United States Patent

[11] 3,580,473

[72] Inventor **Lester D. Gill**
302 North Road, Kinnelon, N.J. 07405

[21] Appl. No. **797,111**
[22] Filed **Feb. 6, 1969**
[45] Patented **May 25, 1971**

[54] **PAPER BOARD CONTAINER WITH PLATFORM STYLE BOTTOM**
16 Claims, 17 Drawing Figs.

[52] **U.S. Cl.** **229/21,** 229/1.5
[51] **Int. Cl.** **B65d 3/08**
[50] **Field of Search** D9/219, 242, 243; 229/21, 27, 24, 25, 8, 1.5, 1.5D

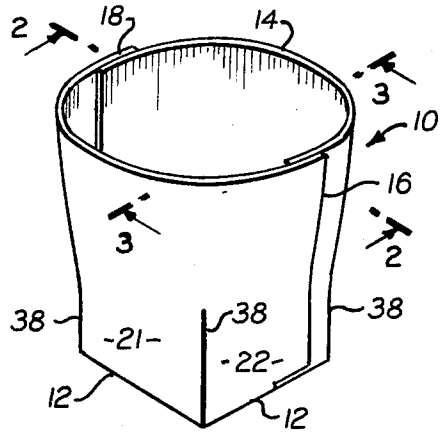
[56] **References Cited**

UNITED STATES PATENTS

1,295,418	2/1919	Bohlman	229/21
1,877,213	9/1932	Willauer	229/16AUX
2,168,186	8/1939	Adamson	229/21
2,385,898	10/1945	Waters	229/1.5(B)X
2,925,208	2/1960	Wood	229/1.5(D)
3,106,330	10/1963	Rausing	229/37X
3,198,416	8/1965	Hickin et al.	229/14(BL)

Primary Examiner—Davis T. Moorhead
Attorney—Sandoe, Hopgood and Calimafde

ABSTRACT: A merchandising container of paperboard or nonmetallic sheet material made from a blank that provides a platform bottom of polygonal shape and sidewalls that change to a top edge that is circular, oval, or at least more circular than the bottom. Panels fold back on themselves to hold the bottom at a level above the bottom of the sidewalls. The preferred shape of the bottom is square and this makes a particularly effective blank that can be supplied flat and set up on a filling machine at a user's factory. A laminate blank can provide a moisture and vaporproof container.



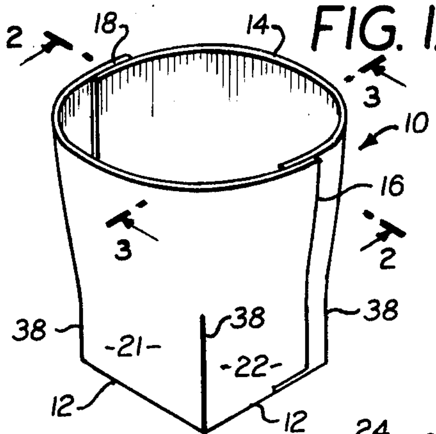


FIG. 1.

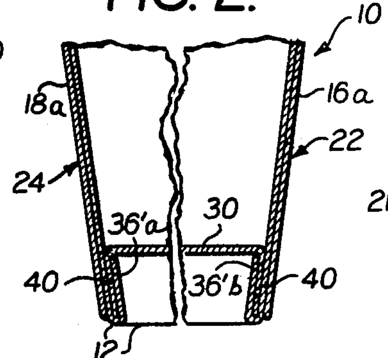


FIG. 2.

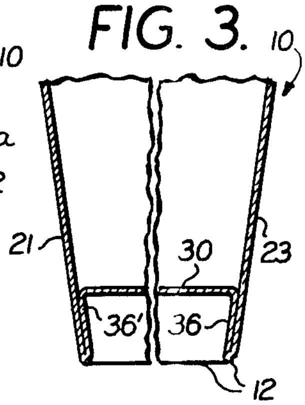


FIG. 3.

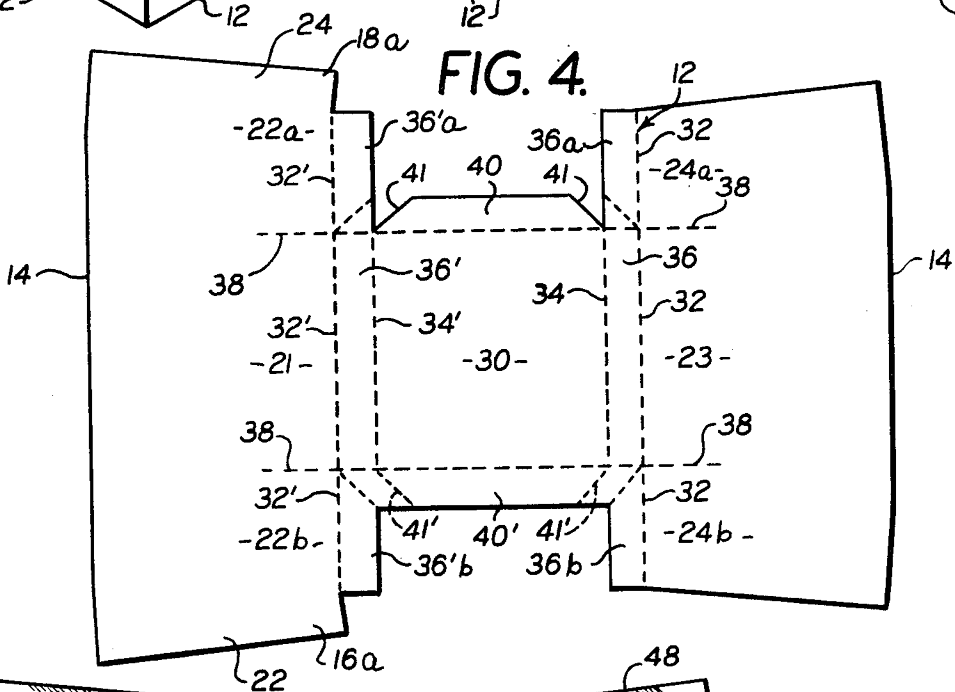


FIG. 4.

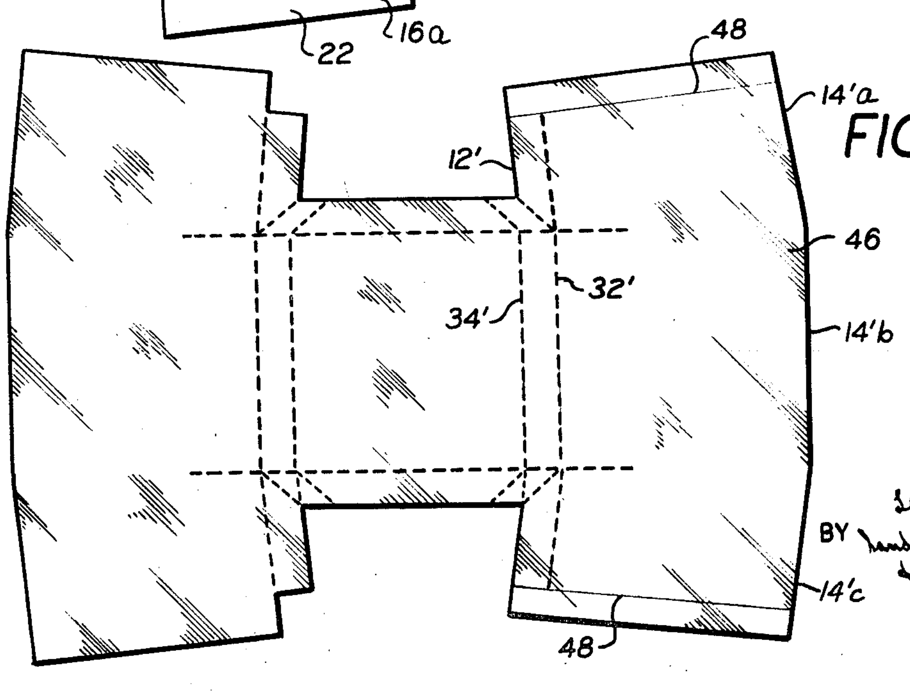


FIG. 5.

INVENTOR
Lester D. Gill.
BY

ATTORNEYS.

FIG. 6.

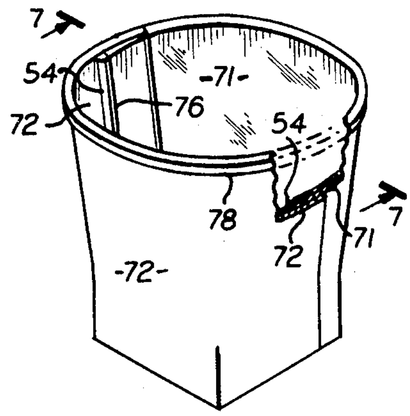


FIG. 7.

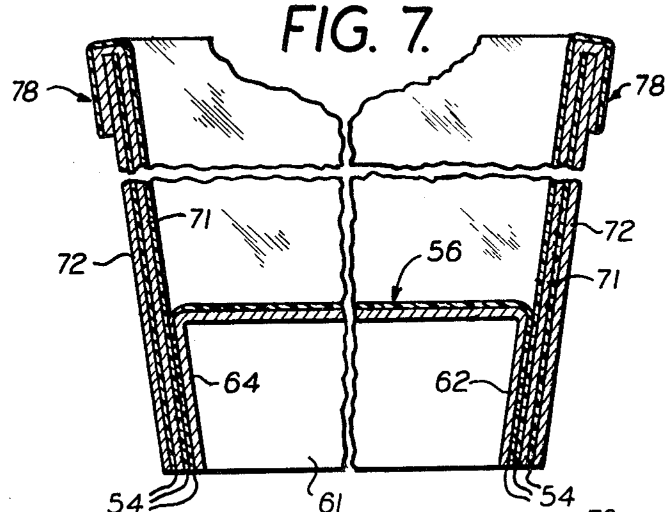


FIG. 8.

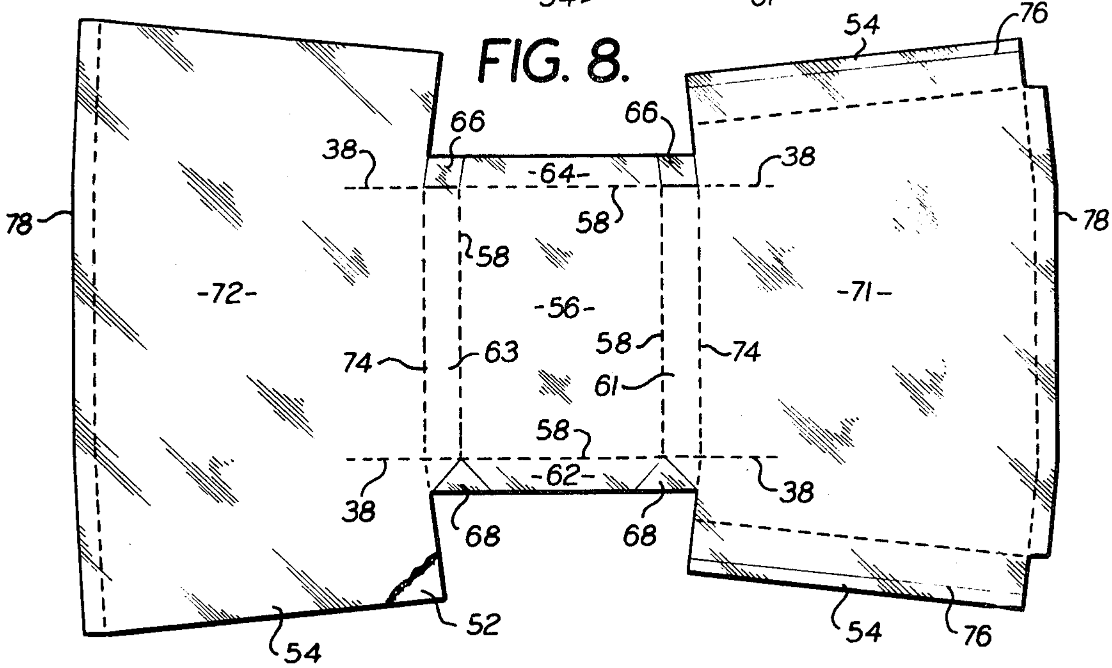


FIG. 9.

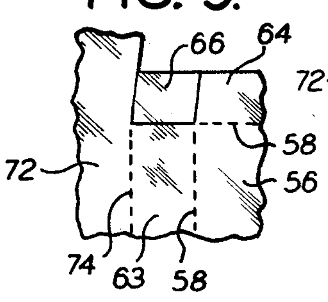


FIG. 10.

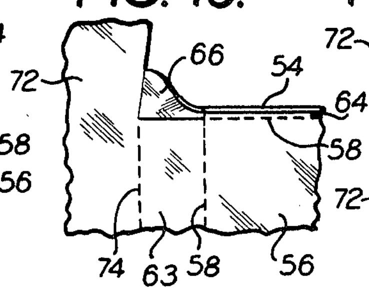


FIG. 11.

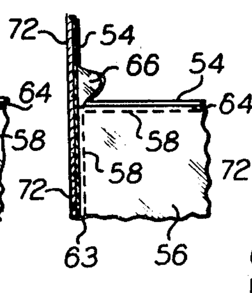
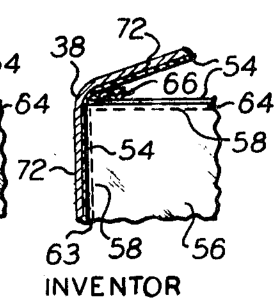


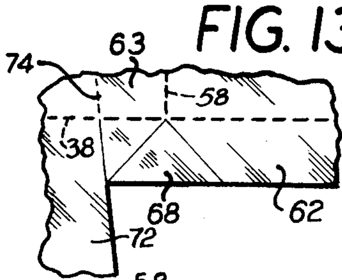
FIG. 12.



INVENTOR
Lester D. Gill

BY Sandoe, Hopgood & Calimafde.
ATTORNEYS.

FIG. 13.



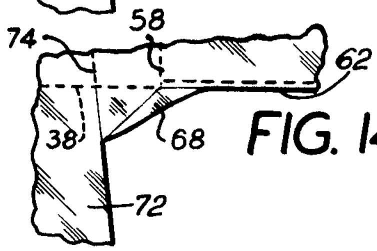


FIG. 14.

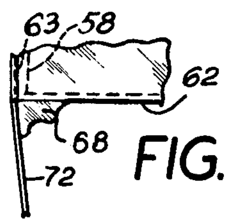


FIG. 15.

FIG. 16.

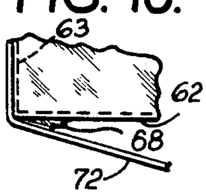
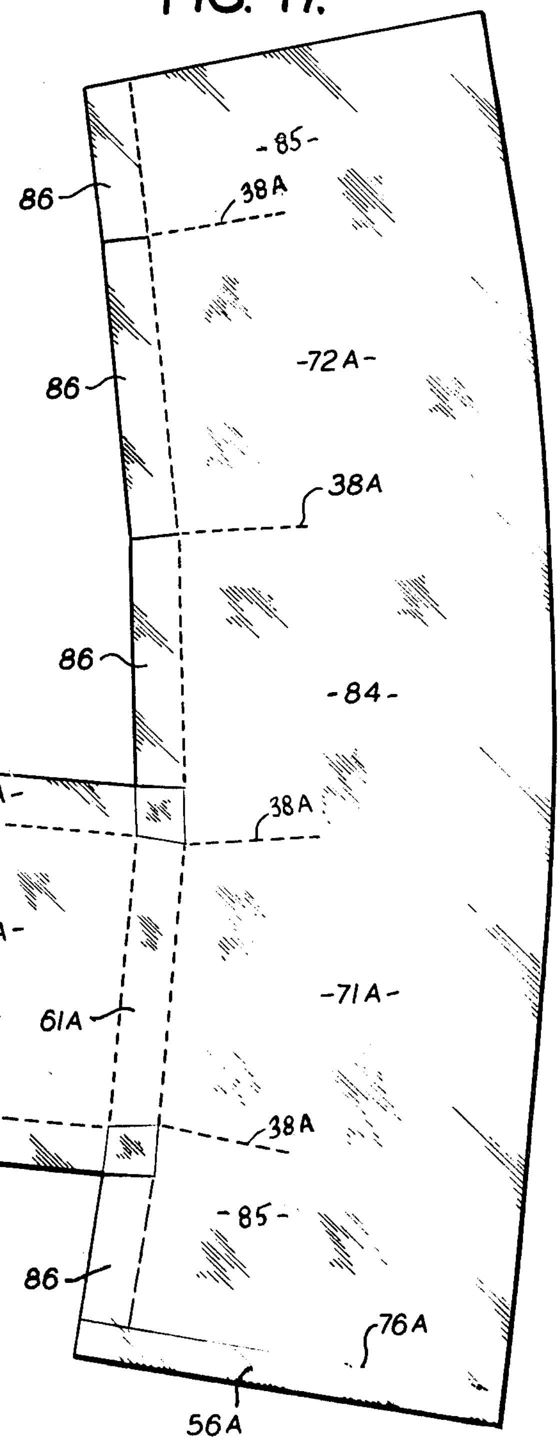


FIG. 17.



INVENTOR
Lester D. Gill

BY Sandoe, Hopgood & Calimafde
ATTORNEYS.

PAPER BOARD CONTAINER WITH PLATFORM STYLE BOTTOM

RELATED APPLICATIONS

This invention is a further development of the polygon-bottom, round-top merchandise containers disclosed in my U.S. Pat. No. 3,357,322, issued Dec. 12, 1967, and my pending application, Ser. No. 689,669, filed Dec. 11, 1967, now U.S. Pat. No. 3,498,251 issued Mar. 3, 1970.

SUMMARY OF THE INVENTION

Round merchandising containers, with or without a taper for nesting during shipment and storage, have advantages of strength and in handling, but containers of such shapes cannot be set up easily from flat blanks at the point of use, and they are factory-made and shipped in nested relation where possible. This invention provides a container that has a polygon bottom, preferably square, which can be set up by simple steps from a one-piece blank and which has a circular upper portion with the advantages of the round containers.

If desired, the bottom can be rectangular, other than square, and the upper part can be oval; or the upper part may be a polygon of many more sides than the bottom. For example: a hexagonal bottom can change to a twelve-sided top which is near enough to a circle to receive a round closure since the material of the container will bend to the extent necessary. In describing the upper end of the container as approaching a circle, it should be understood that this means the upper end is of a shape that comes nearer to a circle than does the lower end.

In its simplest form, the blank of this invention has its sidewalls made of two portions, each of which is connected with an opposite side of the polygon bottom. For this construction, the bottom must be a polygon having an even number of sides and the container has two side seams on its opposite sides when in setup condition. The blanks can be made with only one panel for the sidewalls and only one side seam, and can have an odd number of sides, but this may make the blank more complicated and its setting-up more difficult.

Another feature of the invention is that it lends itself to the construction using a laminate blank with extruded or coated material either resistant or proof against liquids or gases of vaporproof containers, and paper containers that do not wick at raw, cut edges when storing syrups and other liquids having no filler characteristics. This feature utilizes a laminate on the inside of the container that extends beyond the edge or edges that form the inside of any lap seam of the sidewall, or any coating or extrusion extending beyond the edges or flowing over the edges. Wax is one example.

Other objects, features and advantages of the invention will appear or be pointed out as the description proceeds.

BRIEF DESCRIPTION OF THE DRAWING

In the drawing, forming a part hereof, in which like reference characters indicate corresponding parts in all the views:

FIG. 1 is an isometric view showing a container made in accordance with this invention;

FIGS. 2 and 3 are enlarged, fragmentary, sectional views on the lines 2–2 and 3–3, respectively, of FIG. 1;

FIG. 4 is a view of the paperboard blank from which the containers of FIGS. 1—3 are made;

FIG. 5 is a view similar to FIG. 4 but showing a modified construction of the blank, and showing a blank having a vaporproof plastic laminate, extrusion or coating flowing over the edges, for obtaining a vaporproof package;

FIG. 6 is an isometric view, partly broken away, showing a modified container made in accordance with this invention;

FIG. 7 is an enlarged, fragmentary sectional view taken on the line 7–7 of FIG. 6;

FIG. 8 is a plan view of a blank from which the container shown in FIGS. 6 and 7 is made;

FIGS. 9—12 are fragmentary detail views illustrating the way in which the blank is folded to form a corner at the bottom of the container;

FIGS. 13—16 are fragmentary detail views similar to FIGS. 9—12 but showing the way in which the blank is folded at a corner having a different construction from that of FIGS. 9—12; and

FIG. 17 is a view similar to FIGS. 4, 5 and 8 but showing a modified blank construction.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. 1 shows a container 10 having square bottom edge 12 and a round top 14. This container has two lap seams 16 and 18 at its opposite sides.

The container has four sides 21, 22, 23 and 24. The sides 21 and 23 extend downwardly to the bottom edge 12, as shown in FIG. 3, and then fold back on themselves and extend upwardly to connect with a bottom 30 which is above the bottom edge 12.

The construction which makes this platform bottom 30 possible is best shown in FIG. 4. The bottom 30 is connected with the sidewall 23 with score lines 32 and 34. The bend at the score line 32 forms the bottom edge 12 and the bend at the score line 34 forms the juncture between the bottom 30 and the part of the sidewall 23 which is folded back on itself to form a panel 36 which constitutes the part of the blank between the score lines 32 and 34. The connection to the wall 21 to the other side of the bottom 30 is of similar construction with the corresponding parts indicated by the same reference characters with a prime appended.

There are score lines 38 extending from each corner of the bottom 30 for a portion and only a portion of the height of the sidewalls, curving at the top, if desired, to relieve any strain that develops.

The sidewalls 22 and 24 are each formed by two originally separate panels which are joined to one another to make the seams 16 and 18, respectively.

In the blank shown in FIG. 4, the parts of the blank which form the wall 22 are indicated by the reference characters 22*a* and 22*b*. The parts that form the outside laps of the seams 16 and 18 are indicated by the reference characters 18*a* and 16*a*. The parts of the wall 22 which fold back from the bottom edge 12 are indicated by the reference characters 36′*a* and 36′*b*. These panels 36′*a* and 36′*b* fold upward at score lines 32′ which are continuations of the same score line which extends along the bottom portion of the sidewall 21.

The construction of the wall 24 is similar to that of the wall 22, already described, the panels of the wall 24 on opposite sides of the seam being indicated by the reference characters 24*a* and 24*b*, and the panels which fold upwardly at the lower ends of the sidewall 24 being indicated by the reference characters 36*a* and 36*b*.

The bottom 30 has small panels 40 and 40′ which preferably tuck in between the sides 22 and 24 and the folded-back panels 36′*a* and 36′*b*, 36*a* and 36*b* in the manner illustrated in FIG. 2. This provides a strong platform bottom for the container. The panel 40 differs from the panel 40′ in that it has cut edges beyond which some of the material of the blank is cut away, as compared with the panel 40′ which has score lines 41′ in place of the cut edges. The panel 40 thereby eliminates an extra thickness of sheet material in the folded corners. Either construction can be used on both sides of the bottom, as in FIG. 5. Ordinarily, the same construction is used at both sides of the bottom.

The panels at the lower ends of the sidewalls, which fold back on the sidewalls and the other panels which tuck in between the folded-back panels, are all secured together in the setup container by adhesive. The term "adhesive" is used herein in a broad sense to indicate glue or similar material applied to the surfaces to be bonded and to indicate also coatings on the sheet material of the blank, including coatings which can be activated by heat and/or pressure when the container is set up.

The material used for the blank shown in FIG. 4 is preferably paperboard or equivalent material since this provides an inexpensive merchandising container of sufficient strength. Other nonmetallic sheet material can be used, including flexible plastic material and combinations of paperboard and plastic. For constructions that do not require double folds of the paper, corrugated paperboard can be used. The expression "sheet material" is used herein to designate stiffly flexible material, whether corrugated or not.

FIG. 5 shows a container blank which is similar to that shown in FIG. 4 except that the edges, which form the top of the container, indicated by the reference characters 14'*a*, 14'*b* and 14'*c* in FIG. 5, are in angular relation above the different sides of the container. This makes the top of the container more uniform in height and a curve can be substituted for the broken top lines 14'*a*, 14'*b* and 14'*c*, if desired. By using a curve, the height of the container can be made uniform, but the broken lines of the blanks shown in FIGS. 4 and 5 make the top edge sufficiently uniform to receive a cover which laps the top edge for a short distance and thus completely compensates any minor differences in the height of the sidewall.

The blank shown in FIG. 5 also has a bottom edge 12' with portions of it at an angle to a score line 32' to facilitate the change in shape of the container from square to round as the sidewalls extend upwardly. The line 32' can also be a curve, if desired.

Another difference in the blank shown in FIG. 5 is that the entire blank is covered on its inside surface with a coating of vaporproof plastic 46. This plastic 46 extends somewhat beyond edges 48 of the blank. These edges 48 are the edges which are on the inside of the side seams of the completed container and without the plastic 46, extending beyond the edges 48, there would be raw, cut edges of the paperboard exposed to the contents of the container. With certain types of liquid, such raw edges permit the liquid to wick into the paperboard and this wicking continues indefinitely while the liquid is in storage in the container. Some contents which are packaged in paperboard containers, such as ice cream, do not wick because solids in the ice cream quickly fill up interstices in raw, cut edge and seal the edge. The portions of the plastic which extend beyond the edges 48 can be folded around the edges and bonded to the back of the blank, if desired, before setting up the container.

The portion of the plastic coating 46 which extends beyond the edges 48 is bonded to the other plastic which it overlaps in the setup container and thus completely seals the raw, cut edges. By having the coating 46 vaporproof, the container can also be used for packaging products which require a gastight package. For less severe service, coatings such as wax can be used and the cut edges of the board can be coated with the wax, which flows over the cut edges.

FIGS. 6—8 show a construction with a simpler platform bottom construction, The blank, shown in FIG. 8, is preferably of one-piece construction and made of a somewhat porous sheet material 52 covered by plastic sheet material 54 which is impervious to liquid and preferably to vapor also. There is a bottom panel 56 defined by score lines 58; and there are panels 61, 62, 63 and 64 beyond the score lines 58. The bottom panels 56 and the adjacent panels 61—64 can be of symmetrical construction, but in FIG. 8 they are different on different sides of the bottom to illustrate different constructions. In practice the same construction is ordinarily used on both sides of the bottom.

At both ends of the panel 64 there are areas 66 of the plastic film 54 which span cutout potions of the sheet material 52. These areas 66 have none of the sheet material 52 beneath them. At both ends of the panel 62, there are areas 68 of plastic which have none of the sheet material 52 beneath them. The purpose of these areas 66 and 68 is to facilitate folding of the blank at bottom corners of the container by reducing the thickness caused by overlapping of the sheet material 52 and the plastic of the areas 66 and 68 fills in and seals the corners in the setup container to prevent sifting of fine powder and leakage of liquid.

The sides of the container shown in FIGS. 6 and 7 are formed by panels 71 and 72 which join the panels 61 and 63, respectively, along score lines 74. Edges 76 of the panel 71 have the plastic 54 extend beyond them so as to seal these edges 76 against wicking when the container is set up with edges 76 on the inside of lap seams of the container, as shown in FIG. 6. There are upper edge panels 78 along the top part of each of the side panels 71 and 72; and these upper edge panels 78 are folded over to form a reinforced top for the sides of the container and for holding a cover on the container more securely. This folded top edge construction can be used on the blanks of FIGS. 4 and 5, if desired. The upper edge of the container is oval when the bottom panel 56 is longer than it is wide, as shown in FIG. 8; and is round when the bottom panel 56 is square. The top edge can be made octagonal, or given other polygonal shapes by using appropriate score lines extending upward in the side panels 71 and 72. When an upper edge of continuous curvature is desired, score lines 38 extend from the corners of the bottom for only a part of the height of the panels 71 and 72.

FIGS. 9—12 show the way in which the panels are bent to form the platform bottom of the box, and the way in which the areas 66 of the unsupported plastic fold in to seal the corners. In FIG. 9 the parts are in the positions shown in FIG. 8. The first operation is the folding down of the panel 64 (away from the observer in FIG. 10). The thickness of the plastic on the panel 64 is shown in full lines because the plastic is transparent. Translucent or opaque plastic can be used.

The next step is to bend the panel 63 downward at the score line 58, and to bend the side panel 72 upward on the score line 74. This brings the plastic on the face of the panel 63 into contact with the plastic on the confronting area of the side panel 72 and these faces are preferably bonded to one another by heat and/or pressure sealing. Parts of the side panel 72 that extend above the plane of the bottom panel 56 are shown in section in FIG. 11 and also in FIG. 12.

FIG. 12 shows the final step in which the side panel 72 is bent along the score line 38 to fold the lower end of the side panel 72 into contact with the confronting face of the panel 64. The plastic coating 66 is clamped between the coatings on the contacting faces of the panel 64 and the lower part of the panel 72. For some types of containers, soft coatings of wax, instead of extending films, can be used to prevent leakage.

FIGS. 13—16 show the way in which the areas 68 of the plastic sheet material fold into the corner of the container as the blank is set up. In FIG. 13 the panels are in the relation shown in FIG. 8 but on a large scale. The first operation is the folding down of the panel 62 (away from the observer in FIG. 14). The thickness of the plastic on the panel 62 is shown in full lines because the plastic is transparent.

The next step is to bend the panel 63 downward at the score line 58, and to bend the side panel 72 upward at the score line 74, as show in FIG. 15. This brings the plastic on the face of the panel 63 into contact with the plastic on the confronting area of the side panel 72 and these faces are preferably bonded to one another by heat and/or pressure sealing. Parts of the side panel 72 that extend above the plane of the bottom panel 56 are shown in section in FIG. 15 and also in FIG. 16.

FIG. 16 shows the final step in which the side panel 72 is bent along the score line 38 to fold the lower end of the side panel 72 into contact with the outside face of the panel 62. Plastic coating 68 is clamped between the coatings on the contacting faces of the panel 62 and the lower part of the panel 72. As with the other blanks, some types of containers can be made with soft coatings, such as wax, instead of extending films to prevent leakage.

FIG. 17 shows a modification of the blank shown in FIG. 8 constructed for making a container with only one side seam. Corresponding modifications can be made in the blanks shown in FIGS. 4 and 5 in order to have a container with only one seam.

Parts of the blank shown in FIG. 17 which correspond to parts of FIG. 8, are designated by the same reference charac-

ters with a letter "A" appended. There is a bottom 56A connected with side panel 71A by an intermediate panel 61A which bends downward to form the platform effect, as in the other blanks. The side panel has an edge 76A and plastic film 56A extending beyond the edge 76A at the lower end of FIG. 17.

Beyond the score line 38A at the upper limit of the panel 71A, there is a continuous side panel 84 which forms a full width side of the container without any seam. This takes the place of the side formed by the two half panels at the upper end of the blank shown in FIG. 8 above the score lines 38 at opposite sides of the bottom 56. Referring again to FIG. 17, a side panel 72A, that forms the side of the container opposite the side 71A, is connected to the side panel 84 along a score line 38A. The side panel 72A extends beyond its upper score line 38A to an upper edge 76A to form an upper half panel 85 which lays a complementary lower half panel 85, of the blank shown in FIG. 7, to form the fourth and seamed side of the container.

The bottom 56A has other panels 62A, 63A and 64A that bend downward, like the panel 61A, to form the platform bottom. Beyond the ends of the panel 61A, all of the panels that form sides of the container have bottom panels 86 which fold back (upward in the setup container) and the panels 62A, 63A, and 64A fit into the folds so formed to provide a strong bottom construction. This is similar to the way in which the panels 40 and 41 of FIG. 2 and 4 fit into folds at the bottom of the sidewalls of the container. If desired, some or all of the panels 86 can be omitted and the panels 62A, 63A and 64A sealed directly on coated lower portions of panels 84, 72A and 85, respectively.

It will be understood that the panel 56A and its intermediate panel 61A do not have to be connected with the panel 71A but can be connected with one of the other side panels, for example the panel 72A or the panel 84. The bottom panel 56A can be connected with one of the panels which forms the seamed side of the container, but this makes it more difficult to set up the container.

The preferred embodiments of the invention have been illustrated and described, and the invention is described in the appended claims.

I claim:

1. A merchandising container made of a sheet material blank with a bottom panel of polygonal shape having corners where sides of the polygon meet one another, the blank including side panels connecting with one another along score lines at which the blank is bent at the corners of the polygonal bottom to form a sidewall, the sidewall changing from the polygonal shape of the bottom at its lower end to a shape more nearly approaching a circle at its upper end, the bottom being of one-piece construction with at least one side panel and the side panel folding back on itself to locate the bottom at an elevation above the lower edge of the sidewall to provide a platform bottom for the container, the blank having low panels that extend between the level of the bottom panel and the lower edge of the sidewall around all sides of the polygonal bottom panel, at least some of the low panels being longer than the length of an adjacent side of the polygonal bottom panel so that a low panel extends continuously around every corner of the polygon constituting the perimeter of the bottom panel.

2. The merchandising container described in claim 1 characterized by the bottom of the container being square and the top edge of the sidewall being substantially parallel, with a plane defined by the bottom where said bottom joins the sidewalls.

3. The merchandising container described in claim 1 characterized by two sides of the bottom being connected with the sidewall by one-piece paperboard constructions in which a panel from each of the two sides extends downward from the bottom and then folds back on itself and extends upward to form the part of the sidewall on the side of the container above the side of the bottom to which the sidewall connects by said one-piece construction, and the sidewall of the container being secured to the other sides of the bottom by downwardly extending edge portions of the other sides of the bottom bonded to confronting edge portions of the sidewall, at least one of said edge portions being bent back on itself to provide a fold into which the other edge portion extends.

4. The merchandising container described in claim 3 characterized by the sidewall of the container, other than those panels which are connected to sides of the bottom by the one-piece construction, being extensions of the portions of the sidewalls that are connected to the bottom by the one-piece construction, and said extensions being of one-piece construction with the portions of the sidewalls from which they extend.

5. The merchandising container described in claim 3, characterized by each of the downwardly extending edge portions of the sides of the bottom for bonding to a confronting edge portion of the sidewalls being a single panel, and the lower edge portions of each alternate sidewall being bent inward and upward on itself to form the fold into which one of the single panels of the bottom extends.

6. The merchandising container described in claim 1 characterized by the container being constructed from a one-piece blank and having the sidewall joined to the bottom along at least one edge of the bottom with a narrow connecting panel that extends downward from the bottom to a score line where the sheet material bends back at 180° to connect the narrow connecting panel with the sidewall along a double thickness construction below the level of the bottom of the container.

7. The merchandising container described in claim 6, characterized by the sidewall having at least one lap seam above a side of the container bottom other than that along which the sidewall has a one-piece connection with the bottom, and the entire inner surface of the container, including the exposed edge of the sidewall on the inside of the lap seam being covered with an impervious layer of material that prevents contents of the container from permeating the sheet material of which the container is constructed.

8. A merchandising container blank constructed of sheet material and including a bottom panel of polygonal shape, a connecting panel extending along at least one side of the bottom panel, said connecting panel extending also beyond the end of said side of the bottom panel, and adapted to be bent downward to produce a platform bottom, said connecting panel being of low height, panels of similar low height along all of the other sides of the bottom panel, a sidewall portion of the blank connected with the side of said connecting panel opposite the connection of the connecting panel with the bottom panel and laterally extending beyond the ends of said connecting panel, the sidewall portion having score lines in its lower part corresponding to angles of the polygonal shape of the bottom panel, but the sidewall portion at its upper part being constructed and arranged to make the upper edge of the sidewall portion form a top edge of the container that more nearly approaches a circle than does the polygon bottom.

9. A merchandising container blank constructed of sheet material and including a bottom panel of polygonal shape, a connecting panel extending along at least one side of the bottom panel, and adapted to be bend downward to produce a platform bottom, said connecting panel being of low height, panels of similar low height along all of the other sides of the bottom panel, a sidewall portion of the blank connected with the side of said connecting panel opposite the connection of the connecting panel with the bottom panel and laterally extending beyond the ends of said connecting panel, the sidewall portion having score lines in its lower part corresponding to angles of the polygonal shape of the bottom panel, but the sidewall portion at its upper part being constructed and arranged to make the upper edge of the sidewall portion form a top edge of the container that more nearly approaches a circle than does the polygon bottom, and characterized by the sidewall portion beyond the ends of the panel that connect it with the bottom panel having other panels along its bottom

edge portion of substantially the same height as the panel that connects it with the bottom panel, said other panels being parts of the connecting panel that extend beyond the end of said side of the bottom panel, score lines along which said other panels fold back at 180° to form folds for receiving some of the panels of similar low height along the other sides of the bottom panel to form a platform construction for the bottom when the blank is set up.

10. the merchandising container blank described in claim 9 characterized by the sidewall portion being in two parts, each of which is connected with an opposite side of the bottom panel, the bottom edge portions of the sidewall portions beyond the sides of the bottom to which they are connected converging toward one another as they extend beyond the sides of the bottom to which they are connected.

11. The merchandising container blank described in claim 8, characterized by the sidewall portion of the blank having edges in position to lap one another when the blank is set up as a container, a coating covering all of one side of the blank that forms the inside of the container when the blank is set up, said plastic extending beyond the edge of the blank that is located on the inside of the lap seam for protecting the edge of the blank along the seam from contact with the contents of the container.

12. The merchandising container blank described in claim 10 characterized by the bottom being substantially square, and said panels of similar low height along the sides of the square, between those sides to which the sidewall portions are connected, being relieved at their ends adjacent to said other panels so that the blank can fold freely to form a platform bottom when setting up the blank.

13. The merchandising container blank described in claim 8, characterized by said connecting panel and other panels of the blank being of sheet material and extending beyond both ends of the panels that extend downwardly from the bottom of the container and that support the bottom above the surface on which the container rests, the extending portions being continuations of both the downwardly extending panels and the bottom edge of the sidewalls beyond the ends of the bottom-supporting panel, said extending portions being in positions to fold, to form fillers at the bottom corner of the box to prevent sifting of powder or leaks of liquid from the corners of a container set up from the blank.

14. The merchandising container blank described in claim 13, characterized by the extending portions of the blank being a film bonded to the blank, the other sheet material of the blank being cut away and the film constituting the continuations of said panels and said sidewalls that fold at the bottom corners of the box to prevent sifting of powder or leaks of liquid, said extending portions being of one-piece construction with the film that is bonded to said panels and sidewalls.

15. The merchandising container blank described in claim 8, characterized by the sidewall portions that laterally extend beyond the ends of said connecting panel and that form bottom edges of the sidewall of the container extending from the ends of the score line at which the sidewall portions join said connecting panel and being generally in alignment with said score line.

16. The merchandising container blank described in claim 8 characterized by only one of the sides of the bottom being connected with the sidewall portion of the blank, the sidewall portion beyond each of said score lines having a panel corresponding to said connecting panel but not connected to the bottom and adapted to fold back 180° to form a fold for receiving a panel that is connected to the bottom along the side of the bottom that contacts each side when the blank is set up to form a container, each of the panels corresponding to said connecting panel and connected to the sidewall portions beyond the score lines closest to the opposite ends of said connecting panel having ends spaced from the end of said connecting panel by a distance equal to the height of the panels that are connected to the bottom along sides of the bottom that are not connected with the sidewall portion, and a plastic film bonded to one side of the blank and extending beyond the ends of said connecting panel and beyond the ends of the panels that connect to the bottom along other sides of the bottom, the plastic film also extending beyond an end of the sidewall portion of the blank that forms the inner lap of a side seam of the container when the blank is set up to form a container.