Oct. 25, 1955 J. D. REIFSNYDER ET AL 2,721,686

CONTAINER CLOSURE WITH TRANSPARENT PANE

Filed Nov. 7, 1950

Fig. 1.

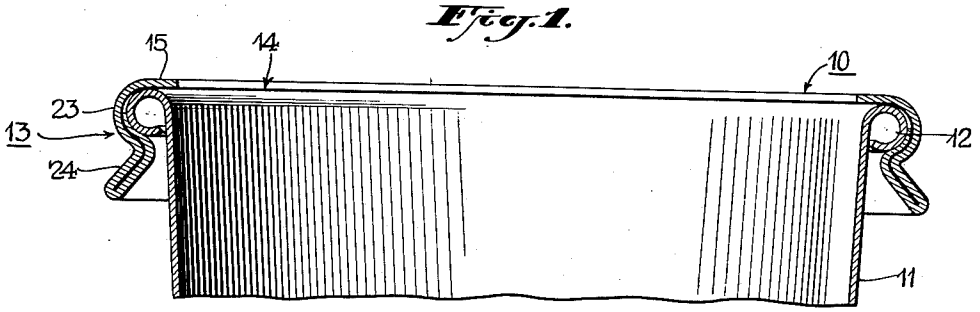


Fig. 2.

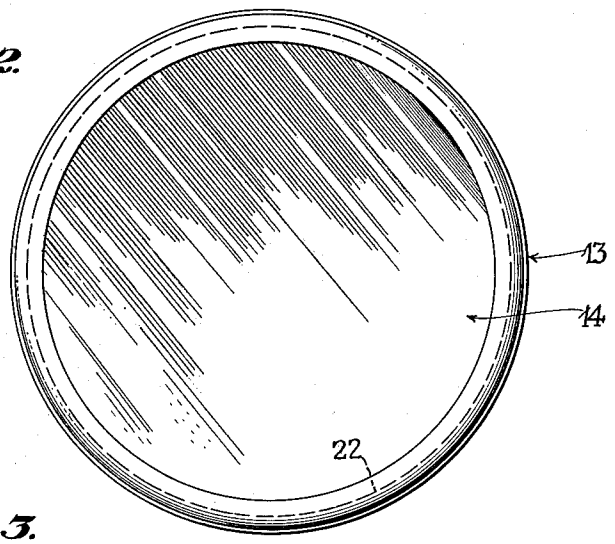


Fig. 3.



Fig. 5.

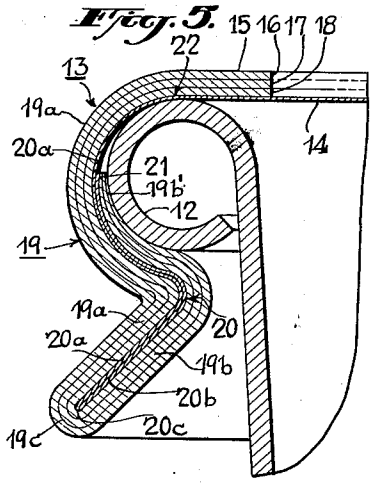
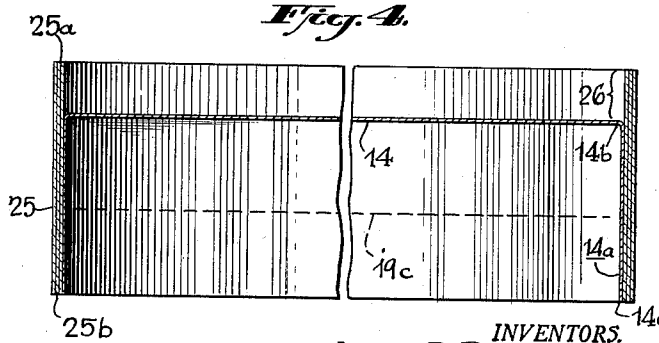


Fig. 4.



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United States Patent Office 2,721,686
Patented Oct. 25, 1955

2,721,686

CONTAINER CLOSURE WITH TRANSPARENT PANE

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Application November 7, 1950, Serial No. 194,534

8 Claims. (Cl. 229—5.5)

This invention relates to closures for receptacles, and more particularly to covers made of paper or similar fibrous material having a transparent window therein and adapted for use on paper receptacles, and to the method for making such closures.

Such closures heretofore suggested have been subject to the disadvantage of insecure fastening of the transparent pane at the periphery thereof with the consequent possibility of easy dislodgment whereby the contents of the container to which the closure is attached may spill or be contaminated.

Another disadvantage of prior closures of this character relates to the difficulty of rapidly and economically manufacturing same having a pane or window which is securely attached to a peripheral flange.

Methods heretofore proposed for manufacturing receptacle closures of this type have not provided for easy and rapid anchoring of the transparent portion.

One of the desired features of a receptacle closure embodying the invention is that it be of sufficient stiffness to hold the transparent pane locked firmly in position in a superior manner; another is that the closure be readily applied and conveniently removable without damage to the transparent portion; and lastly that it be adapted to rapid and economical production.

An object of the invention is to provide a cover for a receptacle which possesses these advantages.

The invention consists in the novel features, arrangements and combination of parts and method steps embodied, by way of example, in the structure hereinafter described as illustrating a preferred form of the invention.

Further objects, features and advantages of the invention will appear from the following description taken in connection with the accompanying drawing in which:

Fig. 1 is a vertical sectional view taken through a receptacle having thereon a closure embodying the present invention;

Fig. 2 is a plan view of the closure shown in Fig. 1 embodying the present invention;

Fig. 3 is a side elevation of the closure shown in Fig. 2;

Fig. 4 illustrates parts of the novel closure in one of the preliminary stages in the formation thereof; and

Fig. 5 is a sectional view, with parts broken away, illustrating on an enlarged scale a cross-sectional area of a portion of the novel closure, the latter being applied to a receptacle having a beaded upper rim.

Referring to the drawing, the novel closure is indicated in general at **10**, the latter, as shown in Fig. 1, being applied to a receptacle **11** having an outwardly rolled upper edge forming a bead as at **12**.

The closure or lid **10** is preferably of circular conformation when viewed from above, as shown in Fig. 2, and consists in general of a relatively stiff flanged rim indicated generally at **13** and a transparent pane at **14**, the latter being held in a stretched flat condition by the former, as will appear more fully hereinafter.

Referring now to Fig. 5, the flanged rim **13** is constituted by the following: (*a*) a single layer flat annular flange **15** composed of a plurality of plies of paper or the like fibrous sheet material, there being three plies in the form shown indicated at **16**, **17** and **18**; and (*b*) a two layer annular flange indicated generally at **19** depending skirtwise from the periphery of flange **15** and forming a continuation thereof, and including an outer layer **19***a* and an inner layer **19***b*. The latter layer comprises a continuation of and is integral with the former layer, said layers being joined along the lower edges thereof (Fig. 5) at **19***c*.

The transparent member or window **14** is formed of a transparent flexible film, for example of plastic material having an annular flange of the same material which also depends skirtwise from the periphery thereof indicated generally at **20** and formed of two adjacent layers **20***a* and **20***b* joined at **20***c*, the layer **20***b* having been formed by folding inwardly a lower margin of such plastic annular depending flange and adjacent the layer **20***a*. Said two layer flange **20** is interposed between the layers **19***a* and **19***b* and the outer faces of the flange layers **20***a* and **20***b* are secured by a suitable adhesive or by bonding to the inner adjacent faces of the layers **19***a*, **19***b*.

In the form shown the inner flange layer **20***b* is less in width than that of the outer flange layer **20***a*, such layer **20***b* being terminated at a point **21** which is at about the mid-point of the angular extent of an arcuate portion of flange **19** as will be explained below. The outer flange layer **20***a* is secured to the outer layer **19***a* over an area coextensive therewith and commencing approximately at a line **22** which defines (Fig. 5) the upper extremity of flange **19**.

Further, as is well illustrated in Fig. 1, the flat annular flange **15** is parallel with the main body of the transparent pane **14** and overhangs same to form a protective member for the margin thereof. The flange **19** depending skirtwise therefrom may be formed as: (*a*) an upper or bead embracing portion **23** of inwardly concave configuration and of substantially semi-circular cross-section, said portion being adapted for embracing the outer surfaces of the bead **12**; and (*b*) a downwardly and outwardly flaring frusto-conical skirt portion depending from said bead embracing portion as indicated generally at **24**. Said frusto-conical or outwardly flaring skirt portion **24**, together with at least a portion of said bead embracing flange portion **23**, are constituted by said outer layer **19***a* coextensive with the full flange width, including said inwardly concave portion and said flaring skirt and also by said inner layer **19***b* above described. The latter may be tapered in cross-section as at **19***b'* (Fig. 5), if desired. Said inner layer is disposed closely adjacent the inner face of said outer layer and extends from the lower edge of such outer layer upwardly and inwardly, as viewed in Fig. 5, and into the recess formed by said inner concave portion **23** to a point, if desired, which is about one-half of the arcuate extent of the latter, as at **21**. Positioning the inner layer **19***b* so as to terminate at **21** (Fig. 5) provides a closure of the general type disclosed in James D. Reifsnyder U. S. Patent No. 2,233,489, issued March 4, 1941, for "Receptacle Closure," which type of closure is adapted for repeated use. Obviously the upper edge of inner layer **19***b* may terminate at a point lower than **21** so as to provide a closure of the general type disclosed in James D. Reifsnyder U. S. Patent No. 2,493,086, issued January 3, 1950, for "Snap-On-Cover," which type of closure is a locking type intended for a single use.

In forming the novel receptacle closure or container lid having a transparent pane therein a novel method is employed which consists in first forming a cylindrical collar as at **25** (Fig. 4) of preferably convolutely wound plies of paper or the like sheet material. Preferably

three plies are employed corresponding to plies **16**, **17** and **18** in Fig. 5, and the plies are intimately secured or bonded together by suitable adhesive means. Thereafter the window pane is formed of flexible transparent plastic material with a flange of the same material depending from the periphery thereof, the pane being indicated at **14** and the flange at **14***a*. The collar **25** has upper and lower edges indicated at **25***a* and **25***b* respectively and the pane flange **14***a* has upper and lower edges indicated at **14***b* and **14***c* respectively The width of the flange **14***a* (dimension between **14***b* and **14***c*) is preferably less than the height of the collar by a preselected distance indicated at **26**. The flange **14***a* is secured by suitable adhesive to the inner face of said collar **25** with the lower edges thereof adjacent one another, that is, with the lower edge **14***c* positioned along the lower edge **25***b*. Preferably the multi-plies of collar **25** are intimately secured together by thermoplastic adhesive to facilitate heat sealing in the manner well understood in the art. This may be conveniently accomplished by coating the strip of paper to be wound in the convolute form of the collar with a thermoplastic coating on one side. By disposing this coated face of the paper inwardly as the collar is wound the inner surface of the finished collar is thus provided with an adhesive coating and to this surface the flange **14***a* of the pane may be readily bonded by heat and pressure in the well known manner. The pane proper **14** is spaced downwardly from the upper edge **25***a*, as shown in Fig. 4. The annular portion of the collar **25** between the upper edge **25***a* and the pane proper **14** is termed the "overhang member" and is measured by said distance **26**. The overhang member is folded through about 90° to a position adjacent to said pane **14** to form a flat overhang flange indicated at **15** in Fig. 5. The remainder of the collar below line **19***c* (collar skirt margin) is folded inwardly to form said double layer depending flange indicated generally at **19**, each layer consisting of a portion of the collar and of the pane flange secured thereto, such portions of the pane flange being contiguous. In the embodiment of the invention shown in Fig. 5, the flange **19** is suitably formed to provide the bead embracing portion **23** and the outwardly flaring frusto-conical skirt portion **24**.

We have found that in order to permit the working of the collar **25** to provide the configuration shown in Fig. 5, the collar should be multi-ply (preferably three ply) convolutely wound with the superimposed plies cemented or bonded together substantially throughout the width of the collar. Also the pane flange must be cemented or bonded to the inner face of the collar for a substantial distance thereover. While it is preferable to carry the pane flange to the lower edge **25***b* of the collar **25**, it is not essential to carry it to the full extent.

Having thus described our invention with particularity in reference to a preferred form thereof, it will be obvious to those skilled in the art after understanding our invention that further changes and modifications may be made therein without departing from the spirit and scope of our invention as defined by the claims appended hereto.

What we claim as new and desire to be secured by Letters Patent of the United States is:

1. The method for forming a container lid having a window pane therein which consists in: forming a cylindrical collar of a plurality of plies of paper or the like sheet material intimately secured together, said collar having an upper and a lower edge; forming a window pane of flexible transparent material having a flange of the same material depending from the periphery thereof, said flange having an upper and lower edge, the width of such flange being less than the height of said collar by a preselected distance; securing said flange to the inner face of said collar with the lower edges thereof substantially together, the pane being spaced from such upper edge by such preselected distance, the portion of such collar between said pane and upper edge comprising an overhang portion; folding said overhang portion to a position contiguous with said pane to form a flat annular flange; and folding inwardly a portion of the remainder of the collar contiguous said pane flange to form a double layer collar each layer consisting of a portion of the collar and the pane flange secured thereto, such portions of the pane flange being contiguous.

2. A container lid comprising: a disk-shaped window pane of resilient transparent material having an annular depending flange on the periphery thereof; a band composed of a plurality of plies of paper or the like sheet material intimately secured together, said band being substantially equal in width to the peripheral flange of said pane, said band encircling said flange and being secured thereto by adhesive over a substantial area thereof, said band and flange together forming a layer, the latter at about the mid-point thereof being folded inwardly upon itself to form two layers, and a flat annular flange formed integral with and of the same material as said band and overhanging the margin of said pane.

3. A container lid comprising: a disk-shaped pane of resilient transparent material having an annular depending flange of preselected width on the periphery thereof; and a band composed of a plurality of plies of paper or the like sheet material, said band encircling said pane flange, the inner face of said band being secured by adhesive over a substantial area thereof to the outer face of said pane flange and folded double to provide two adjacent layers of said band and pane flange of substantially equal width.

4. A container lid having a window pane therein comprising: a top flange of annular flat configuration; a first annular depending flange integral with said top flange, said flanges comprising a plurality of convolute plies of paper or the like sheet material intimately secured together; and a window pane of flexible transparent material having an integral depending second annular flange, said first flange being folded inwardly to form two separate flange layers and said second flange being intimately secured between said two flange layers.

5. A container lid having a window pane therein comprising: a flat annular top flange; a depending flange integral with said top flange; said depending flange comprising two multi-ply convolutely wound layers of paper or the like sheet material, said layers being integrally connected along one edge thereof and formed by folding one against the other from a common layer; a pane of resilient transparent material having a marginal portion coextensive with and intimately secured between such layers.

6. A windowed container lid comprising a flat annular top flange and a depending flange; a pane of resilient transparent material secured to the latter flange; said depending flange comprising two multi-ply layers of paper or the like sheet material with the margin of said pane interposed therebetween, such layers including an outer layer shaped in the form of a bead embracing inner concave member of substantially semi-circular cross-section and a substantially frusto-conical outwardly flaring skirt member secured thereto; and an inner layer disposed complementarily to said skirt member and a portion of said bead embracing member, said layers being integrally connected at the outer edge of said skirt member, there being a portion of the margin of said pane secured to said layers.

7. A paper closure for receptacles of the type having a beaded rim substantially circular in cross-section including in combination: an annular flange of paper or the like sheet material comprising an overhang portion, an inner concave portion substantially semi-circular in cross-section immediately adjacent said overhang portion, and a skirt portion which flares outwardly in frusto-conical conformation away from said concave portion, said annular flange having a basic thickness constituted by a preselected number of plies of said sheet material

intimately secured together, such preselected number comprising a first thickness and being coextensive with the full flange width including said concave and skirt portions and a second thickness disposed inwardly thereof and closely adjacent the inner face of said first thickness and extending from the outermost edge of said skirt portion into said inner concave portion, and a resilient transparent member completing said closure and held by said annular flange along the margin thereof between said thicknesses, such margin being interposed between and secured to the adjacent faces of said thicknesses.

8. The method of forming a container lid having a window pane therein which consists of forming a cylindrical collar of a convolutely wound strip of paper or the like sheet material to provide a plurality of plies intimately secured together, said collar having an upper edge and a lower edge, forming a window pane of relatively thin transparent material having a flange of the same material depending from the periphery thereof, the width of said flange being less than the height of said collar, securing said flange intimately to the inner face of said collar with the pane spaced from one edge of said collar a preselected distance defining an overhang portion and with the flange extending a substantial distance toward the other end of said collar, folding said

overhang portion of said collar to a position contiguous with the outer face of said pane to form a flat flange, and folding inwardly a portion of the remainder of said collar to thereby form a double layer collar with said pane flange interposed between said layers and intimately secured to an adjacent face of one of said layer, said layers being unattached one from the other throughout the extent of said double layer collar.

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