United States Patent [19]

Person

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[45] **July 3, 1973**

[54] **NESTABLE, STACKABLE, LEAK-PROOF CONTAINER**

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[52] **U.S. Cl.** ..... **229/31 R,** 229/16 A

[51] **Int. Cl.** **B65d 5/24**

[58] **Field of Search** ..... 229/16 A, 16 C, 31, 229/41 D, DIG. 11

[56] **References Cited**

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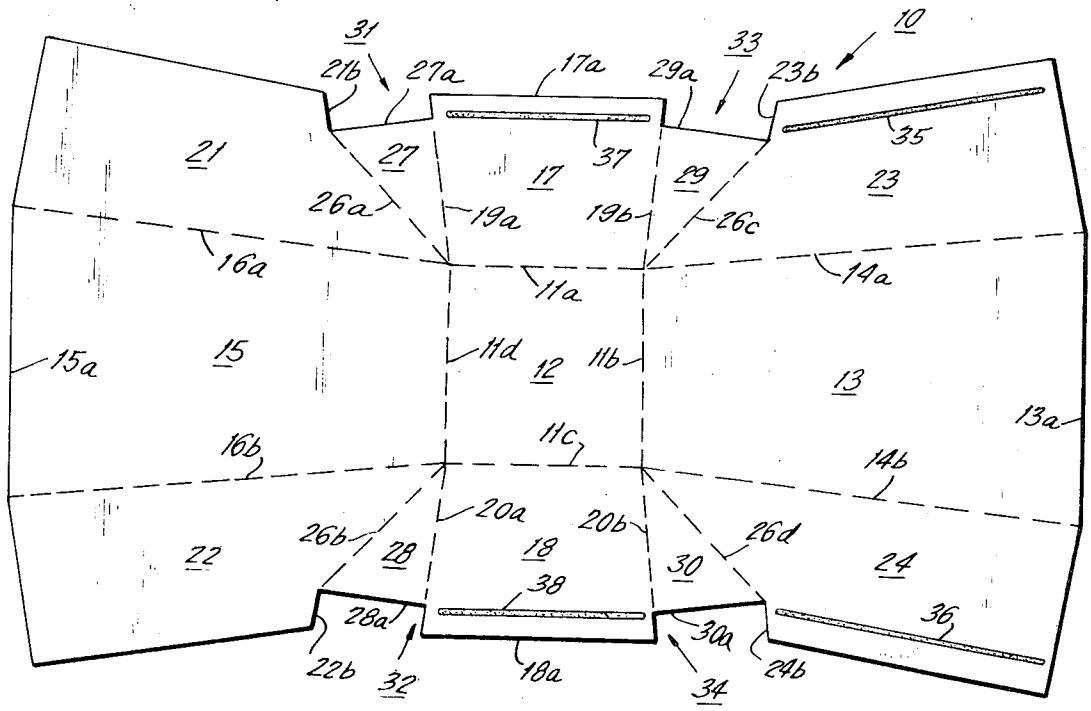
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[57] **ABSTRACT**

A nestable, stackable open-ended container having a leak-proof characteristic at least to the extent required for its specific application. The container is formed from a single sheet of stock which is scored, provided with stripes of adhesive positioned along selected marginal portions thereof and then bent to form a container of slightly tapered configuration with a narrower base portion widening to the openended mouth thereof. The tapered configuration facilitates the nesting of a large number of such containers into one another. The substantially box-shaped configuration facilitates stacking thereof. The container is especially adapted for use in dispensing hot buttered popcorn so as to prevent the melted butter from leaking through the container.

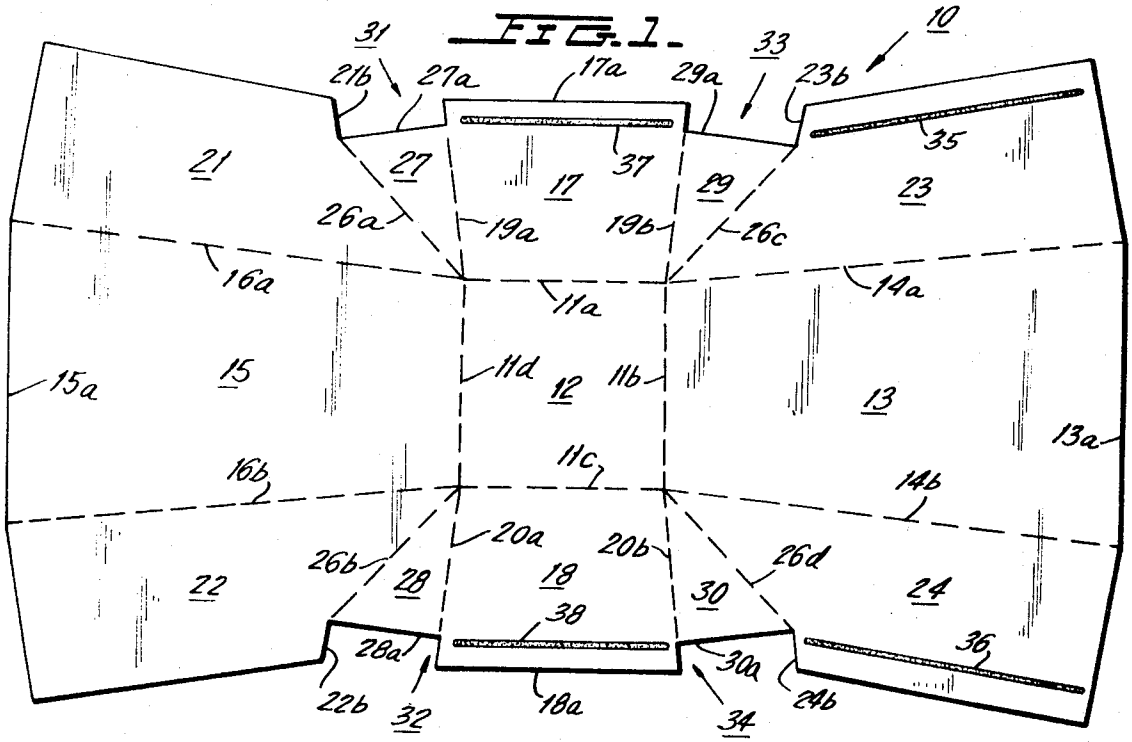
2 Claims, 5 Drawing Figures



Patented July 3, 1973 3,743,169

2 Sheets-Sheet 1

FIG. 1.



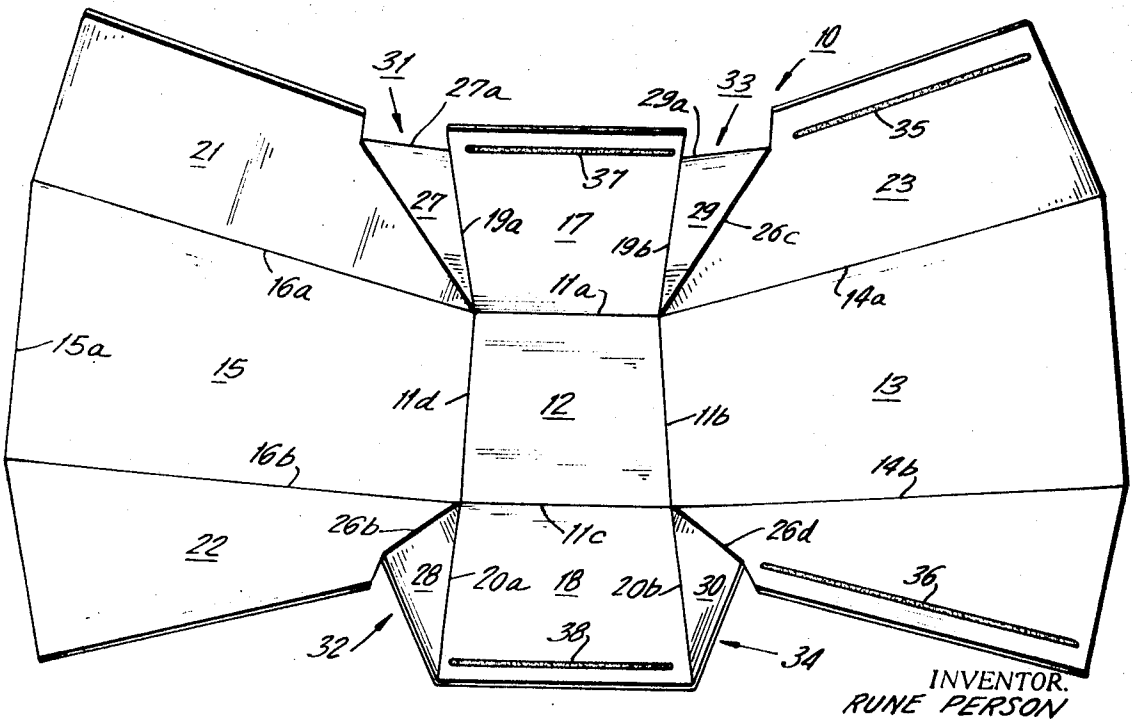


FIG. 2.

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Patented July 3, 1973 3,743,169

2 Sheets-Sheet 2

FIG. 3.

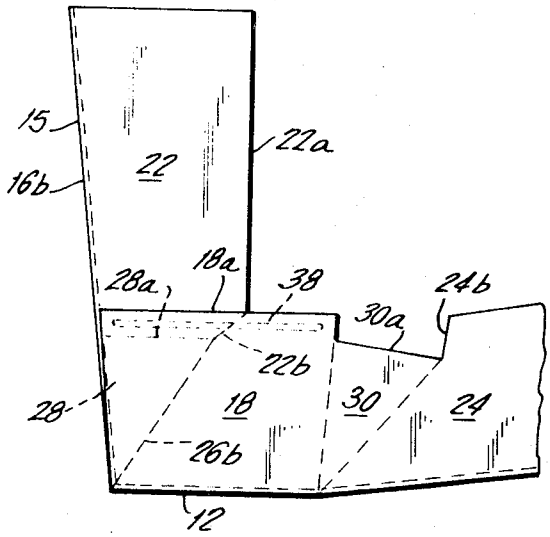


FIG. 4.

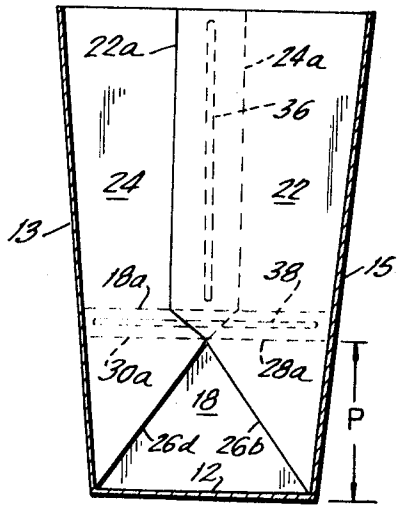
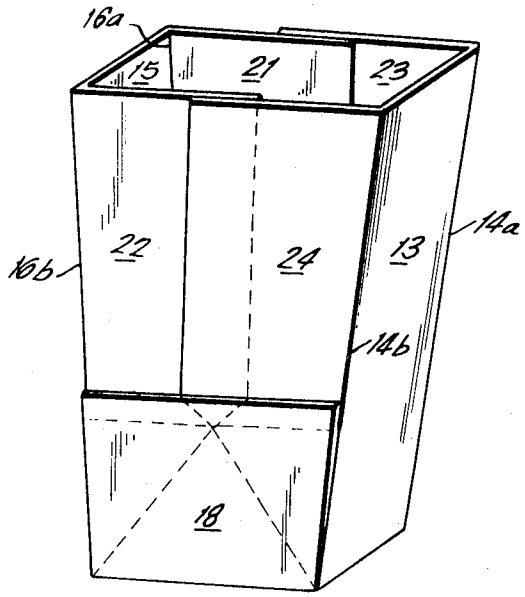


FIG. 5.



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NESTABLE, STACKABLE, LEAK-PROOF CONTAINER

The present invention relates to containers and more particularly to an open-ended container formed from a (small blank) of stock which is adapted to be nestable, stackable and leak-proof.

BACKGROUND OF THE INVENTION

Containers find widespread use, especially in the food industry. Containers of the closable or open-ended type for example, find widespread use as popcorn containers, some six hundred million containers being used yearly in the United States alone. One conventional popcorn container consists of a foldable blank having self-locking flaps at its bottom end (or alternatively at both ends thereof) enabling the container to retain its box-like configuration. Such containers have the advantage of being capable of being shipped in knocked-down fashion so as to greatly reduce handling and shipping costs. However, a very significant portion of popcorn sold nowadays includes the addition of melted butter which seeps to the bottom of the container and leaks through the flaps subjecting the user to soiled or damaged clothing.

In an effort to overcome these disadvantages, cup-shaped containers have been emerging as the prominent type of popcorn container presently being employed. The preferred cup-shaped container has a substantially truncated conical shape tapering from a circular shaped narrow diameter base to a wider diameter mouth. Such cup-shaped containers, while being stackable and nestable, are formed from a minimum of at least two separate and independent blanks, i.e. the circular base member and the truncated conical wall portion. In addition, such cup-shaped containers are substantially more expensive than the aforementioned box-like containers due to the complexities of assembly. The shortcomings of the containers presently in use have thus led to a search for a box-like container which is easily and quickly assembled and is both inexpensive and leak-proof. The present invention describes such a container.

BRIEF DESCRIPTION OF THE INVENTION

The container of the present invention is a nestable, stackable open-ended box-like container formed from a single blank sheet wherein the deviation from a simple rectangular shape sheet is minimal so as to reduce the amount of waste resulting from such a blank. The box is cut from a single blank sheet and is either simultaneously or subsequently scored so as to facilitate bending of the die cut sheet to form the completed container. Elongated beads of adhesive are laid down upon selected marginal portions of the die cut blank after which the blank is then formed by being bent along the scored portion to form the container. Once the die cut blank has been appropriately folded, heat and pressure are applied to the engaging portions of the die cut sheet to adhesively secure said engaging portions so as to yield a tapering open-ended boxshaped nestable, stackable container whose side walls taper outwardly from a substantially rectangular shaped base portion to a widened mouth portion which facilitates grasping of the contents therein.

It is therefore one object of the present invention to provide a nestable, stackable, open-ended container which is substantially leak-proof at least to the extent

to which such characteristic is required and which is formed from a single die cut sheet.

BRIEF DESCRIPTION OF THE FIGURES

This as well as other objects of the present invention will become apparent when reading the accompanying description and drawings in which:

FIG. **1** is a plan view of a die cut blank which has been scored to facilitate forming of the blank into a container embodying the principles of the present invention.

FIG. **2** is a perspective view showing the initial stages of folding of the blank along the scored portions thereof preparatory to formation of the container.

FIG. **3** is an elevational view, partially sectionalized, showing one end wall portion in partially folded fashion, just prior to engagement and joinder thereof.

FIG. **4** is an elevational view showing an interior view of the end wall portions of FIG. **3**.

FIG. **5** is a perspective view showing a fully assembled container.

DETAILED DESCRIPTION OF THE FIGURES

FIGS. **1–5** show the developmental manner (i.e. the procedural steps) undertaken in assembling the container of the present invention. The container is formed from a single blank sheet **10** shown best in FIG. **1**. The perimeter of the sheet can be seen to depart rather slightly from a pure rectangular configuration so as to utilize almost all of the sheet from which the blank has been cut and thereby reduce waste substantially to a minimum. The blank **10** is preferably die cut from a sheet of stiff paper or cardboard having the characteristics of being substantially water resistant and/or waterproof and its exterior surface may preferably be coated or otherwise treated so as to resist deterioration from water or other liquids. The blank is scored in a manner shown best in FIG. **1** so as to define bend lines which facilitate bending of the blank to form the fully assembled container. A first group of score lines or depressions **11**a through **11**d serve to form and define a base or bottom wall portion **12** with all the remaining score lines extending radially outward from each of the corners of the blank **10**. One continuous side wall **13** of the blank is defined by scoring **11**b and a pair of diagonally aligned scorings **14***a* and **14**b which extend from adjacent corners of base **12** to the right-hand end of the sheet (relative to FIG. **1**). A similar shaped continuous side wall **15** is defined by scoring **11**d and a pair of diagonally aligned scorings **16***a* and **16***b* extending radially outward from the remaining adjacent corners of base **12**. The continuous side walls **13** and **15** are substantially identical to one another and can be seen to have a tapering shape wherein the ends of the side walls **13** and **15** defined by scoring **11***b* and **11**d respectively are shorter in length than the outermost edges **13***a* and **15***a* respectively of the side walls **13** and **15**.

A short end wall **17** is defined by scoring **11***a* and a pair of diagonally aligned scorings **19***a* and **19***b* which extend radially outward from adjacent corners of base portion **12**. A similarly shaped short end wall **18** is defined by scoring **11***c* and a pair of scorings **20***a* and **20***b* which extend radially outwardly from the remaining adjacent corners of base portion **12**. The blank is further comprised of four upper end wall portions **21–24**, respectively. For example, end wall portion **21** is defined by scoring **16***a* and scoring **26***a*; end wall portion

22 is defined by scoring 16*b* and scoring 26*b* and so forth.

Four gussets 27–30 are provided in the blank to facilitate folding and enhance the leak-proof characteristics of the continer with the gussets each being defined by associated scorings. For example, gusset 27 is defined by scorings 19*a* and 26*a*, gusset 28 is defined by scorings 20*a* and 26*b*, and so forth.

A notched portion is provided adjacent each gusset to facilitate folding and interlocking of the end wall portion in a manner to be more fully described

FIG. 2 shows blank 10 in the first stages of folding preparatory to formation of the final container, which operation may take place in an automatic fashion so as to substantially simultaneously form all, or nearly all, of the folds in a single operation. Obviously, however, the blanks may be either manually or semi-automatically bent into their appropriate configuration, if desired.

As can be seen from FIG. 2, side walls 13 and 15 are bent upwardly (i.e. out of the plane of the Figure) and toward one another along scorings 11*b* and 11*d*, respectively. In a like manner, short end walls 17 and 18 are bent upwardly and toward one another along the scorings 11*a* and 11*c*, respectively.

The end wall portions 21 and 22 are bent upwardly and toward one another along scorings 16*a* and 16*b*, respectively, while the end wall portions 23 and 24 are likewise bent upwardly and toward one another along the scorings 14*a* and 14*b*, respectively.

The gusset 27 is bent so as to have its inner surface engage the inner surface of short end wall 17 and so as to have its exterior surface ultimately engage the exterior surface of end wall portion 21. This is done by bending the blank along the scorings 19*a* and 26*a*. The remaining gussets are bent in a similar fashion so that each of their interior surfaces engage the interior surface of their associated upper end wall portions while their exterior surfaces are bent so as to ultimately engage the exterior surface of their associated end wall portions.

The blank can be seen to be provided with four elongated beads 35–38 which beads of adhesive are preferably laid down upon the blank before bending and preferably at least subsequent to the die cut operation. These beads are respectively laid down upon the blank portions 23, 24, 17 and 18 and serve to retain the container in its fully assembled condition for a substantially indefinite time period, as will be more fully described.

FIG. 3 shows an elevational view of one end wall portion 22 in the final position while FIG. 4 shows an interior view of both end wall portions 22 and 24 in the final position together with the short end wall 18. As can best be seen from FIG. 3, end wall 22 has its vertical edge 22a aligned substantially perpendicular to the base portion 12 of the container after having been bent along scoring 16*b*. Gusset 28 is substantially completely concealed from view with its opposing surfaces engaging respectively the exterior surface of end wall portion 22 and the interior surface of the short end wall portion 18. FIG. 4 shows an interior view of the container with both end wall portions 22 and 24 being arranged in their final position. As can clearly be seen, the marginal portion of end wall 22 adjacent its vertical edge 22*a* overlaps with a similar marginal portion which lies adjacent the vertical edge 24*a* of end wall portion 24. These end wall portions are firmly pressed together and, while exposed to heat as well as pressure, are caused to be joined to one another due to the adhesive bead 36 which is heated to an amount sufficient to become tacky or flow and thereby adhesively join the two marginal portions.

In a similar fashion, the short end wall portion 18 is pressed against the exterior surfaces of end wall portions 22 and 24 and, in the presence of heat, is caused to adhere to the end wall portions due to the adhesive bead 38. The free edges 28*a* and 30*a* of gussets 28 and 30 (note also FIG. 1) can be seen to lie immediately below adhesive bead 38 which, due to its close proximity to the edges of the gusset, provides adequate sealing strength for maintaining the gussets sandwiched between the end wall portions 22 and 24 and the short end wall portion 18.

FIG. 5 shows a perspective view of the nestable, stackable container in its fully assembled form. It can be seen that, due to the nature of the construction, the container is completely leak-proof at its lower portion P (note FIG. 4). It should further be noted that whereas the container may not be leak-proof over its entire length (i.e. if it were to be completely filled with a liquid) it should nevertheless be noted that insofar as its intended purpose is concerned, the amount of liquid inserted into the container under normal circumstances would never fill the container to an amount shown by the level P of FIG. 4 thus being substantially fully leak-proof for the purposes for which it is intended. It should further be noted that if any liquid were to flow down the interior surfaces of the end portions, the escape of this liquid would be impossible due to the fact that the upper edges 18*a* and 17*a* of each short end wall (note also FIG. 1) is positioned above the interiorly positioned diagonally aligned edges 22*b* and 24*b* as shown best in FIGS. 1, 3 and 4 so that it is not possible for any liquid falling downwardly by gravity to escape from the container. Also, the adhesive beads 37 and 38 substantially completely seal the region adjacent the diagonal edges 22*b* and 24*b* so as to prevent any escape of a liquid from the end walls of the box in the regions of the upper edges of short end wall portions 17 and 18.

The diagonally aligned edges 22*b* and 24*b* of end wall portions 22 and 24 (as well as the diagonally aligned edges 21*b* and 23*b* of end wall portions 21 and 23 shown best in FIG. 1) further serve to reduce the thickness of plies of the container in the region of these edges so as to provide a more compact end wall structure of the thinnest practical profile for the container to facilitate its nesting and stacking capabilities.

The nesting characteristic obtained as a result of the tapered configuration of the container enables a rather large number of such containers to be telescoped into one another while at the same time providing a stack of such nestled containers with a high degree of stability enabling them to stand upon a support or other surface without the need for independent supporting structures. The cost of such containers, which is a significant factor in their marketability, is significantly less than half the cost of the cup-shaped or cylindrical shaped containers presently in use, thereby greatly enhancing their marketability.

It can be seen from the foregoing description that the present invention provides a novel nestable, stackable, openended substantially leak-proof container especially adapted for use in the dispensing and sale of popcorn and which is formed from a single die cut and

scored blank so as to facilitate assembly, handling and storage.

Although the invention has been described with respect to its preferred embodiments, it will be understood that many variations and modifications will be obvious to those skilled in the art. It is preferred, therefore, that the scope of the invention be limited not by the specific disclosure herein but only by the appended claims.

The embodiments of the invention in which an exclusive privilege or property is claimed are defined as follows:

1. A nestable, stackable open-ended container comprising a single die cut blank which is scored near the center thereof to form a continuous rectangular shaped base portion;

first and second continuous side wall portions each having a pair of diagonally aligned scorings and being integrally joined to opposite sides of said base portion along a first pair of parallel scorings which define said base portion;

first and second short lower end walls being integrally joined to the remaining opposite sides of said base portion along the remaining pair of parallel scorings defining said base portion;

first, second, third and fourth upper end wall portions; said first and second upper end wall portions each being integrally joined to the ends of said first side wall along the diagonal scorings of said first side wall;

said third and fourth upper end wall portions being integrally joined to the ends of said second side wall along the diagonal scorings of said second side wall;

the vertically aligned marginal edges of said first and third and said second and fourth upper end wall portions respectively being partially overlapped when said side walls and end walls are folded along the scorings defining said base portion and along the diagonal scorings defining the sides of said side wall portions;

first and second gusset portions each having a triangular shape defined on two sides thereof by scorings and a third free unconnected edge; each of said gussets having one of their sides integrally joined to the first lower end wall along one of said scorings and having another one of their sides integrally joined to the first and third upper side wall portions along another one of their scorings;

third and fourth gusset portions each having a triangular shape defined on two sides thereof by scorings and a third free unconnected edge;

said third and fourth gusset portions each having one of their sides integrally joined to the second short lower end wall along one of their scorings and another one of their sides integrally joined to the second and fourth side wall portions along another one of their scorings;

the free edges of each of said gussets being spaced inwardly from the outer edges of the short end wall and upper end wall portions to which the gussets are joined, to define a notch when the container blank is in the flat unfolded position;

the gussets being positioned between their associated short end walls and upper end wall portions when said container is folded and fully assembled to provide a lower, leak-proof portion for said container;

the upper free edges of said first and second short lower end wall portions being positioned a spaced distance above the free edges of the associated gussets when the carton blank is in the folded position whereby said upper free edges abut the respective exterior surfaces of said first and third and said second and fourth upper end wall portions intermediate their ends;

adhesive means securing the partially overlapping portions of said first and third and said second and fourth upper end wall portions respectively, and securing the upper marginal portions of said first and second short end wall portions respectively to said first and third and said second and fourth end wall portions to form a tapered container having diagonally aligned side and end walls forming an open end dimensionally larger than said rectangular base portion to facilitate stacking of a large plurality of said containers with each such container telescopingly receiving the next upper container.

2. The container of claim **1** wherein said lower end walls overlie the exterior surfaces of their associated upper end wall portions above the free edges of the gussets to prevent liquids which may run down along the interior surfaces of said end walls from escaping from said container.

* * * * *