Oct. 27, 1959 J. P. HAMILTON 2,910,220

PRODUCE TRAY OR CONTAINER

Filed May 3, 1957 2 Sheets-Sheet 1

FIG_1

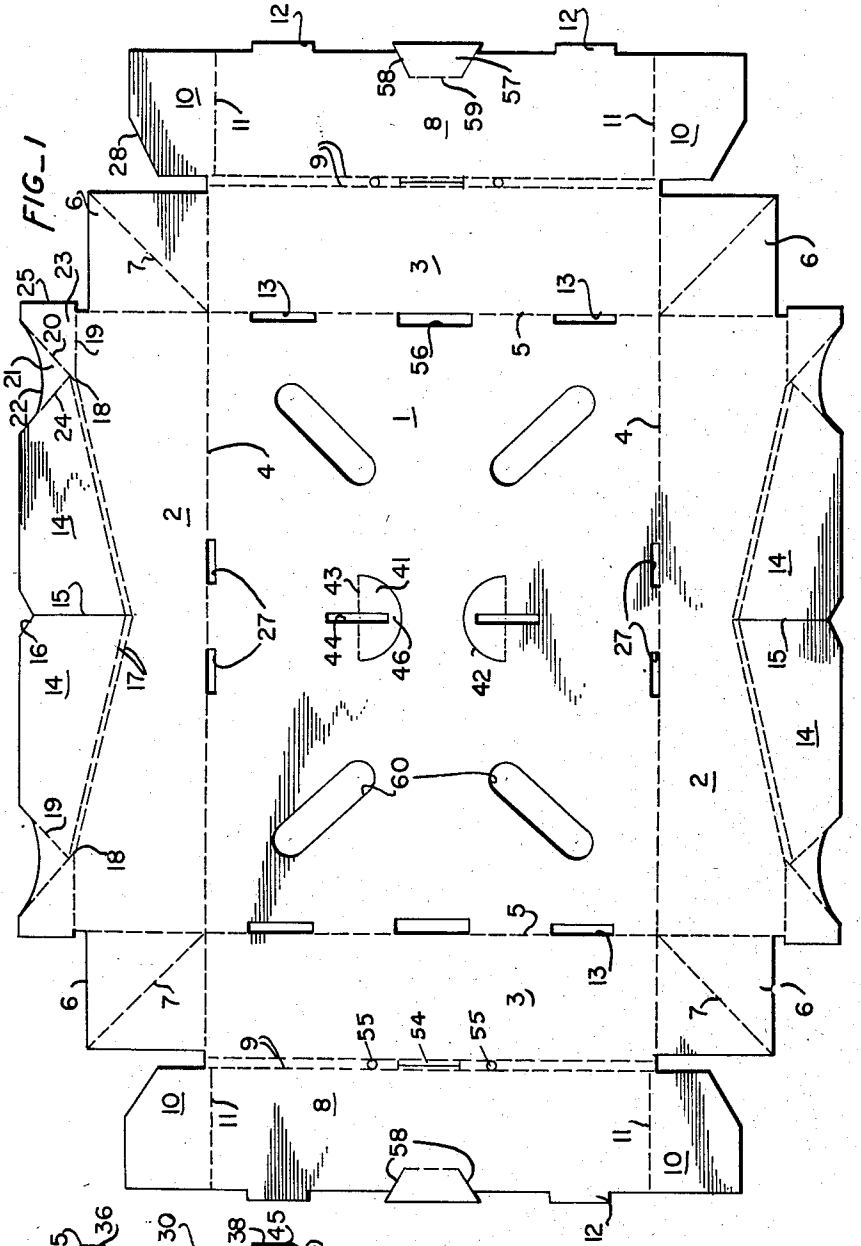
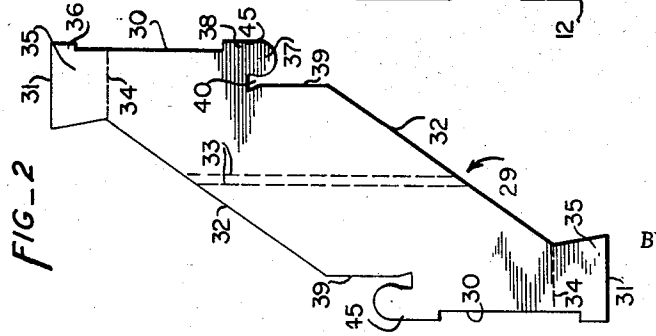


FIG_2



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FIG_7

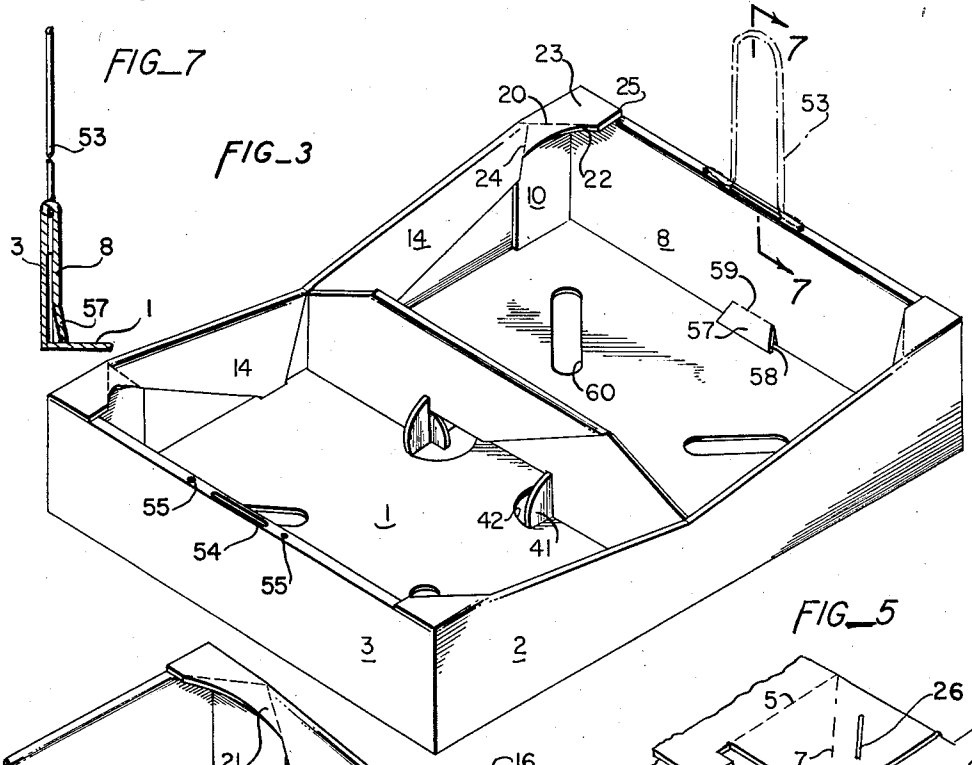


FIG_3

FIG_5

FIG_4

FIG_6

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PRODUCE TRAY OR CONTAINER

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Application May 3, 1957, Serial No. 656,935

3 Claims. (Cl. 229—15)

This invention relates to a produce tray or container, and has for one of its objects the provision of a container of knock-down construction of a type that is more readily adapted for being manually or mechanically folded or set up for use than heretofore, and which container is of a structure that is more economical to make from the standpoint of material and manufacturing complexities than heretofore and which container provides better support for the bottom, better ventilation and better strength than other containers of a similar type and for similar use.

Another object of the invention is the provision of a container adapted to be folded from a blank to provide roll end and roll side construction and at the same time to provide corner rests at the corners of the upper open side of the container adapted to be supported on the double layer roll end of the container.

A still further object of the invention is the provision of a container adapted to be folded from a blank to provide a container adapted to receive a partition and which blank is provided with means for connecting the bottom wall with the partition to support said bottom wall against sagging under a load thereon.

An additional object of the invention is the provision of simple means in a produce container for facilitating the operation of inserting conventional wires to combine two containers.

A still further object of the invention is the provision of a container of relatively lighter weight than containers heretofore employed for similar use, and which container is stronger in use and easier assembled or set up from a knock down condition than heretofore.

Another object of the invention is the provision of a produce container adapted to be supplied to the user in a knock down, unassembled state, and which container is of a construction that enables it to be quickly assembled mechanically or manually without resorting to the use of nails, staples, adhesives, tape etc., and which container, when assembled manually, does not require highly skilled labor.

An added object is the provision of a container that may be supplied to the user in a partially assembled state, to facilitate manual assembly.

Other objects and advantages will appear in the description and in the drawings:

In the drawings, Fig. 1 is a plan view of the blank from which the container is adapted to be formed.

Fig. 2 is a plan view of the blank from which the partition is adapted to be formed.

Fig. 3 is an isometric view of a container, the dotted line portion indicating one form of a conventional wire that may be employed at both ends of the container.

Fig. 4 is a fragmentary isometric view illustrating the container at a stage in the folding of the blank showing the formation of the corner rests.

Fig. 5 is a fragmentary isometric view showing one corner of the blank folded for shipment to the user in a

form that may be used to facilitate manual assembly, if desired. All four corners have the same structure.

Fig. 6 is a plan view of a blank adapted to form a partition having a slightly different structure from that of Fig. 2; and Fig. 7 shows a wire at line 7—7 of Fig. 3.

In detail, the blank of Fig. 1 comprises a rectangular bottom wall 1, a pair of side walls 2 and a pair of end walls 3. The side walls 2 are adapted to be folded along spaced parallel creases 4 to opposed upright relation and end walls 3 are adapted to be folded along spaced parallel creases 5 to opposed upright relation.

A rectangular corner piece or corner web 6 is at the adjacent ends of the side and end walls integrally connecting them and the creases 4, 5 extend beyond their intersections to define two of the adjacent edges of each corner piece or corner web. Each corner web is preferably cut and creased along a diagonal line 7 extending centrally across each corner web from the point of intersection of creases 4, 5. The "cut and crease" 7 facilitates folding of each corner web on itself and inwardly into the container when the side walls 2 and end walls 3 are moved to upright positions perpendicular to the bottom wall.

There is nothing new in the foregoing structure alone, since this structure is old in folding boxes designed for manual or for machine assembly. By "assembly" is meant setting up the box. The parts, except for a partition, later to be described, are all formed from a single cardboard blank of which the bottom wall is a portion. Preferably the cardboard blank is of double faced corrugated fiberboard with the corrugations extending lengthwise of the container, but the invention is not to be considered as being limited to such material, hence the word "cardboard" as used herein is intended to have the broad significance of any foldable sheet suitable for forming the container.

In the industry "roll end" and "roll side" constructions refer to containers in which the ends and sides include flaps integral therewith along the upper edges of the end and side walls that are folded into the box along said edges to positions against or substantially against the inner surfaces of said side and end walls. Thus the upper edges of the end and side walls are along the bends and are not raw edges of the material. In the case of corrugated fiberboard the edges would be closed by the outer layer or face of the cardboard and would be smooth.

The present invention, as will later be described, provides for the above roll end and roll side construction, which is readily adapted for either manual or machine assembly, but in which the folding of the flaps on the side walls automatically forms flat corner rests in opposed relation to the bottom wall supported along one of their edges on the roll ends of the box, which means that a double layer of board supports each corner rest.

In order to accomplish the above results each of the end walls 3 has an elongated end flap 8 integral therewith extending substantially from end to end of the end wall that carries it, and each flap is foldable inwardly into the container along a pair of relatively closely spaced parallel creases 9. Extension flaps 10 are integral with each end flap and extend outwardly of the ends of each end flap. Cut-creases 11 along lines parallel with, but slightly offset inwardly from the ends of creases 4 toward the center of each end flap, define the juncture between each extension flap 10 and the end flap carrying it.

When the corner webs 6 are folded into the container and the end walls 3 and side walls 2 are perpendicular to the bottom wall, it will be seen that the extension flaps 10 may readily fold inwardly to positions perpendicular to the flaps 8 and over the inner surfaces of the side walls 2, said extension flaps being in opposed substantially parallel relation to the side walls (Figs. 3, 4).

The end flaps 8 are formed with outwardly projecting sections 12 along their longitudinally extending edges, and these projections are adapted to snap into elongated openings 13 formed in the bottom wall along its end edges when the flap 8 is folded into the container to a position against the inner surface of wall 3. When in this position the outer edge of the flap 8 at opposite sides of said projections 12 and the edges of extensions 10 in extension of the outer edges of the flaps 8 will be against the bottom of the container so that any compressive load on the end walls in the plane thereof will be shared by the flaps 8, and since the corrugations in the board extend transversely of said end walls and flaps, the maximum resistance to deformation or collapse under such load is provided. It should also be noted that the folded webs 6 are directly below the corner rests.

The side walls 2 are each provided with a pair of side flaps 14.

The outer free edges of these flaps may be parallel with the creases 4 and a cut 15 perpendicular to said creases extends from a point approximately midway between the free outer edge of each flap and crease 4 adjacent thereto to said outer edge. Preferably the flaps 14 are cut to provide angularly extending corner edges 16 joining the outer end of each cut 15.

The junctures between the flaps on each side wall and the latter are defined by double creases 17 or cut-creases extending slantingly outwardly from the inner end of cut 15 to points 18 that are spaced from but relatively close to the outer edge of each corner web 6 (Fig. 1).

A crease 19 that is substantially parallel with crease 4 extends from the point 18 at the outer end of each pair of double cut-creases 17 to the free end edge of each flap 14 that is opposite to cut 15. This terminating end of each crease 18 is slightly spaced outwardly of the corner web 6 (Fig. 1).

Extending from each point 18 and forming an acute angle relative to the double creases 17 adjacent thereto, and extending across each flap 14 in direction generally toward cut 15 and to the free outer edge of the flap is a crease 24. A similar crease 20 extends from each point 18 to form an obtuse angle with the adjacent double creases 17, and each crease 20 extends to the outer free edge of each side flap 14 and to a point spaced a short distance from the free end edge of each flap.

It will be seen from the foregoing that the generally triangular portion 21 between the creases 20, 24 forms a gusset. Preferably the outer free edge of this gusset 21 is arcuately cut away to form a concavely curving edge 22.

The portion 23 at the end of each flap 14 between the free end edge 25 and the crease 20 is the corner rest.

A crease 24 defines the edge of the corner piece joining each wall 2, and this crease extends from point 18 to a point along the free end edge of each flap 14 spaced from the corner web 6 that is adjacent thereto. The free end edge 25 of each flap 14 between the outer end of each crease 24 and the portion of the corner rest 23 at the outer end of crease 20 projects outwardly of the end of crease 5 as seen in Fig. 1.

If desired the portions of the blank of Fig. 1 that are outwardly of creases 4, and which portions comprise the corner webs 6, side wall and flaps 14 may be folded flat against one side of the bottom wall and a staple 26 (Fig. 5) or other suitable means used to secure the webs 6 to each end portion of side walls 2 at the side of each cut-crease 7 adjacent to the end of crease 4. If this is done, the four sides of the box will automatically rise to positions perpendicular to the bottom wall upon moving either pair of opposed walls 2 or 3 to vertical position.

In any event, in setting up the container, the corner webs 6 at one end of the box (or simultaneously at both ends) are folded inwardly into the container alongside the end wall connected therewith.

Each end flap 8 is then folded into the box against the inner side of the end wall carrying the same and the extension flaps will then be alongside and in opposed relation to the inner surfaces of the end portions of side walls 2. The folded webs 6 will be between each end flap 8 and the end wall 3 adjacent thereto.

The projections 12 will automatically secure the end flaps 8 vertically in position locking the folded corner webs between the end flaps and the end walls, hence the four sides of the container will be held perpendicular to the bottom wall.

Without going into partition structure at this time, the container, apart from the partition, may be completed by folding the side flaps 14 into the container against the inner opposed surfaces of the sides 2. Slots 27 formed in the bottom wall (Fig. 1) along the side walls 2 are adapted to receive the corners of the flaps 15 along the edges 16 when the said flaps 14 are folded as above described, which locks the flaps 14 against the sides of the walls 2.

As seen in Figs. 3, 4 when flaps 14 are folded over, as above described, the projecting portions of the corner rests 23 along the edges 25 thereof will automatically engage the upper roll edge of the end walls and will be supported on said end walls, with said rests flat and horizontal and opposed to the bottom wall at the corners of the container. The gussets 21 will extend angularly and downwardly into the container and the arcuate edge 22 along each gusset will oppose the angularly cut corner edge 28 of extension flaps 10 so that the main body portions of flaps 14 will be coplanar with said extension flaps. Also said arcuately extending edges 22 may provide a clearance for berry boxes that are adapted to be positioned on the bottom 1.

The foregoing simple folding operations are readily accomplished mechanically or manually as desired.

Fig. 2 shows a partition that may be used in the box. This partition 29 as seen in Fig. 2 is generally, before folding, in the form of a parallelogram having parallel side edges 30 and parallel end edges 31, with diagonally extending parallel edges 32.

A double score or crease 33 is parallel with and midway between the side edges 30 and upon folding the portions at opposite sides of the crease 33 on themselves along said crease the edges 30 will be substantially in alignment and parallel with the edge along the bend, which will be a closed or rolled edge due to the fold.

Creases 34 extend transversely across the blank forming the partition, which creases are parallel with and spaced a short distance from each end edge 31. These creases 34 define the folding lines for end flaps 35 that are between the creases and the edges 31, and each end flap 35 has a lateral projection 36 along edge 30.

At the end of each edge 30 remote from projection 36 is an ear 37 that is directed longitudinally of the edge 30 and a side of each ear 37 projects at 38 from edge 30 the same distance as projection 36.

When the partition is folded on crease 33 the ears 37 will be spaced apart and will project toward each other, since the material of the partition is relieved at one end of each edge 32 to define parallel edges 39 that extend to the base of each ear 37 at the side opposite to each projection 38. A slot 40 is defined by the end of each edge 39 and the edge of the ear 37 adjacent thereto, and the closed end of each such slot at the base of the ear is enlarged.

The bottom 1 of the container blank has a pair of tabs 41 partially stamped therefrom along semi-circular cuts 42, and connected with the bottom wall 1 along parallel creases 43 that are on chord lines connecting the ends of each arcuate cut 42. These creases 43 are parallel and extend longitudinally of the side walls 2 and are equally spaced at opposite sides of a medial line on the bottom wall that is parallel with the creases.

Extending perpendicularly to and across each crease 43 is a slot 44, which slot extends an equal distance to

opposite sides of each crease 43. Each slot 44 is adapted to receive the marginal portion 45 of each projection 38 that projects beyond each edge 30 of the partition 29.

When the partition 29 is positioned between the side walls 2 midway between end walls 3, one of the end flaps 35 will be against one side wall 2 for being held between one of the side flaps 14 and wall 2 while the other end flap 35 will extend to the opposite side of the partition to be held between one of the side flaps 14 at the other side of the container, the latter side flap being at the side of the partition opposite to the first flap. The projections 45 will extend into the slots 44, and upon swinging the tabs 41 upwardly the web 46 at the end of each slot that is in the tab will move over each projection 37 and into the enlarged end portion of each slot 40 thus locking the tabs and projections 37 together. This interlock between the tabs 41 and projections 37 will hold the central portion of the bottom wall 1 against the lower edge of the partition and therefor the bottom wall cannot sag away from the partition under a load. The corrugations in the partition 29 are vertical, thereby reinforcing the partition against distortion in the plane thereof. It should be noted that the upper edges of the partition at its ends are portions of edges 32 and extend slantingly downwardly to the level of the mid portions of the side walls 2 when flaps 14 are folded into the carton.

Inasmuch as a part of the projecting marginal portions 45 of the projections 37 on the partition also extend into the ends of slots 44 that extend from tabs 41 into the bottom wall, the partition will be held at their mid portions against movement laterally of the partition. The flaps 14 at the ends of the partition and the projections 36 in slots 27 hold the partitions against such movement at their ends, and the edges 30 of the partition rest against the bottom wall. This provides an extremely strong partition and a central support within the container that materially contributes to making the container solid, strong and rigid at its mid portion. The rolled ends and sides plus the folded web corners insure maximum rigidity and strength at the container walls, and the fact that the corner rests are supported on the double layer ends over the folded web corners provides an exceptionally strong and rigid support for superposed loads on said corner rests, which is the point where greatest strength is essential.

The bottom wall 1 is formed with openings 60 for ventilation and which openings may also serve as finger openings through which a finger may be thrust to elevate berry boxes on bottom 1 when the container is used as a tray or carrier for such boxes. Obviously the openings that are formed when tabs 41 are elevated to engage the tabs 37 may also provide finger openings as well as ventilating openings, and if other such openings are needed, they may be readily formed wherever desirable.

The fact that a central recess is provided in the lower edge of the partition between the tabs 37 is important in that this recess provides for through ventilation in the container and the fact that the tab openings communicate directly with this recess and extend across its open side enables efficient ventilation for produce at the center of the container where such ventilation is most needed, and where heretofore the partitions have blocked it insofar as the passage of air over the bottom wall and across the midportion of the container is concerned.

Fig. 6 shows an alternative form of partition in which partition is blank having identical structure at opposite sides of a central double crease 47 so that the blank, when folded, is of double thickness at all points at opposite sides of said crease.

In this partition there are two end flaps 48 each corresponding to end flaps 35 of Fig. 2 and these flaps bend to oppositely outwardly coplanar relationship at each end of the partition for being held between both side flaps 14 at each of the opposite sides of the container and the side wall 2 adjacent thereto.

Projections 49 are identical with projections 37 and two, instead of one are provided for each locking tab 41, hence the slots 44 in the tabs and bottom wall will be slightly wider where the double projections 49 are used.

In setting up the container, it is obvious that the partition of either Fig. 2 or 6 should be positioned within the container before the side flaps 14 are folded into the box. This positioning of the partition is facilitated by the fact that the projections 36 (Fig. 2) or 50 (Fig. 6) are adapted to fit into slots 27 that are along the bottom wall when the marginal portions 45 of projections 37 (Fig. 2) or the marginal portions 51 on projections 49 (Fig. 6) are in the slots 44. The partitions of either Figs. 2 or 6 can be virtually locked in position before the end flaps 14 are folded over.

Referring to Fig. 3 an inverted U-shaped wire 53 is indicated in dotted line as projecting upwardly through a slit 54 formed in and extending longitudinally of the end wall along the rolled upper edge thereof that is between double crease 9. Also a small opening 55 is along said crease spaced slightly outwardly of each end of each slit 54. This structure in itself is not new. In explanation, different types of wire construction is used to provide the U-wires. In some forms the free ends of the legs of the wires extend through openings 55 and then extend laterally to below the bend of the end wall at the upper edge thereof. A slot 56 along each crease 5 at a point midway between its ends enables the upwardly projecting U-bend on a lower container to slide between the double layers of the end walls for emergence through the slit 54 in a superposed container so that the worker may grasp the projecting ends of the U-wires to lift two containers at a time.

Heretofore the stacking of the containers one above the other has been somewhat difficult for the reason that the upper U-bends of the wires 53 have tended to strike the free edge of the inner layer of the end walls in attempting to thread the wire between said layers. This is because the lower free edge of the inner layer would normally extend across the openings 56.

In the present instance a tab 57 projects from the free edge of each end flap 8 at a point midway between the ends of each flap, which tab may have divergently outwardly (relative to the blank) end edges 58 and a bending crease 59 spaced inwardly of the free edge of each end flap connects the convergent ends of said end edges 58. The free outer edge of the tab extending between the divergent ends of the edges 58 is longer than the length of each slot 56.

When the end flaps 8 are folded over against the inner sides of the end walls 3 each tab 57 will engage the bottom wall 1 as seen in Fig. 7 and the tab will be moved away from the adjacent end wall at its free end to provide for free passage of the U-end of wire 53 to between the flap 8 and wall 3. The slanted surface of the tab will guide said wire toward the slit 54.

It is to be understood that the detailed description and drawings represent a preferred form of the invention and are not to be considered as being necessarily restrictive of the invention.

I claim:

1. A produce container formed from a cardboard blank and having a rectangular bottom wall and two pairs of vertical opposed walls respectively connected with the pairs of opposite edges of said bottom wall, a vertical partition wall extending transversely across the upper side of said bottom wall between one pair of said walls, locking tabs partially stamped from said bottom wall below said partition providing ventilating openings, and interengaging means on said tabs and on said partition releasably locking them together and holding said bottom wall and said partition together to prevent sagging of said bottom wall away from said partition under a load on said bottom wall, said tabs being equally spaced from and adjacent to the center of said bottom wall, and means pro-

viding flat horizontal corner rests at the corners of said box at the upper edges of said pairs of opposed walls extending over the opposed sides of the walls between which said partition extends in engagement with opposite end portions of said partition for assisting in holding the latter upright and over said tabs.

2. A produce container formed from a blank of cardboard folded to provide a rectangular bottom wall, a pair of opposed vertical end walls and a pair of opposed vertical side walls, each of said side walls having a side flap integral therewith along its upper edge extending from each of its opposite ends toward a point midway between said opposite ends, each of said end walls having an end flap integral therewith along the upper edge of each end wall extending from end to end of the latter and each end flap having extensions at its opposite ends projecting beyond its said ends, rectangular corner webs connecting said end walls and said side walls at their adjacent ends each folded on itself into the container along a diagonal line, each of said folded webs being against the inner surface of the end wall connected thereto, each of said extensions being at right angles to the end walls respectively carrying them and extending over the side wall adjacent thereto and the end portion of each of said side flaps positioned at each end of each side wall being disposed horizontally over and perpendicular to the folded web and the extension adjacent thereto with the remainder of each side flap bent inwardly into said container to a plane that is approximately parallel to the plane of the side wall carrying the side flap and to the plane in which the said extension is disposed, a vertical partition extending over said bottom wall between said side walls, separate means on the ends of said partition and on at least one of the side flaps on each side wall in engagement with each other for holding said side walls to said partition, and means on said bottom wall and on said partition adjacent to a point midway between the ends of said partition in holding engagement with each other for holding said bottom wall against said partition at said point.

3. A produce container formed from a blank of cardboard folded to provide a rectangular bottom wall, a pair of opposed vertical end walls and a pair of opposed vertical side walls, each of said side walls having a side flap integral therewith along its upper edge extending from each of its opposite ends toward a point midway between said opposite ends, each of said end walls having an end flap integral therewith along the upper edge of each

end wall extending from end to end of the latter and each end flap having extensions at its opposite ends projecting beyond its said ends, rectangular corner webs connecting said end walls and said side walls at their adjacent ends each folded on itself into the container along a diagonal line, each of said folded webs being against the inner surface of the end wall connected thereto, each of said extensions being at right angles to the end walls respectively carrying them and extending over the side wall adjacent thereto and the end portion of each of said side flaps positioned at each end of each side wall being disposed horizontally over and perpendicular to the folded web and the extension adjacent thereto with the remainder of each side flap bent inwardly into said container to a plane that is approximately parallel to the plane of the side wall carrying the side flap and to the plane in which the said extension is disposed, a vertical partition extending over said bottom wall between said side walls, separate means on the ends of said partition and on at least one of the side flaps on each side wall in engagement with each other for holding said side walls to said partition, and means on said bottom wall and on said partition adjacent to a point midway between the ends of said partition in holding engagement with each other for holding said bottom wall against said partition at said point, said partition being formed with a downwardly opening recess at one side of said point providing a ventilating opening communicating between the portions of said container at opposite sides of said partition, a tab partially stamped from said bottom wall and folded upwardly from said bottom wall to provide a ventilating opening in said bottom wall, said means on said bottom wall and on said partition including a portion of said partition along one side of said recess and a portion of said tabs.

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