ABSTRACT OF THE DISCLOSURE

A foldable container and blank therefor are provided in which the container has a reenforced bottom delimited by a plurality of upright side walls. The bottom is formed by panels foldably connected to the lower edges of a pair of side walls and arranged in interlocking and interstratifying relation.

BACKGROUND OF THE INVENTION

Heretofore various foldable containers of this general type have been provided; however, because of certain design characteristics, they have been beset with one or more serious shortcomings. For example, (a) setting up of the container has been an awkward and oftentimes frustrating operation; or (b) there was no positive interlocking of the bottom-forming panels and thus stability of the set-up container was impaired; or (c) the blank for the container was of an unusual peripheral configuration resulting in an inordinate amount of waste of the blank-forming material.

SUMMARY OF THE INVENTION

Thus, it is an object of this invention to provide a foldable container and blank therefor which overcome the shortcomings associated with prior structures.

It is a further object of this invention to provide a foldable container which is possessed of high load-carrying capacity without requiring thicker and more costly material.

It is a still further object of this invention to provide a container having both a reenforced bottom and side walls without increasing the overall size of the blank and thus effect more efficient utilization of the blank-forming material.

It is a still further object of this invention to provide a reenforced container which may be readily set up and knocked down for reuse.

Further and additional objects will appear from the description, accompanying drawings and appended claims.

In accordance with one embodiment of this invention a foldable container is provided which comprises a plurality of foldably connected upright side walls, and a first bottom-forming panel foldably connected to the lower edge of one of the side walls and extending angularly therewith. A second bottom-forming panel is also provided which is foldably connected to and extends angularly from the lower edge of a second side wall. The first bottom-forming panel has formed therein an elongated slot which extends substantially the length of one dimension of the panel. The second bottom-forming panel, in turn, is provided with an elongated foldline whereby said panel comprises an inner segment and an outer segment. The inner segment is in face-to-face contact with one surface of the portion of the first panel disposed to one side of the elongated slot, and the outer segment extends through the slot and is in face-to-face contact with the opposite surface of the portion of the first panel disposed on the other side of the slot.

DESCRIPTION

For a more complete understanding of the invention, reference should be made to the drawings wherein:

FIG. 1 is a plan view of one form of the improved blank;
FIG. 2 is a perspective view of the blank of FIG. 1 in a partially set-up condition;
FIG. 3 is similar to FIG. 2 but showing the blank in a further stage of setup;
FIG. 4 is similar to FIG. 3 but showing one of the bottom-forming sections having a portion thereof being inserted through the slot formed in the other bottom-forming section;
FIG. 5 is an enlarged fragmentary sectional view taken along line 5—5 of FIG. 3;
FIG. 6 is an enlarged sectional view of the fully set-up container; the sectional plane being parallel to the upright end walls; and
FIG. 7 is a fragmentary perspective view of the container formed from the blank of FIG. 1 and in position for filling but having portions of the end and side walls cut away so as to expose the interior of the container.

Referring now to the drawings and more particularly to FIG. 7, a foldable container 10 is shown which is adapted to be readily set up or collapsed when desired for reuse. The illustrated container 10 is formed from a blank 11 (see FIG. 1) of suitable sheet material such as, for example, paperboard or double-faced corrugated board. The material employed will depend upon the intended use of the container. While the illustrated container is in the form of an open top receptacle, the invention hereinafter disclosed is not to be limited thereto. The invention is described in relation to the illustrated embodiment only for purposes of facilitating understanding thereof.

Container 10 comprises foldably connected outer side and end walls 12a—b and 13a—b, respectively, which cooperate with one another to delimit a bottom wall 14. The bottom wall is formed from sections 15 and 16 which are arranged in interlocking and interstratifying relation in a manner to be described more fully hereinafter. In addition, the container 10, as illustrated, includes inner reenforcing end panels 17a and b which are disposed in face-to-face contact with the interior surfaces of outer end walls 13a—b, respectively.

The configuration of the various panels forming container 10 and the foldable interconnection thereof can be readily determined upon viewing the blank 11 shown in FIG. 1. Walls 12a—b and 13a—b are separated from one another by a plurality of elongated parallel foldlines 18. A manufacturer's glue flap 20 is connected by foldline 21 to the outer edge of either side wall 12b or end wall 13a. Connected by foldline 22 to the lower edge of side walls 12a is bottom-forming wall section 15. In a like manner the other bottom-forming section 16 is connected to the lower edge of side wall 12b by a foldline 23.

Projecting laterally from opposite side edges of bottom-forming section 15 and connected thereto by foldlines 24 are the reenforcing end panels 17a and b. The extent to which panel 17a or b projects laterally from foldline 24 (indicated in FIG. 1 by x) will depend upon the height h of the end wall 13a or b. It is preferable that the dimensions x and h be the same.

Section 15 is provided with an elongated slot 25 which extends crosswise the full width thereof—that is to say it spans the distance between foldlines 24. The slot 25 in the illustrated embodiment is centrally disposed and forms segments 15a and b. If desired, however, the slot 25 may be positioned closer or farther away from foldline 22, or even in certain instances, extend diagonally or angularly across the section 15. Reenforcing panels 17a and b are separated from end walls 13a and b, respectively, by cuts 26.

Bottom-forming section 16, as seen in FIG. 1, is provided with an elongated foldline 27 which separates
section 16 into segments 16a and b. Foldline 27 is spaced substantially the same distance from foldline 23 as the elongated axis of slot 25 is from the outer edge 15c of section 15 when the container is set up. A finger notch 28 is formed in the other edge of segment 16a of bottom-forming section 16 as so to facilitate collapsing of the container 10, when desired.

The edges 17c of both reinforcing panels 17a and b, adjacent the outer edges 17a thereof, may be curved, if desired, but not shown, and the outer edge 17d of each panel foreshortened accordingly a small amount to compensate for such curving so that folding of section 15 to the horizontal position and disposition of the panels 17a and b to their face-to-face contact with the respective end panels 13a and b, as shown in FIG. 5, are facilitated. Handholes, if shown, may be formed in end panels 13a and b and reenforcing panels 17a and b, if desired, which would register with one another when the container is set up, and thus facilitate carrying of the loaded container. The utilization of such handholes and their relative disposition is disclosed in my earlier U.S. Patent No. 2,418,963.

In setting up the container from blank 11, a suitable adhesive is first applied to the underside of the glue flap 20 and then panel 12b and flap 20 are folded as a unit about the foldline 18, disposed between panels 12b and 13b, so as to overlie panel 13b and a portion of panel 12a. Panel 13a is then folded about the right-hand foldline 18 whereupon a marginal portion of the panel will overlap and bond onto the adhesively coated surface of glue flap 20. In lieu of adhesive bonding, staples, tape or the like may be utilized.

The initial set-up step, aforesaid, is normally performed at the time the blank is produced and then the partially formed container is stored or shipped in bulk to the customer where the following additional set-up steps are followed by the customer.

The next step in setting up the container is to square up the side and end walls in the manner as shown in FIG. 2 so that the bottom-forming sections are in inverted position. When the panel 17a and b are then folded inwardly into underlying relation with section 15, see FIG. 2, before the section 15 is folded downwardly relative to side wall 12a until it assumes a substantially horizontal position (see FIG. 3). Because of the inherent fire-back of the blank material to folding, the folded panels 17a and b will seek to resume their unfolded positions and thus automatically move into face-to-face contact with the interior surfaces of end walls 13a and b, see FIG. 5.

After the reinforcing panels are in proper relative position, the segments 16a and b are folded relative to one another so that the segment 16a is inserted downwardly through slot 25. If by chance the reinforcing panels 17a and b are not in their proper vertical position, the inserted segment 16a will cause the same to happen. Once the segment 16a has been fully inserted through slot 25, fireback of the material will automatically cause the segment 16a to assume a substantially flat position as seen in FIG. 6. When the segment 16a has assumed the position shown in FIG. 6, the sections 15 and 16 are in interlocking interstratifying relation—that is to say segment 15a overlies segment 16a and segment 15b underlies segment 16b. Once the sections 15 and 16 have assumed, or substantially assumed, the positions shown in FIG. 6, the container 10 is inverted to the position shown in FIG. 7 wherein it is ready for filling. The contents of the container will serve to retain the sections 15 and 16 in interlocking and interstratifying relation. Both sections 15 and 16 are preferably of such dimension that they span the distances between the side walls 12a and b and the end walls 13a and b. The notched edge of segment 16a will normally be in frictional engagement with side wall 12a when the container is fully set up.

As aforesaid, the shape and size of the container and the corresponding blank configuration may be varied from that shown without departing from the scope of the invention. For example, top closure flaps may be foldably connected to the upper edge of the blank shown in FIG. 1 whereby the top of the container may be effectively closed subsequent to filling thereof.

Thus, it will be seen that a foldable, reusable container has been provided which is capable of being readily set up or collapsed when desired. Furthermore, the container is provided with a reenforced bottom formed of sections arranged in interlocking, interstratifying relation. The reenforced construction of the container is effected without complicating the configuration of the blank or producing an inordinate amount of material waste during formation of the blank.

1. A container formed from a blank of foldably single thickness sheet material, comprising a plurality of foldably interconnected side walls, one pair of opposed side walls being of double thickness, a first panel foldably connected to the lower edge of one side wall and extending angularly therefrom, and a second panel foldably connected to the lower edge of a second side wall and extending angularly therefrom; said first and second panels being in interlocking and interstratifying relation with respect to one another and forming a container bottom of multi-thickness throughout; one thickness of each double thickness side wall being foldably connected to one of said bottom-forming panels.

2. The container of claim 1 wherein said first and second panels are foldably connected to oppositely disposed side walls.

3. The container of claim 1 wherein the panel to which one thickness of each double thickness side wall is connected is provided with an elongated slot forming first and second portions, said slot extending from one side wall to another, and said other panel is provided with an elongated foldline forming an inner segment and an outer segment; said inner segment subtending the panel first portion and said outer segment inserted through said elongated slot and overlying the panel second portion.

4. The container of claim 3 wherein the elongated slot is formed in said first panel and is disposed substantially parallel to the axis of fold of said first panel and extends from one double thickness side wall to the other double thickness side wall, and said first and second panels are foldably connected to oppositely disposed single thickness side walls.

5. The container of claim 4 wherein said first and second panels are foldably connected to oppositely disposed side walls and said first panel substantially spans the distance between said oppositely disposed side walls.

6. The container of claim 4 wherein the height of both thicknesses of said double thickness side walls are the same.

7. The container of claim 1 wherein the container bottom is delimited by alternately arranged narrow and wide side walls and said first and second panels are foldably connected to said wide side walls.

8. A blank formed from a sheet of single thickness foldable material for use in forming a container, said blank comprising a plurality of side wall panels arranged in side-by-side relation and separated from one another by a set of first foldlines, a first bottom panel connected by a second foldline to a side of a first side wall panel, a second bottom panel connected by a third foldline to
a corresponding side of a second side wall panel, said first and second side walls being separated from one another by a third side wall panel, and a pair of reinforcing side wall panels foldably connected to opposite sides of said first bottom panel; said first bottom panel being provided with an elongated slot, and said second bottom panel being provided with an elongated fourth foldline wherein said second bottom panel includes an inner segment and an outer segment, said outer segment having a configuration capable of being inserted through said elongated slot when said blank is set up to form said container.

9. The blank of claim 8 wherein said elongated slot spans the distance between said pair of reinforcing side wall panels.

10. The blank of claim 9 wherein said elongated slot is disposed in spaced substantially parallel relation with respect to said second foldline.

11. The blank of claim 8 wherein the configurations of said reinforcing panels and said third side wall are substantially the same.

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