March 28, 1939. G. A. MOORE 2,152,322

CONTAINER

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FIG.1.

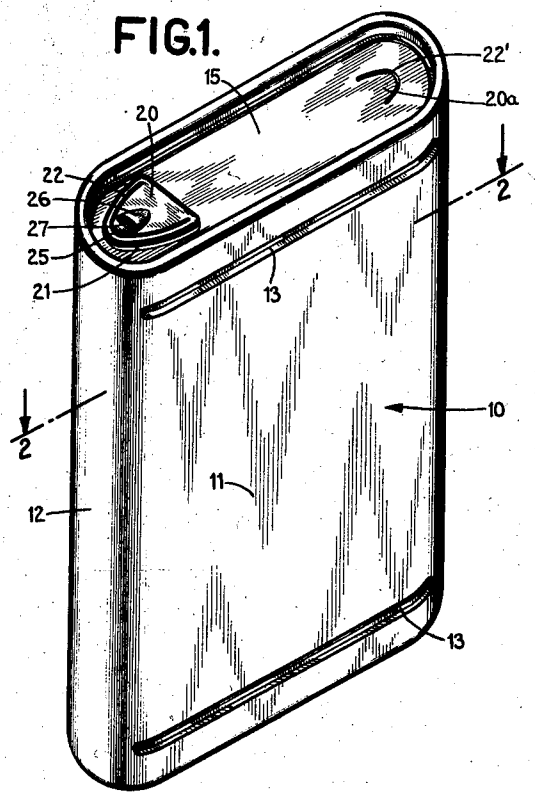
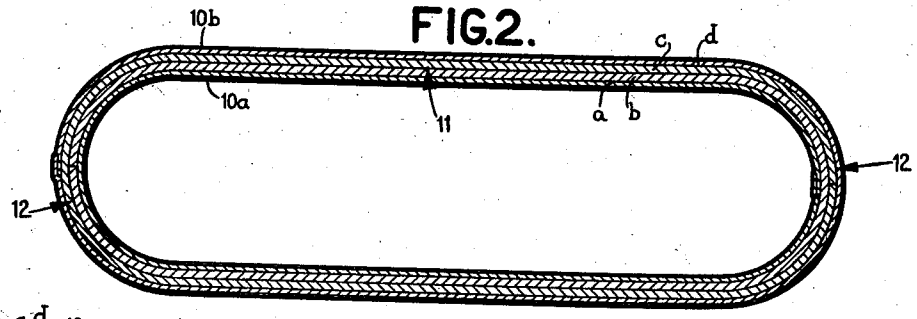


FIG.2.



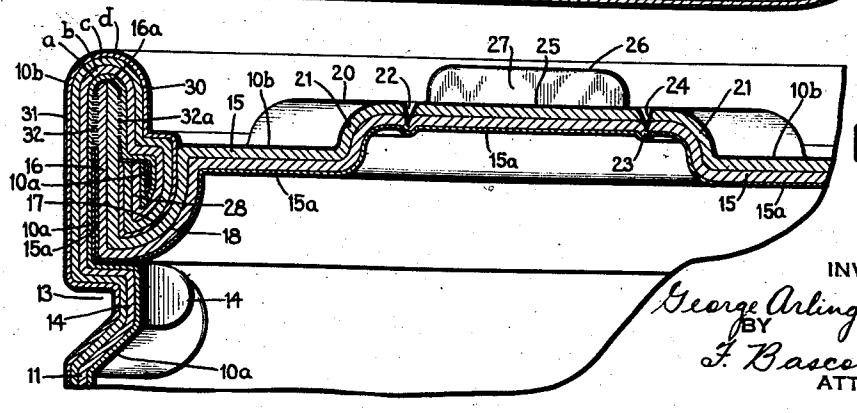


FIG.3.

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CONTAINER

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FIG.4.

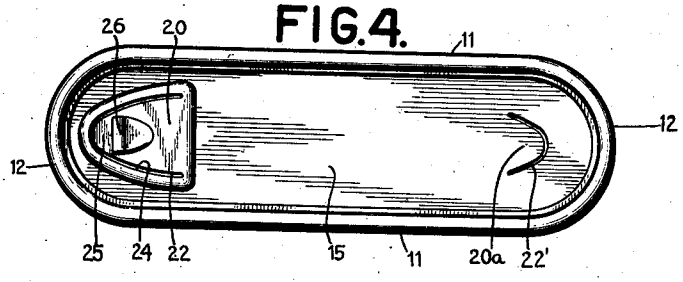


FIG.5.

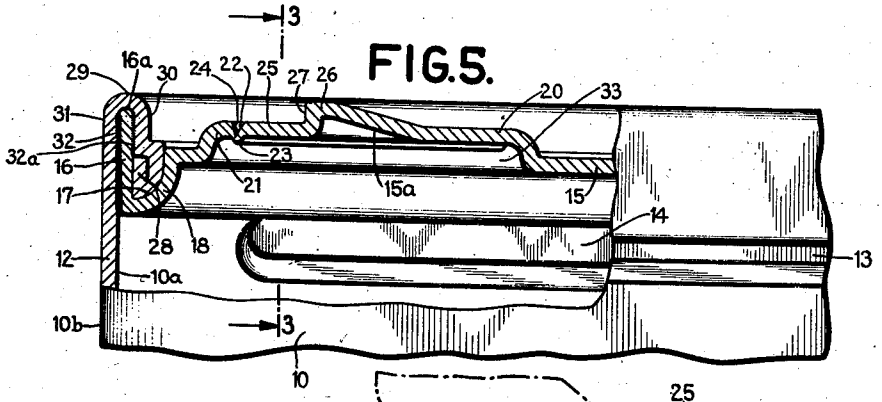


FIG.7.

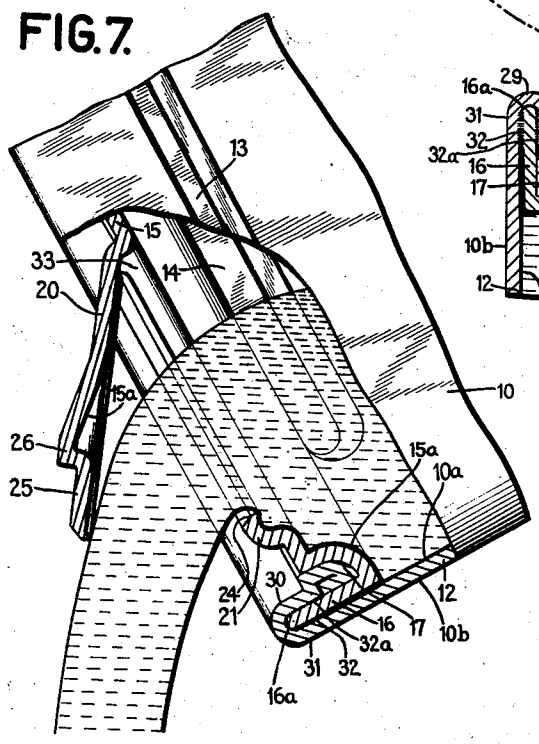


FIG.6.

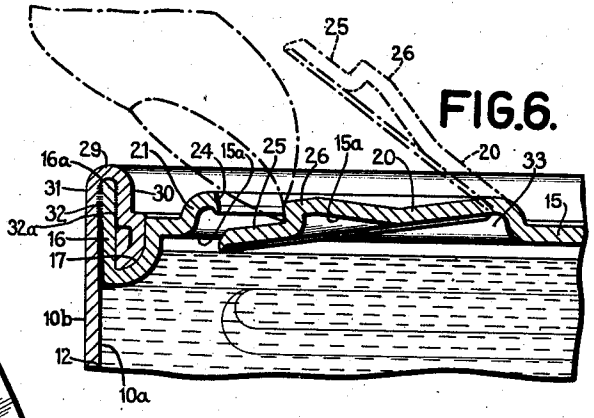
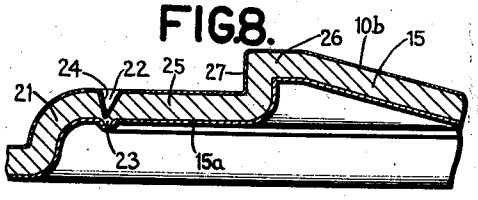


FIG8.



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UNITED STATES PATENT OFFICE

2,152,322

CONTAINER

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Application January 30, 1936, Serial No. 61,476

12 Claims. (Cl. 229—7)

This invention relates to containers and more particularly to containers fabricated from webs or sheets and blanks comprising fibrous materials, such as paper, fiberboard, or the like.

One of the objects of the present invention is to provide a novel fabricated container comprising fibrous materials which is adapted to retain liquids, such as oils, without loss by leakage or absorption.

Another object of the invention is to provide a novel container which may be employed for transporting and storing liquids as well as other commodities and which may be rapidly and inexpensively manufactured.

Still another object is to provide a novel container having a hatch which may be readily opened without the use of instrumentalities for the purpose of dispensing the contents thereof.

A further object is to provide a fibrous container having a novel closure which is so constructed that an opening may be made therein by finger pressure, said opening having an arcuate lip surrounding the same for directing the flow of liquid from the container.

The above and further objects and novel features of the invention will more fully appear from the following detail description taken in connection with the accompanying drawings. It is to be expressly understood, however, that the drawings are for the purpose of illustration only and are not designed as a definition of the limits of the invention, reference being had for this latter purpose to the appended claims.

In the drawings, wherein like reference characters refer to like parts throughout the several views,

Fig. 1 is an isometric view of one form of container embodying the present invention;

Fig. 2 is a section on an enlarged scale taken on line 2—2 of Fig. 1;

Fig. 3 is an enlarged detail view, partly in section and with parts broken away, the section being taken on line 3—3 of Fig. 5;

Fig. 4 is a top plan view of the container of Fig. 1;

Fig. 5 is a partial side elevation of said container on an enlarged scale and partly in section;

Fig. 6 is a similar view showing the hatch in various positions after the same has been broken;

Fig. 7 is a similar view showing the hatch in open position with a liquid being dispensed therefrom; and,

Fig. 8 is a detail sectional view on an enlarged scale of a portion of the top closure.

One form of the novel container comprehended by the present invention is illustrated in the drawings by way of example as being oblong in horizontal cross-section for the purpose of facilitating the packing of the same for transportation or storage. The container shown comprises a body section 10 having straight parallel side walls 11 and arcuate walls 12 connecting said side walls. Body 10 is preferably constituted by a laminated structure comprising four laminae *a*, *b*, *c* and *d* of fibrous sheet material in the form of blanks joined to one another by suitable adhesives such as plasticized animal glue, each of said blanks having a length substantially equal to the periphery of said body. The inner and outer laminae *a* and *d*, as shown, are only about one-half as thick as the two central laminae *b* and *c*, and the former have the ends thereof scarfed and lapped to form a smooth inner and outer surface, whereas the latter are butt jointed, alternate joints being at opposite sides of the body to insure the imperviousness thereof. It will be understood that the thickness of the body laminations has been exaggerated in the drawings in the interest of clearness, the actual thickness of the material employed for laminae *a* and *b* in one form of container of substantially the dimensions illustrated in Fig. 2 being approximately .005 inch and .010 inch, respectively.

In the formation of body 10, blanks *a* to *d*, inclusive, are successively wrapped about a collapsible mandrel having the desired shape and size and pressed into intimate engagement with each other whereby the interposed films of glue or other adhesive are pressed into the interstices of the material, substantially welding the blanks together so that the laminated character of the completed body is scarcely visible to the naked eye. The ends of blanks *a* and *d* are preferably joined by a thermoplastic adhesive adapted to be activated by a heated iron which may be pressed against the joints.

While body 10 is supported by the above mentioned collapsible mandrel, a pair of grooves 13, having complementary inwardly extending ribs 14, are formed in each of the side walls 11 of the body, one adjacent the top and one adjacent the bottom of said body. Grooves 13 may be formed by external pressure members having suitably shaped beads thereon adapted to extend into similarly shaped grooves in the side walls of said collapsible mandrel. The ribs formed on the body walls constitute means for giving additional rigidity and strength to the container and for preventing side walls 11 from unduly bowing

inwardly or outwardly either from the natural tendencies of the material to return, by virtue of internal stresses, to its original position, or from the pressure exerted thereon by the contents of the container. Grooves 13 constitute means for positioning the end closures of the container and means whereby body 10 may be supported during the insertion of said end closures and the formation of the sealing joints between said body and closures, as will hereinafter appear.

In order to improve the moisture and oil-proof qualities of the container of the present invention and to render the same suitable for confining a liquid such as oil and for containing food stuffs such as peanut butter, for example, the inner surface of body 10 is preferably coated with a thin film 10*a* of a thermoplastic, nitrocellulose lacquer which is impervious to moisture and oils and free from odor which would contaminate food products. The lacquer employed is also adapted to be activated by heat or a solvent or both in order that the same may be utilized as a bonding medium in forming the impervious seam between body 10 and its end closures, as will appear hereafter. A dry sheet of cellulose material or similar impervious material which may be sealed by heat or solvent or both may be used, if desired, in lieu of lacquer film 10*a*.

The top closure 15 for body 10 in the form illustrated is constituted by a novel, suitably shaped blank comprising one or more sheets of fibrous material laminated with a thin dry sheet of cellulose acetate 15*a* which is adapted to be rendered plastic by the application of heat. Acetate sheet 15*a* is secured to the inner surface of the closure blank by means of a suitable adhesive such as a cellulose acetate lacquer which is not affected by heat, said sheet serving to render the closure impervious to oils, moisture, etc., and to assist in rendering permanent the deformations impressed in the blank to form closure 15. In drawn or deformed articles of the character of closure 15 comprising fibrous materials, the common tendency of warpage, distortion and other stresses is to return the material to its original shape. This tendency is counteracted in closure 15 by the acetate lamina 15*a* which is rendered plastic by the heat of the forming dies, thereby avoiding the creation of similar stresses therein during the drawing and deforming operations to which blank 15, 15*a* is subjected. Upon removal of closure 15 from the forming dies, sheet 15*a* cools and sets quickly, thus becoming effective to hold the fiber lamina under stress and render the contours and deformations thereof permanent. When using automatic machinery, the drawn article 15 is preferably delivered into a holding die for cooling, said die constituting means for transferring the article.

Closure member 15 is preferably formed from the above described laminated blank in accordance with the method disclosed in my Reissue Patent No. 19,504 for Flanged reinforced paper article and process of making same, issued March 19, 1935, whereby the marginal portion 16 of said blank is drawn into flanged relation with the central part thereof. A peripheral groove or channel 17 is also preferably formed in closure 15, the walls of said groove being constituted by the lower portion of flange 16 and a curved wall portion 18 which joins the lower edge of said flange and the central portion of the closure. Said groove serves as a recess in which the raw edges of flange 16 and body 10 may be hidden and locked in place, as will more fully appear hereafter, and arcuate wall or ledge 18 is effective to impart lateral rigidity and longitudinal flexibility to closure 15. Groove 17 should be made sufficiently wide to avoid excessive strains on and weakening of the fibers and material of the blank during the deforming operations.

Novel means are provided, preferably as a part of closure or cover 15, whereby an opening for dispensing the contents of the container may be readily made therein by finger pressure without the necessity for the use of additional pieces of material serving as tabs, etc., said means being such as will not destroy the moisture-proof and air-proof qualities of the container. Said novel means in the preferred embodiment are also so constituted that the opening formed when the seal or hatch is broken will be surrounded by a flow directing lip which is effective to limit the spread of the liquid stream flowing from the container and to prevent dripping when the flow is stopped. In the form shown, such means comprise a raised area 20 in closure 15, preferably of a triangular-like shape, the base line thereof in the plane of said closure being substantially perpendicular to side walls 11, and the apex thereof being adjacent one of the arcuate walls 12 (Fig. 4). That portion of closure 15 which joins area 20 and the remainder of said closure is in the form of a short, outwardly convex arc 21, the upper edge of which converges toward the center of said area and constitutes, as will hereinafter appear, a flow directing lip for directing the flow of liquid or other contents from the container.

Along the two sides of area 20 which converge at the apex thereof a triangular plow-shaped furrow 22 is cut, said furrow preferably extending approximately three-quarters of the way through blank 15. In order that acetate sheet 15*a* on the inner surface of said blank will not be damaged or the moisture and air proof qualities of the container destroyed, the pressure exerted by the knife or edge employed in cutting furrow 22 is relieved by means of a groove in the pressure resisting die which engages the face of blank 15 opposite said knife or cutting edge. A bead or ridge 23 is thus formed on the inner surface of cover 15 and the impermeability thereof maintained, while a line of weakness is established which enables a user to break an opening of predetermined size and shape in the container by finger pressure without the use of a knife or other implement. Furthermore, furrow 22 being cut by a plow-shaped knife, the fibers of the blank are cleanly sheared thereby, and crystallization of the uncut fibers which would result from excessive compression thereof is prevented. The plow-shaped knife cuts the furrow so that wall 24 thereof approaches the vertical, as more clearly seen in Fig. 5, thus insuring a clean break along the line of cleavage at the apex of furrow 22 when pressure is applied to area 20 and eliminating any likelihood of flaking of the material and consequent contamination of the contents thereby. If desired, a similarly shaped furrow 22' may also be cut in the opposite end of cover 15 to provide a hatch 20*a* for readily making an air vent to facilitate pouring of the contents.

It will be noted that the hatch seal 23 may be broken to open the container by the application of an inwardly directed pressure on area 20, thus forcing hatch or flap 25 inside of said container. If it is desired to pivot flap 25 outwardly after the material is sheared along the line of furrow

22 or to break the hatch seal by pulling outwardly on said flap, a lug 26 constituted by the material of blank 15 may be formed adjacent the apex of flap 25 of area 20. In the embodiment illustrated, lug 26 has a triangularly shaped outline, the base thereof being constituted by a substantially vertical wall portion 27 while the surface of the lug inclines downwardly from the upper edge of said vertical wall to the plane of area 20 (Fig. 5). By engaging wall 27 with one's fingernail, flap or hatch 25 may be readily pivoted either from sealed position, or from the full-line position of Fig. 3, to the dotted line position of Fig. 3. When flap 25 is in said dotted line position, the contents of the container may be readily poured through the opening formed by the removal of said flap.

After the formation of closure 15 in the manner above described, the same is secured in the open end of body 10 by a novel seam formation between said body and the flange of said closure whereby the container is imperviously sealed and the raw edge of closure flange 16 is hermetically enclosed to insure against permeation of the closure blank by moisture. The closure is inserted into body 10 until the base rim thereof, constituted by the lower wall of groove 17, rests upon ribs 14, as best seen in Fig. 3. While cover 15 is thus supported and positioned by said ribs, the upper edge of body 10 is first flowed or curled inwardly on a small radius to initiate the curl 28 and then on a larger radius to direct said curl into groove 17, thus overlapping the marginal portion of the body and flange 16 so as to interlock the same. Thereafter, a downwardly directed pressure is exerted on the upper edge 29 of the multi-ply seam thus formed to press curl 28 into intimate contact with the walls of groove 17, and oppositely directed lateral pressures are exerted on surfaces 30 and 31 with simultaneous application of heat to press the plies of the seam into close contact with one another. A solvent which may be applied to the inner surface of body 10 or to flange 16 prior to the flowing operation and/or heat conducted through the plies of the same from surrounding die members are effective to activate lacquer film 10*a* at points 32 and 32*a* and to render an annular area of acetate sheet 15*a* plastic, said area being indicated in section at 32. The simultaneous exertion of pressure on opposite sides of the seam is effective to distribute the activated adhesive and plastic acetate material between the plies and press the same into the interstices thereof. The seam laminations constituted by flange 16 and the wall of body 10 are thereby substantially welded to one another at both the inner and outer surfaces of said flange, thus hermetically sealing the container and providing a sealed enclosure for edge 16*a* of flange 16 to protect the same against contact by moisture, either from within or without the container.

Fibrous materials are subject to penetration by moisture, and this is particularly true at points where the fibers thereof have been severed or sheared, such as in the formation of grooves 22 and 22' in the present container. Moisture coming in contact with the fibers under excessively humid conditions is effective to permeate the fibrous material to such an extent as to weaken the same. A coating or film 10*b* (Figs. 3 and 8) of moisture proof lacquer or other suitable substance is accordingly preferably applied, such as by spraying, to the outer surfaces of container 10 and the top and bottom end closures, said coating covering the walls of grooves 22 and 22', as best seen in Fig. 8. Film 10*b*, besides rendering the outer surface of the container moisture resistant, also serves to give a high gloss and pleasing appearance to the container. If desired, the material of the body and closures may be impregnated with a water proof substance in lieu of film 10*b*.

The bottom closure, although not shown in the drawings, is preferably of the same construction as top closure 15, except that no hatch and raised area 20 nor vent 22' are provided therein. Said bottom closure may be inserted and secured in the lower end of body 10 in the same manner as above described for top closure 15.

To open a container embodying the present invention, pressure may be applied against lug 26, which thus serves as a locating deformation defining the proper point for application of pressure to open the hatch. The hatch seal is broken along the line of cut or furrow 22 when said pressure is applied, and flap 25 moved to the full line position of Fig. 6 into the void space 33 beneath raised area 20. Space 33, being void, limits the squeezing or squirting of any of the liquid contents out of the container when the seal is broken. Flap 25 may now be lifted to the dotted line position of Fig. 6 by engaging wall 27 of lug 26 with the fingernail, or the same may be pressed inwardly of the container to clear the opening for dispensing the contents of the container. It will be noted that the arcuate wall portion 21 remains intact after the hatch seal has been broken and flap 25 removed, thereby forming a flow directing lip, the curved contour of which gives the fluid passing thereover an initial direction of flow toward the center of the pouring opening. Excessive spread of the fluid stream is thus prevented, and said stream is so directed that there will be no interference to flow by the seam joining body 10 and closure 15. To increase the freedom of flow, vent 20*a* may be opened by application of finger pressure thereto.

There is thus provided a novel impervious container fabricated from fibrous and acetate materials and adapted for transporting liquids, oils, or greases, as well as other substances, said novel container being so constructed that an opening having a flow directing lip surrounding the same may be readily made therein by finger pressure. The container may be made of light, inexpensive materials and manufactured in large quantities and at low cost. The oblong shape of the container facilitates handling of the same in the larger sizes. The arrangement of the laps in the side walls of the body not only insures an impervious container, but the added thickness, or undue bulk, in prior containers having overlapped joints is avoided, thereby greatly facilitating the operation of the fabricating tools. Although only one embodiment of the invention has been illustrated and described, it is to be expressly understood that the same is not limited thereto, but that various changes may be made in the shape and size of the container and in the particular type of seam illustrated without departing from the spirit and scope of the invention. For a definition of the limits of the invention, reference will be had primarily to the appended claims.

What is claimed is:

1. A container comprising a body and a closure member therefor, the latter comprising a blank including fibrous material having a raised area and a furrow adjacent the outer edge of said

area formed by cutting some of the fibers of said blank.

2. In a container, a closure member comprising a blank having a raised portion with outwardly curved arcuate walls connecting the same with the remainder of the blank and a furrow cut into said portion and constituting a line of cleavage for making an opening in the closure.

3. In a container, a closure member comprising a blank of substantially uniform thickness throughout, said blank having a raised portion, the side walls of the latter being arcuate in section, and a furrow constituting a line of cleavage cut in said raised portion adjacent said side walls.

4. In a container, a closure member comprising a blank of substantially uniform thickness throughout, said blank having a raised portion, the side walls of the latter being arcuate in section, a furrow constituting a line of cleavage cut in said raised portion adjacent said side walls, and a second raised portion on the first whereby the latter may be manipulated after the material of the blank is severed along said line of cleavage.

5. A container comprising a body and a closure member therefor, the latter comprising a blank including fibrous material having a raised area, a furrow adjacent the outer edge of said area to form a hatch, said furrow being formed by cutting some of the fibers of said blank, and a raised portion in said area constituting a lug for manipulating the hatch.

6. In a container, a closure member comprising a blank having two vertically spaced portions of substantially equal thickness, an arcuate wall connecting said portions, and a furrow cut in the outermost of said portions adjacent the upper edge of said connecting wall.

7. In a container, a closure member comprising a blank having two vertically spaced portions, an arcuate wall portion connecting the same, and a furrow constituting a line of cleavage cut in the outermost of said portions adjacent the periphery thereof to form a hatch.

8. In a container, a closure member comprising a blank, two vertically spaced portions, an arcuate wall portion connecting the same, a furrow constituting a line of cleavage cut in the outermost of said portions adjacent the periphery thereof to form a hatch, and a raised area on said outermost portion constituting a tab for manipulating said hatch.

9. In a container, a closure member comprising a blank having two parallel, spaced portions, an arcuate wall connecting the same, and a line of weakness in the outermost of said portions extending along all but one side thereof adjacent said connecting wall.

10. In a container, a closure constituted by a blank comprising a raised area, a furrow cut in said area to form a hatch, and a flow directing lip surrounding the opening adapted to be made in said closure by the hatch.

11. In a container, a closure member comprising a blank having a raised portion adjacent one end thereof with outwardly curved arcuate walls connecting the same with the remainder of the blank, a furrow cut into said portion and constituting a line of cleavage for making an opening in the closure, and a furrow cut into the opposite end of said blank and constituting a line of cleavage for making a second opening in the closure.

12. In a container, a body, and an end closure therefor constituted by a deformed blank comprising fibrous materials and having a furrow cut therein to form the outline of a hatch and a deformation constituted by an outwardly drawn raised portion in said hatch whereby the latter may be manipulated.

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