Oct. 3, 1961 J. L. KOTOWICK 3,002,672

STACKING CARTON

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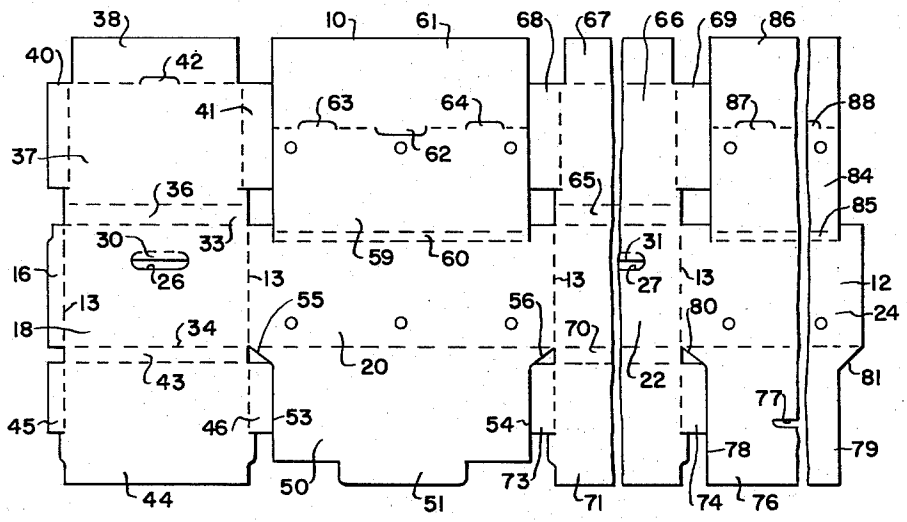


Fig. 1.

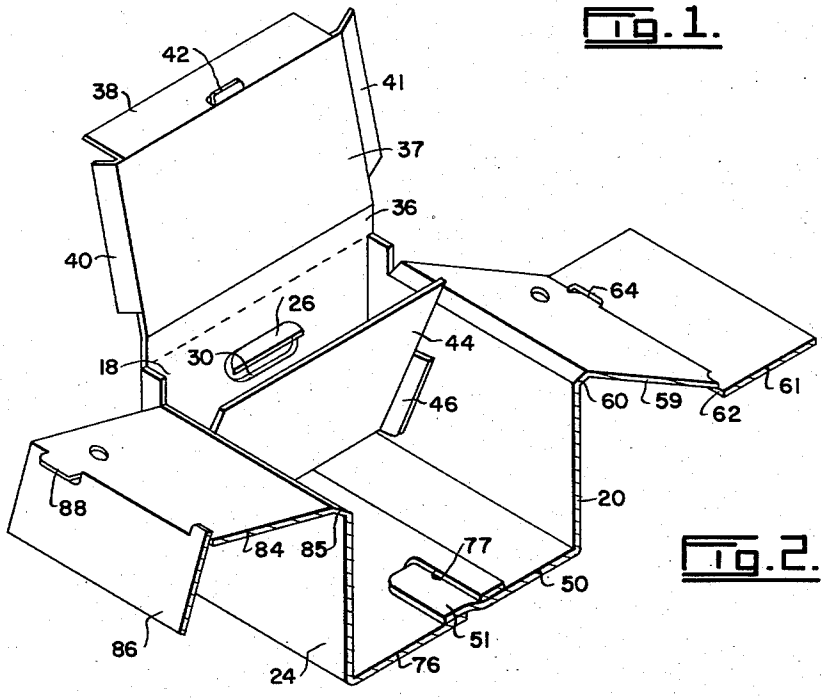


Fig. 2.

INVENTOR.

JOSEPH LAWRENCE KOTOWICK

BY

Fetherstonhaugh & Co.

ATTORNEYS

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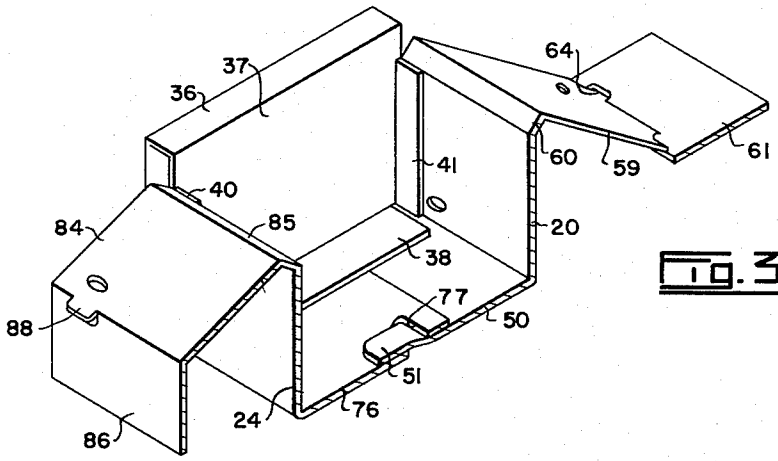


Fig. 3.

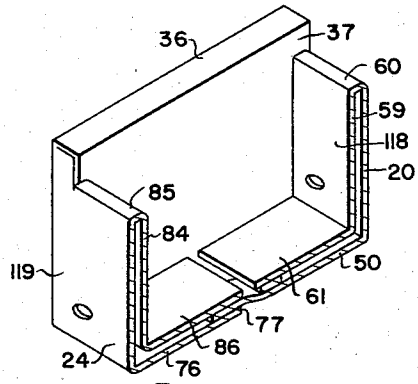


Fig. 4.

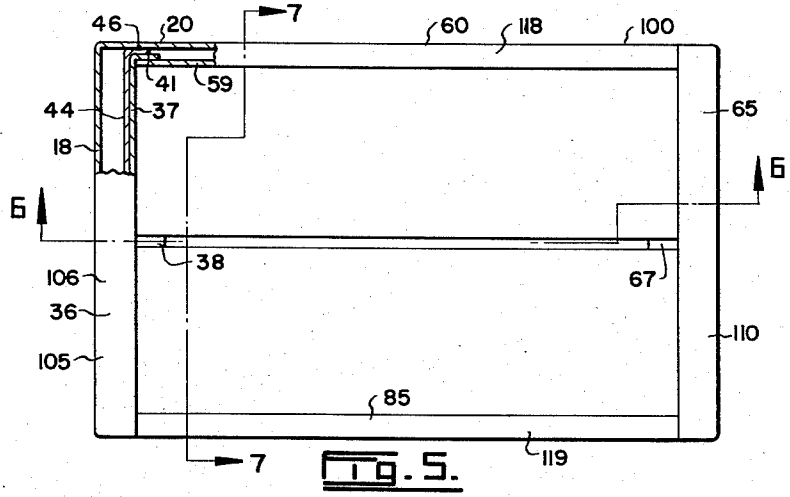


Fig. 5.

INVENTOR.

JOSEPH LAWRENCE KOTOWICK

BY

Fetherstonhaugh & Co.

ATTORNEYS

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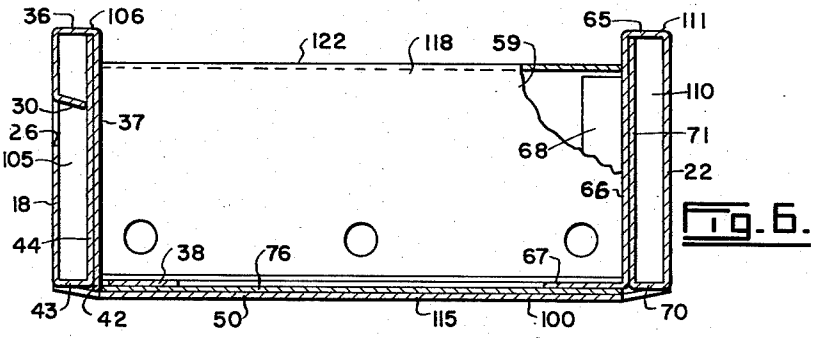


Fig. 6.

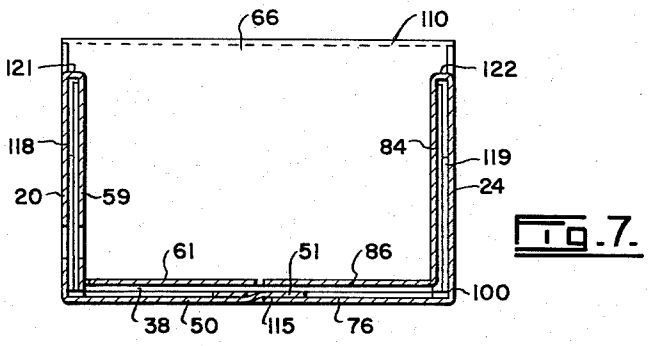
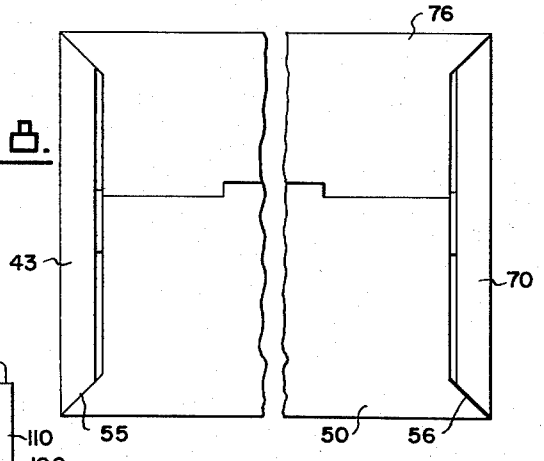


Fig. 7.

Fig. 8.



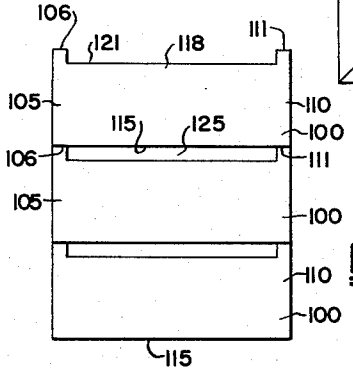


Fig. 9.

INVENTOR.
JOSEPH LAWRENCE KOTOWICK
BY
Fetherstonhaugh & Co.
ATTORNEYS

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3,002,672
STACKING CARTON

Joseph Lawrence Kotowick, Vancouver, British Columbia, Canada, assignor to Crown Zellerbach Canada Limited, Vancouver, British Columbia, Canada, a corporation of British Columbia

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3 Claims. (Cl. 229—16)

This invention relates to improvements in cartons which may be stacked during storage and shipping.

Although these cartons may be used for any desired purpose, they are primarily designed for fruit, particularly, apples, and other produce. Cartons of this type are formed with what are known as pedestal ends which project above the carton top. With this arrangement, when the cartons are stacked, each one above the lowermost one rests on the pedestal ends of the carton immediately beneath it. Thus, the ends take the load, and not the main body of the carton or its contents. Furthermore, a space is left between the general top of each carton and the bottom of the carton above it, to allow for the circulation of air through the cartons when in storage or in transit.

The cartons of this nature of the prior art are generally made up of end walls including two thicknesses or panels of material, which is usually cardboard, paperboard, corrugated cardboard, or the like, said panels being spaced apart to form a stacking shoulder at the upper edges thereof; side walls also formed of two panels, the inner panels of these walls usually extending between the outer panels of the end walls so that the inner panels of the latter walls overlap the ends of the inner panels of the side walls to hold the latter in position; and a bottom made up of two bottom flaps extending inwardly from the outer panels of the side walls and having locking means for interconnecting said flaps. As the side walls are not as high as the end walls, another carton stacked on this carton rests on said end walls.

The cartons of the prior art have functioned reasonably well. However, it has been found that the strength of the end walls is not sufficient. This results in the failure of some end walls and/or the limiting of the height to which the cartons may be stacked. Another difficulty has been encountered in keeping the inner layers of the end walls in position during the setting up of the carton. A great weakness in the prior cartons is the bottom construction. As previously stated, when the cartons are stacked, each one rests at its ends upon the stacking shoulders or pedestal ends of the carton beneath it. In addition to this, the bottom flaps usually terminate short of the carton ends in order to assist in the stacking and keep each carton from shifting longitudinally. As a result of this, the bottom carries the entire load of the contents of the carton while it is stacked. The connection between the bottom flaps usually consists of a tongue on the edge of one fitting into a slot in the other. If the carton is stacked for any length of time, there is a tendency for the two flaps to swing downwardly, at which time, the tongue withdraws from the slot. This results many times in the bottom flaps swinging downwardly when the carton is picked up, spilling the contents.

The present carton eliminates or greatly lessens these difficulties. It is so constructed that each end wall consists of spaced parallel outer or inner panels with an intermediate panel therebetween. The inner panel is connected to an edge of the outer panel by a spacer strip and the intermediate panel is connected to the other edge of said outer panel by a narrower spacer strip. This provides three thicknesses of material in the end wall, thereby greatly strengthening it over the end walls of the

prior art cartons. It is preferable to provide the inner and intermediate end panels with friction tabs on their vertical edges which engage the outer panels of the side walls of the carton to hold said inner and intermediate panels in position during the setting up of the carton.

The bottom of the present carton is made up of outer flaps connected to outer panels of the side walls of the carton and extending inwardly in overlapped relationship. In addition to this, inner flaps are connected to the inner panels of the side walls and extend inwardly over the outer bottom flaps. This in itself greatly strengthens the carton bottom. In addition to this, it is preferable to provide a cross bracing flap on the lower edge of each inner panel which extends between the outer and inner bottom flaps. This braces said bottom flaps from side to side of the carton and helps to keep said flaps from bowing downwardly when the carton is in a stack.

The principal object of the present invention is the provision of a stacking carton which is reinforced at the ends and bottoms thereof beyond the known cartons for the same purpose, and includes reinforcing means for the side walls.

A preferred form of this invention is illustrated by way of example in the accompanying drawings, in which,

FIGURE 1 is a flat lay-out of a blank for forming this stacking carton,

FIGURE 2 is a perspective view of one end of the carton with the outer end panel and two outer side panels set up, and with the intermediate end panel almost in its final position,

FIGURE 3 is a view similar to FIGURE 2 but with the inner end panel and its cross bracing flap in position,

FIGURE 4 is a view similar to FIGURE 3 but with the inner side panels and the inner bottom flaps in position,

FIGURE 5 is a top plan view of the carton completely set up,

FIGURE 6 is a longitudinal section through the carton taken on the line 6—6 of FIGURE 5,

FIGURE 7 is a cross section through the carton taken on the line 7—7 of FIGURE 5,

FIGURE 8 is a bottom plan view of the carton, and

FIGURE 9 shows three cartons on a reduced scale in a stack.

Referring to FIGURE 1 of the drawings, 10 is a blank that has been cut and creased to produce this stacking carton. Although this carton is made up of many interconnected and interwoven panels and flaps, it is formed from a single blank. Any suitable material may be used, such as corrugated sheet, folding box board, fibre board, and the like. The blank is formed with a longitudinally extending central strip 12 that is creased along a plurality of spaced parallel transverse lines 13 to form respectively, from left to right, a fastening tab 16, outer end panel 18, outer side panel 20, outer end panel 22, and outer side panel 24. Thus, the outer side panels are integrally connected with outer end panels 18 and 22, while the free end of side panel 24 is connected by the free end of panel 18 by means of fastening tab 16 when the carton is set up, said fastening tab being secured to panel 24 by glue, staples, or other fastening means. Hand holes 26 and 27 are formed in end panels 18 and 22. It is preferable to leave the material that is partially cut out to form the hand holes attached to their respective panels to form the flaps 30 and 31 at said hand holes.

Crease lines 33 and 34 constitute the upper and lower horizontal edges of end panel 18 when the carton is erected. A spacer strip 36 is formed along edge 33 of panel 18, inner end panel 37 is connected to this spacer strip, and a cross bracing flap 38 is connected to the opposite edge of said inner panel. Friction tabs 40 and 41

are formed on the opposite edges of end panel 37, said tabs extending substantially the height of the panel, this height being the distance between strip 36 and flap 38. A locking tab 42 connected to panel 37 centrally of an edge thereof is cut out of bracing flap 38. Another spacer strip 43 is connected to the opposite edge of end panel 18 from strip 36 and is narrower than the latter. An intermediate end panel 44 is connected to strip 43, while friction tabs 45 and 46 are connected to the opposite vertical edges of said intermediate flap.

An outer bottom flap 50 is connected to one edge of the outer side panel 20, and has a locking tab 51 on its outer or free edge centrally thereof. It will be noted that the length of this flap between end edges 53 and 54 is a little less than the corresponding length of panel 20. The end edges 53 and 54 flare outwardly at 55 and 56 to join the centre strip 12 at the two lines 13 that constitute the ends of panel 20.

An inner side panel 59 is connected by a narrow spacer strip 60 to the opposite edge of side panel 20 from bottom flap 50, while an inner bottom flap 61 is connected to the outer edge of panel 59. The inner side panel and inner bottom flap are aligned with and substantially the same length as outer bottom flap 50. A central spacing tab 62 connected to flap 61 is cut out of panel 59 while friction tabs 63 and 64 connected to panel 59 are cut out of flap 61.

The outer end panel 22 and outer side panel 24 have the same panel, strip and tab arrangements as outer end panel 18 and outer side panel 20, respectively. Panel 22 has a spacer strip 65 along one edge thereof to which is connected an inner end panel 66 having a cross bracing flap 67 along its outer edge and friction tabs 68 and 69 along it side edges. A narrower spacer strip 70 is connected to the opposite edge of panel 22 and has an intermediate end panel 71 connected thereto, said latter panel having friction tabs 73 and 74 connected to the side edges thereof. End panel 66 is provided with a locking tab, not shown, similar to tab 42.

Outer side panel 24 has an outer bottom flap 76 connected to one end thereof, said flap having a slot 77 therein for receiving locking tab or tongue 51 of outer bottom flap 50. The side edges 78 and 79 of this bottom flap diverge at 80 and 81 where they connect with panel 24. An inner side panel 84 is connected to the opposite edge of outer side panel 24 by means of a comparatively narrow spacer strip 85, and has an inner bottom flap 86 connected to its outer edge. Panel 84 is provided with friction tabs 87 and 88, and it also has a spacing tab, not shown, similar to tab 62.

Referring to FIGURES 2 to 8, stacking carton 100 is set up from blank 10 in the following manner. The central strip 12 of the blank is bent on the crease lines 13 to form a rectangle that constitutes the outer side and end panels of the side and end walls of the carton. Fastening tab 16 is secured to the free end of side panel 24. With this arrangement, these side and end walls are foldably connected along their vertical sides and are disposed in tubular relation. Intermediate end panels 44 and 71 are swung upwardly into positions substantially parallel with outer end panels 18 and 22, respectively. As panel 44 moves upwardly between outer side panels 20 and 24, friction tabs 45 and 46 swing inwardly and move along the inner surfaces of said side panels, see FIGURE 2. As these tabs have a tendency to swing outwardly into the plane of panel 44, they frictionally bear against the inner surfaces of panels 20 and 24 to retain the intermediate panel in position during the setting up of the carton. Friction tabs 73 and 74 do the same for intermediate end panel 71. Bottom flaps 76 and 50 are swung inwardly into overlapped position, and locking tab or tongue 51 is inserted through slot 77 to lock these flaps in position to form a bottom closure.

Inner end panels 37 and 66 are swung inwardly and downwardly to complete the end walls of the carton. When panel 37 is swung into this position, friction tabs 40 and 41 slide along the inner surfaces of side panels 20 and 21 frictionally to hold the inner end panel in position while the carton is being set up. When panel 37 reaches its final position, locking tab 42 overlaps the adjacent ends of the bottom flaps firmly to hold said panel in this position. Friction tabs 68 and 69 retain inner end panel 66 in position, during the erecting operation. Cross bracing flap 38 swings into an inwardly-extending position lying over the bottom flaps 50 and 76, see FIGURE 3. Cross bracing flap 67 at the opposite end of the carton also swings to an inwardly-extending position from inner end panel 66 and lies over the outer bottom flaps. The locking tab, not shown, of end panel 66 retains firmly said panel in its final position in the same manner as tab 42 does for panel 37.

The setting up of carton 100 is completed by swinging the inner side panels 59 and 84 inwardly into positions substantially parallel with outer side panels 20 and 24, respectively. Inner bottom flaps 61 and 86 lie over the bracing flaps 38 and 67, and the outer bottom flaps 50 and 76. The spacing tab 62 connected to bottom flap 61 projects outwardly at this time to engage outer wall panel 20 to keep panel 59 parallel to the latter and a similar spacing tab on bottom flap 86 does the same for inner wall panel 84 relative to outer panel 24. Furthermore, friction tabs 63—64 and 87—88 engage the upper surfaces of the latter bottom flaps to keep panels 59 and 84 in place during erection of the carton. It is preferable to make the inner bottom flaps of such size that they extend inwardly to touch or almost touch each other, see FIGURE 4.

FIGURES 5 to 8 illustrate the completed carton 100. Inner end panel 37 is connected at its upper horizontal edge by spacer strip 36 to the corresponding edge of outer end panel 18, and intermediate panel 44 is connected by spacer strip 43 to the lower horizontal edge of the outer panel. These three panels form a multi-ply end 105 for the carton. These panels or the end form a laminated vertical support terminating in a stacking shoulder 106. Similarly, end panels 22, 66 and 71 form an end wall 110 for the carton which is actually a laminated vertical support terminating in a stacking shoulder 111. It will be noted from FIGURES 6 and 7 that cross bracing strips 38 and 67 extend between the inner side panels 59 and 84, and between the outer bottom flaps 50—76 and inner bottom flaps 61—86. As these bracing strips are connected to the end walls of the carton, they brace the carton bottom 115 which is formed by the inner and outer bottom flaps. This bracing takes place at each end of the bottom where it is most needed. These cross bracing flaps make it almost impossible for the bottom flaps to swing downwardly under the weight of the contents of the carton as long as the inner end panels are in their proper positions.

It will be noted that the friction tabs 40 and 41 of inner end panel 37, and friction tabs 68 and 69 of inner end panel 66 lie between the inner and outer side panels 20—59 and 24—84 which constitute the side walls 118 and 119 of the finished carton. As these friction tabs are connected to the end walls of the carton, they act as braces for the inner side panels of the walls at the ends thereof. This prevents the ends of the inner side panels from bowing outwardly under load. When the inner side panels bow outwardly, as they do in the prior art cartons, they have a tendency to cause the outer side panels to bow in the same manner. In the present carton, the inner side panels take a great deal of the lateral load, thus relieving the strain on the outer side panels.

By referring to FIGURES 6 to 9, it will be seen that the stacking shoulders 106 and 111 of carton ends 105 and 110 project upwardly above the upper edges 121 and 122 of side walls 118 and 119. This permits the cartons to be stacked, as illustrated in FIGURE 9. The lower

ends of the end walls of each carton in the stack rest on the shoulders 106 and 111 of the carton beneath it. This provides air spaces 125 between the tops of the main bodies of the cartons and the bottoms of the cartons immediately above them. Thus, the load is actually taken by the laminated vertical supports that constitute the carton ends.

If the cartons are intended for comparatively light loads, cross bracing flaps 38 and 67 may be omitted. In this case, the inner side wall panels retain the inner end panel in position since the former overlaps the latter. However, the carton is greatly improved by the cross bracing flaps. Similarly, the friction tabs of the inner and intermediate end panels may be omitted, but far better results are obtained when these tabs are present.

What I claim as my invention is:

1. An open top stacking split bottom carton including opposed three ply end walls having horizontal top and bottom edges, opposed two ply side walls and a single ply engaged split flap closure bottom, the side and end walls being foldably connected along their respective vertical side edges and disposed in tubular relation, said end walls being higher than the side walls to provide stacking shoulders upon which successive cartons are supported, said shoulders supporting the containers only at the ends and the split bottom of the container being totally unsupported in such stacked relationship, each end wall comprising an outer panel hingedly connected to the adjacent ends of the side walls, an inner panel connected by a substantially horizontal spacer strip to the upper horizontal edge of the outer panel, said spacer strip serving as a support for successive cartons in stacked relationship, and an intermediate panel connected by a substantially horizontal spacer strip to the lower horizontal edge of the outer panel, said second spacer strip being narrower than the first spacer strip, the intermediate panel extending upwardly between the inner and outer panels, said panels extending substantially the height of the end wall and forming thereby a three ply vertical end construction terminating at the upper edge of said wall in a stacking shoulder of sufficient strength to support successive cartons without deformation of said end walls

and a split bottom comprising only two outer bottom flaps each connected to and extending inwardly from the bottom horizontal edges of the side walls, the bottom flaps each having terminal edges and means locking said bottom flaps together, the terminal edges of said bottom flaps overlapping to the extent only of the length of said locking means, each side wall including an outer side panel connected at its ends to the outer end panels, an inner side panel connected at its upper edge only by a narrow spacer strip to the upper edge of the outer side panel, and inner reinforcing bottom flaps connected to the lower edge of the inner side panels and extending inwardly over the outer bottom flaps, the inner bottom flaps being substantially in free edgewise abutting relation along the container midwidth, and a bracing flap connected to the lower horizontal edge of each inner end panel and projecting inwardly between the upper and lower bottom flaps to brace said reinforcing bottom flaps adjacent each end of the carton.

2. A stacking carton as claimed in claim 1 including foldable friction tabs on each side edge of each inner end panel and intermediate end panel extending inwardly therefrom and frictionally engaging the adjacent outer side panel, said friction tabs extending substantially the height of the side walls and extending between the outer and inner panels thereof to maintain the inner end panel and intermediate end panel in vertical relationship.

3. A stacking carton as claimed in claim 1 wherein a locking tab is provided adjacent the marginal edge of the inner end panel, said tab being struck from the bracing flap integral with said marginal edge, and in locking engagement with the terminal side edges of said inner bottom reinforcing flap.

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