a rim stepped below said body and a web surrounding said plate at its periphery and uniting said plate with said rim, said plate being formed with a dispensing opening therethrough, a cover overlying and in sealing contact with the upper surface of said plate, said cover being formed with an annular rib on its lower surface and in sealing contact with the outer surface of the said web, an annular bead formed on the inner side of the upper portion of said cylindrical wall, said cover having a circumferential projecting edge portion at its periphery and positioned beneath and in locking engagement with the said bead when the cover is in sealing contact with the said plate.

22. The combination defined in claim 15, said disk having an aperture and lying upon and movable about the axis of said transverse wall into and out of a position in which said apertures are in register, means attached to said disk to facilitate manual rotation of the disk relative to said transverse wall.

23. The combination defined in claim 22, said means to facilitate rotation of the disk comprising a vertical projection along a diameter of said disk.

24. The combination defined in claim 22, said means to facilitate rotation of the disk comprising a radial projection at the periphery of said disk overlying the adjacent end of the cylindrical wall.

25. The closure defined in claim 1, including means for grasping said disk to remove it from sealing contact.

26. The closure defined in claim 25, said means for grasping said disk comprising a tab at the periphery of said cover and in the plane of the top of said cover.

27. The closure defined in claim 11 including means for grasping said disk to remove it from sealing contact.

28. The closure defined in claim 27, said means for grasping said disk comprising a tab at the periphery of said cover and in the plane of the top of said cover.

29. The closure defined in claim 27, said means for grasping said disk comprising a radial projection at the periphery of said disk overlying the adjacent end of the cylindrical wall.

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