

May 15, 1962

V. E. SWANSON

3,034,696

EGG CARTON

Filed Sept. 30, 1960

3 Sheets-Sheet 1

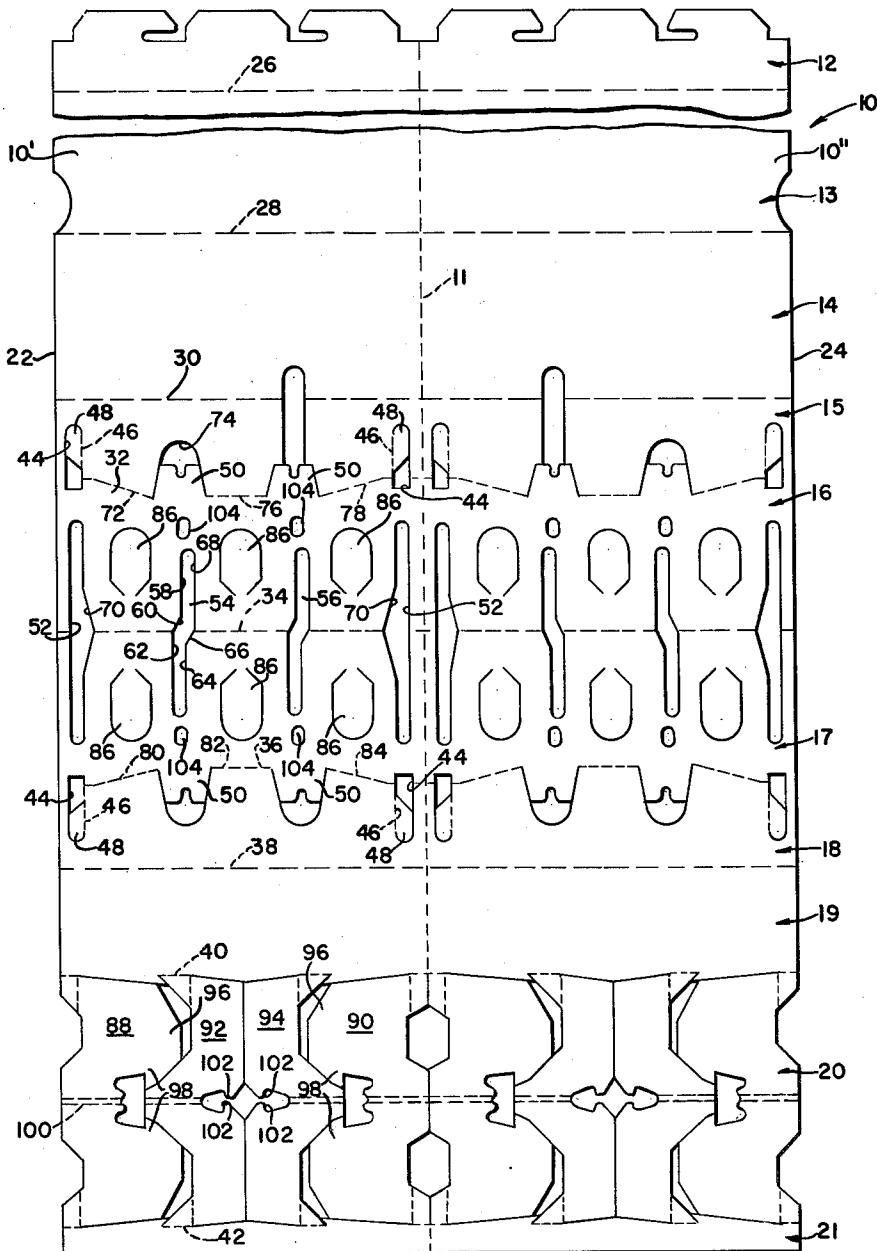


FIG. I.

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3 Sheets-Sheet 2

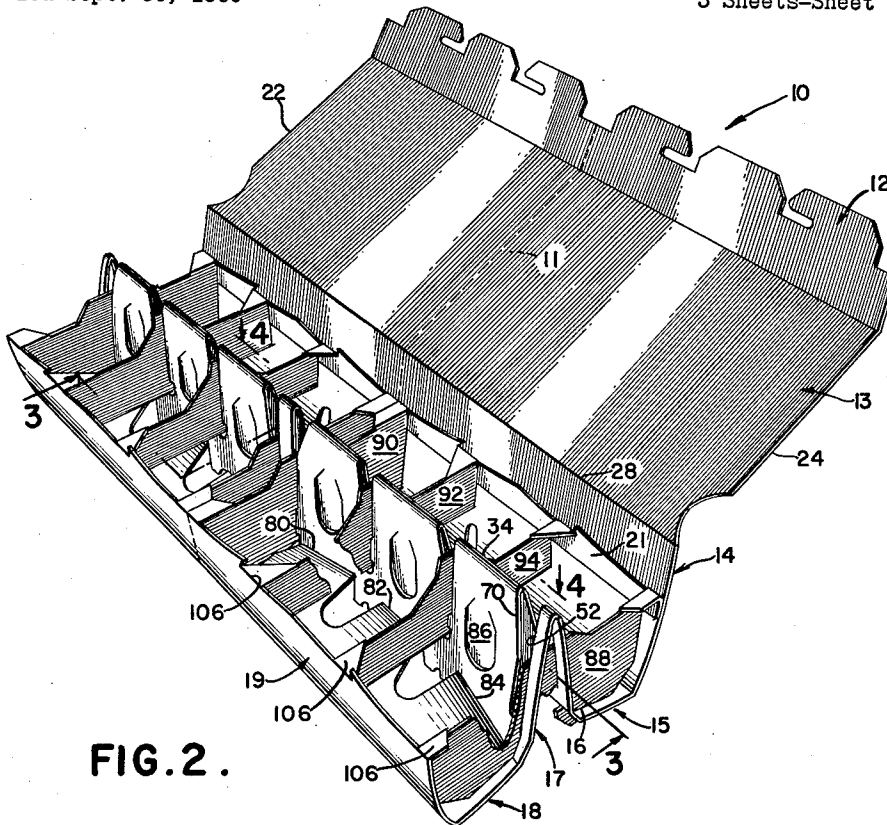


FIG. 2.

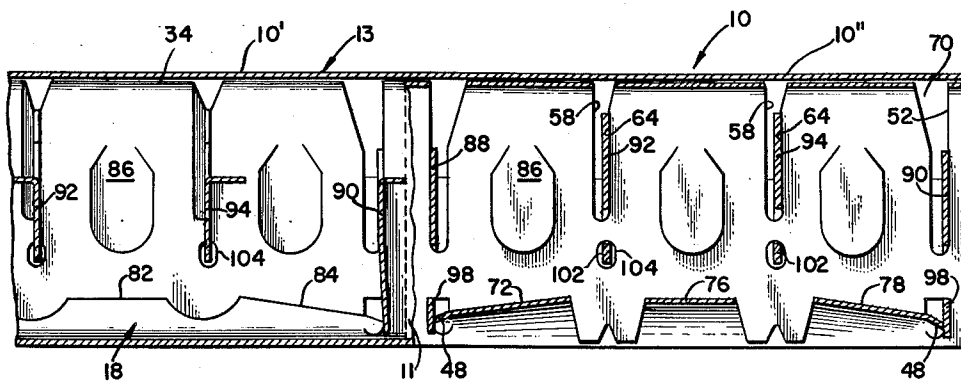


FIG. 3.

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3 Sheets-Sheet 3

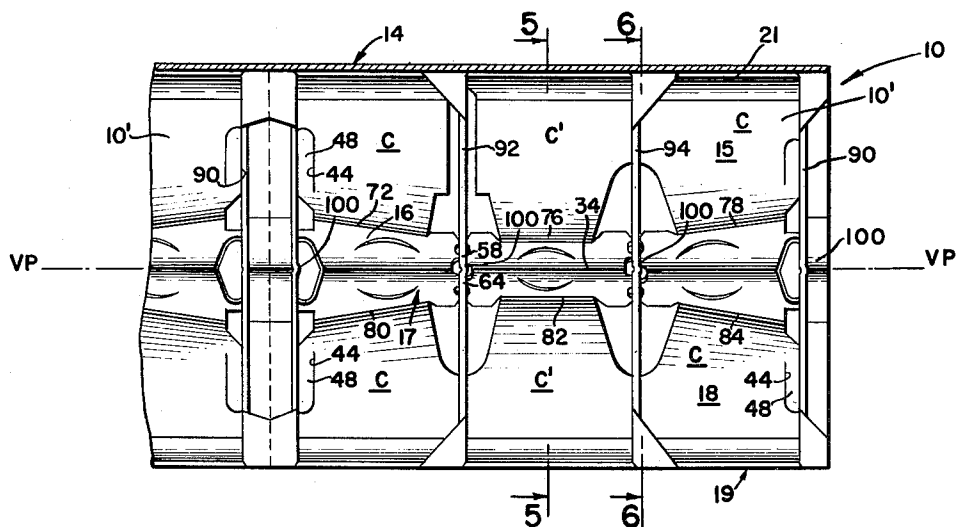


FIG. 4.

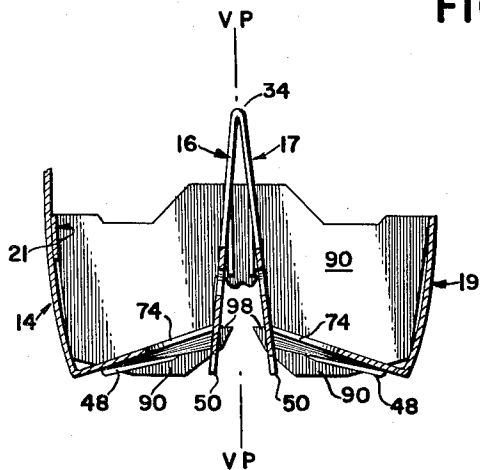


FIG. 6.

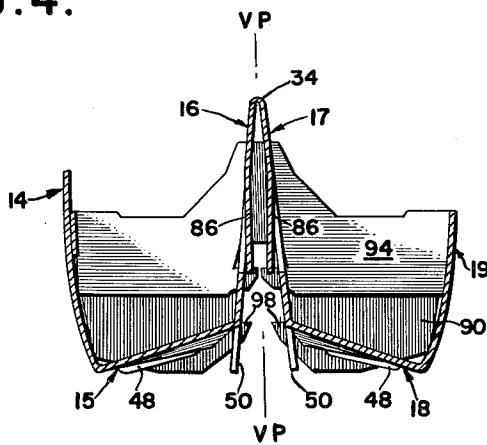


FIG. 5.

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EGG CARTON

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2 Claims. (Cl. 229-28)

The present invention relates generally to one-piece paperboard egg cartons, and more particularly to an improved egg carton which includes a high longitudinal central partition affording improved protection and space for the contents of the carton.

Egg cartons of the character involved have generally been erected on automatic machinery, such as that disclosed in United States Letters Patent to Jordan No. 2,700,922 issued February 1, 1955.

Egg cartons have generally been constructed in the form of a rather narrow, hollow, rectangular box, including two longitudinal rows of six egg receiving cells, and although various variations have been proposed, the style known as an inverted V bottom comprising a longitudinal central partition including two plies of material integrally joined at their apex and diverging downwardly and outwardly from the apex to integrally join the bottom structure of the carton has been found to be an acceptable and satisfactory construction.

The art has indicated that the inverted V bottom style egg carton required a minimum of paperboard material, and thus, there has been a constant attempt to improve this type of carton. A typical carton of the character involved is that disclosed in United States Letters Patent to Reifers No. 2,873,059 issued February 10, 1959, it being noted that the longitudinal partition of this carton did not extend through the entire depth of the carton to provide an abutment for the undersurface of the cover of the carton.

In order to protect eggs disposed in adjacent cells of a carton having a longitudinally extending partition, it was found highly desirable to prevent the central partition from having lateral movement with respect to the central longitudinal plane of the carton, i.e., movement toward and away from the front and back walls of the carton. Further, it was found desirable to have the longitudinal partition extend substantially the entire depth of the carton to provide an abutment between the cover of the carton, thus protecting eggs when cartons are stacked one upon the other. In addition, it was found that although a two-ply central partition was desirable, the closer the plies could be disposed with respect to each other, the greater the capacity of the egg cells, i.e., for the purpose of accommodating the largest sized eggs.

A primary object of the present invention is to provide an improved egg carton constructed from a one-piece paperboard blank which affords improved stability to the longitudinal partition of the carton and yet permits the longitudinal partition to extend the entire depth of the carton.

Another object of the invention is to provide in an egg carton constructed from a single blank of paperboard means whereby eggs contained in cells of the cartons are substantially protected on all sides from jostling, in addition to providing rigidity heretofore not thought possible and yet not involving additional material or increase in size of the basic blank from which the egg carton is erected.

Other objects and the nature and advantages of the instant invention will be apparent from the following description taken in conjunction with the accompanying drawings wherein:

FIG. 1 is a plan view of a blank for the novel egg carton of the present invention;

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FIG. 2 is a perspective view of the novel carton, portions being broken away for purposes of clarity, and the lid of the carton being in an open position;

FIG. 3 is a longitudinal section taken substantially on line 3-3 of FIG. 2, the lid of the carton being shown in the position assumed when the carton is closed;

FIG. 4 is a fragmentary enlarged top plan view looking substantially from the plane indicated by line 4-4 of FIG. 2, showing the general appearance of the longitudinal partition of the novel carton;

FIG. 5 is a vertical section taken substantially on line 5-5 of FIG. 4; and

FIG. 6 is a vertical section taken substantially on line 6-6 of FIG. 4.

Referring to the drawings in detail, like reference characters are used to designate like or corresponding parts throughout the several views. Indicated generally at 10 in FIG. 1 is a blank comprising two symmetrical halves 10' and 10'' which may be separated by a longitudinally extending perforated tear line 11 as is conventional in the art. Inasmuch as the two halves 10' and 10'' are identical, only one will be described in detail. The blank 10, when erected, will provide two separable six cell units. The blank 10 comprises, in order, a top flap 12, a cover panel 13, a back panel 14, a bottom panel 15, a pair of longitudinal partition panels 16 and 17, a second bottom panel 18, a front panel 19, a cross partition panel 20 and a glue flap 21. As is conventional, the solid lines represent cuts and margins, and the dotted lines represent score lines or folds.

The blank includes lateral side edges or margins 22 and 24, normal to a plurality of transversely extending fold lines defining margins of the panels in the order named. The first fold line 26 defines the margin between the top flap and cover panel 12 and 13, respectively. The second fold line 28 defines the margin between the cover panel 13 and back wall 14. The fold line 30 defines the margin between the back wall 14 and the bottom panel 15. The fold line 32 defines the margin between the bottom panel 15 and the longitudinal partition panel 16. The fold line 34 defines the margin between the adjacent pair of longitudinal partition panels 16 and 17. The fold line 36 defines the margin between the longitudinal partition panel 17 and the second bottom wall panel 18. The fold line 38 defines the margin between the bottom wall panel 18 and the front wall panel 19. The fold line 40 defines the margin between the front wall panel 19 and the cross partition panel 20. And the fold line 42 defines the margin between the cross partition panel 20 and the glue flap 21.

Now referring to the blank section 10', the bottom panels 15 and 18 include a pair of transverse slots 44 disposed adjacent to and inwardly of the side margin 22 and perforated line 11. Hingedly connected at 46 to the respective bottom walls 15 and 18 and disposed in slots 44 are displaceable tabs 48, the function of which will become apparent during the description of the erected carton. Each of the bottom panels 15 and 18 have severed therefrom spaced foot lugs 50 which are separated on three sides and integrally joined to the adjacent longitudinal partition panels 16 or 17.

The blank portion 10' has extending transversely therethrough, inwardly of and substantially parallel to the margin 22 and perforated line 11, elongated slots 52 disposed substantially symmetrical and normal to the fold line 34. The slots 52 terminate short of the fold lines 32 and 36. The partition panels 16 and 17 have extending transversely therethrough and intermediately of the slots 52 a pair of intermediate slots 54 and 56. The slots 54 and 56 are identical in configuration, and each is defined by a marginal edge 58 angling at 60 to the fold line 34 and continuing in the same general di-

rection in the partition panel 17 in an offset marginal edge 62 which is connected to a marginal edge 64 substantially colinear with the first margin 58. The marginal edge 64 angles at 66 toward the fold line 34 and then continues in a marginal edge 68 offset from the marginal edge 64. When the carton is erected, the substantially colinear marginal edges 58 and 64 will wedgedly engage a transversely disposed cross partition panel element which will extend into the slot 54 or 56. The angled portions 60 and 66 will define a substantially wide mouth to facilitate the ready receipt of cross partition panel elements into the slots as the carton is being erected. Likewise, it will be noted that the slots 52, the end slots, also diverge inwardly at 70 to form a substantially open throat to receive a transverse cross partition panel element.

It will be noted that portions of the fold lines 32 and 36 in the respective panel sections 10' and 10'' are not in parallel relationship to the fold line 34 which will define the apex between the longitudinal partition panels 16 and 17. Fold line 32 includes, reading from the margin 22 toward the perforated line 11, a first segmental fold line portion 72 which extends from one marginal edge of the slot 44 angularly toward the fold line 34 terminating at the cut line 74 which forms one of the feet 50. The intermediate segmental fold line portion 76 extends from the cut line 74 forming the other side of one of the feet 50 substantially parallel to the fold line 34 and terminates at the base of the other foot 50. The next segmental fold line portion 78 extends from the right hand foot 50, seen at FIG. 1, angularly away from the fold line 34 and terminates in the slot 44 adjacent the perforated line 11. Likewise, the fold line 36 includes a segmental fold line portion 80 extending angularly from a slot 44 toward the fold line 34 and terminates at the base of one of the feet 50. The next intermediate segmental fold line portion 82 extends parallel to the fold line 34, and the remaining segmental fold line portion 84 is in angular relationship to the fold line 34 extending between the slot 44 adjacent the perforated line 11 and the base of the right hand foot 50 viewed in FIG. 1.

The segmental fold line portions 32, 78, 80 and 84, in conjunction with the segmental fold line portions 76 and 82 in the erected carton, will provide a longitudinal partition comprised of partition panels 16 and 17 which will tend to fold out of a vertical plane passing through the apex, i.e. the fold line 34 of the longitudinal partition. This expedient, in conjunction with the co-linear marginal lines 58 and 64, which will engage the partition elements of the cross partition panel, will stabilize the longitudinal partition of the egg carton. Additionally, through these expedients, although the partition panel portions 16 and 17 will diverge from the apex at the fold line 34, the angle will be relatively slight, to provide a relatively wide bottom for the egg cells to accommodate relatively large sized eggs therein.

Additionally, the partition panels 16 and 17 include transversely spaced cut out abutment flaps 86 which will be displaced when relatively large sized eggs are disposed in the egg cells, further increasing the size of the respective egg cells.

The cross partition panel 20 comprises a pair of full depth cross partitioned elements 88 and 90 extending inwardly from the side margin 22 and perforated line 11 and a pair of shallow depth cross partition elements 92 and 94 therebetween. The full depth cross partition elements 88 and 90 each includes a pair of spaced extensions 96, these extensions 96 including opposed hooks 98 thereon. It will be noted that the cross partition panel has extending transversely therethrough a raised or embossed fold line 100 which will be disposed substantially at the co-linear margins 58 and 64 in the erected carton to further aid in the stabilization of the same. The shallow depth partition panel elements 92 and 94 include in-

wardly directed hook portions 102 which will engage in elongated apertures 104 extending transversely through the partition panel elements 16 and 17 at opposite ends of the slots 54 and 56.

Referring now to FIG. 2, there will be seen a perspective view of a carton erected from the blank 10 as shown at FIG. 1. The carton is also indicated generally at 10 and the cover has been folded back for purposes of clarity. The carton includes a front wall 19, a back wall 14, and bottom panels 15 and 18 separated by an intermediate transversely extending longitudinal partition panel including partition panels 16 and 17. The top flap 12 will engage hinge forming portions 106 adjacent the front wall 19 as is conventional in the art. The glue flap indicated at 21 will be secured in juxtaposition on the inner surface of the back wall 14 below the fold line 28. It will be noted upon considering the fold line 34 which defines the apex of the longitudinal or central partition formed by the partition panels 16 and 17, that the segmental fold lines 80 and 84 extend in downward angular relationship relative to a vertical plane which would pass through this apex. This vertical plane is indicated at phantom line VP in FIGS. 4-6.

It will be noted in FIGS. 2-6, that the bottom panels slope gently away from the lowermost portion of longitudinal partition panels 16 and 17. Further, it will be noted that the segmental fold lines 72-84 provide an irregular fold line with respect to the fold line 34, or the previously mentioned vertical plane. Eggs contained in opposed cells CC, as seen in FIG. 4 for example, when strikingly engaging adjacent portions of the longitudinally extending partition panels, would tend to move this partition panel angularly with respect to the vertical plane extending through the fold line 34. This angular relationship urges the longitudinal partition panel out of line with respect to the vertical plane which is the normal direction of folding of conventional partition panels. The resultant force reacting on the partition panels is thus considerably less than that which would react on the partition panels if the fold lines at the base of the partition panels were all parallel to the fold line 34. Although the segmental fold lines 76 and 82 are parallel to the fold line 34, see FIG. 4, for example, the angularly related fold lines 72, 80 and 78, 84 on opposite sides thereof, aid to rigidify the partition panel portion forming the intermediate egg cells C'C'. Further, the colinear marginal portions of slots 54, 56, see 58 and 64 in FIG. 4, will engage opposite sides of the cross partition panel elements 92 and 94, further stabilizing the longitudinal partition panels against relative movement transversely thereof. The embossed fold line 100 formed in the cross partition panel will likewise aid to prevent relative transverse movement of the longitudinal partition panels 16 and 17 with respect to the cross partition panel elements 88-90.

It will be noted that the feet 50, formed integrally with the partition panels 16 and 17, will terminate substantially in alignment with or co-planar with the bottoms of the cross partition panel elements 88 and 90, see FIG. 6, and the lowermost portion of the front and rear walls 14 and 19 to provide a substantially solid base for the erected carton. Still further, as seen in FIG. 3, for example, the cover panel will be disposed in substantially abutting relationship at the apex of the longitudinal partition and when another carton is stacked thereupon, the force thereof will be transmitted through the longitudinal partition directly to the feet 50 and base of the carton.

It will be observed in FIG. 4, that the end cells CC have an intermediate longitudinal partition, the base of which being indicated at fold line 72, 80, and 78, 84, respectively, which tends to angle eggs contained therein inwardly away from the carton ends and toward the intermediate opposed cells C'C'.

The manner in which the carton is erected on automatic machinery is clearly disclosed in the previously

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mentioned Patent No. 2,700,922. The blank is formed as a flattened tube, the machinery first expands the tube, then rotates the cross partition panel elements 38—94 normal to their general plane, and finally “tops” the inverted V bottom longitudinal partition panels 16, 17 or moved upwardly into locking engagement with the portions 98 and 102 of the cross partition panel. It will be noted that the portions 98 will engage in the slots 44 formed in the bottom panels 15 and 18, and the hooks 102 will engage in the slots 104 in the partition panels 16 and 17. Reference characters have been applied on FIGS. 2-6 illustrating the manner in which these various hook portions function.

Thus, there has been disclosed and described an egg carton affording superior protection and separation between adjacent egg cells, especially between the front row and longitudinal rows thereof. The blank includes slot and hook portions facilitating the ready erection of the carton by means of automatic machinery. Further, the carton includes a longitudinal partition wherein segmental fold lines disposed in angular relationship to the vertical plane passing the apex of the longitudinal partition causes or results in buttressing of this longitudinal partition inasmuch as the force of eggs being shipped within the carton tends to make the partition fold out of its normal plane of folding. Still further, the angular relationship of the segmental fold lines tends to urge eggs contained within the egg cells into the carton away from the outer or side walls thereof to further protect the eggs from exterior forces on the egg carton.

It will be obvious to those skilled in the art that various changes may be made without departing from the spirit of the invention and therefore the invention is not intended to be limited to what is shown in the drawings and described in the specification but only as indicated in the appended claims.

What is claimed is:

1. In a carton erected from a single blank and comprising individual cells formed by opposed front and rear walls, transverse partition elements, bottom walls, and a longitudinally extending central partition generally parallel to said front and rear walls, said central partition comprising a plurality of cell forming portions including pairs of downwardly diverging panels joined at an upper edge

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coincident with a vertical plane extending through the longitudinal axis of said carton, said bottom walls extending inwardly from lower edges of said front and rear walls and each being joined to the lower edge of said central partition panels on segmented linear fold lines in each of said cells and spaced from said vertical plane and disposed below said upper edge, the segmental fold lines of one pair of opposed cells being disposed parallel to each other and said vertical plane, and the segmental fold lines of a next adjacent pair of cells being disposed in angular relation with respect to each other and said vertical plane and extending uniformly from the segmental fold lines of said first-mentioned pair of opposed cells.

2. In a rectangular blank for a paperboard carton, a pair of immediately adjacent longitudinal central partition panels having a central fold line therebetween normal to lateral side margins of said blank, a pair of bottom panels foldably connected to said central partition panels opposite said central fold line, said bottom panels being connected to said partition panels on segmental, linear fold lines disposed in laterally spaced relation from and along said central fold line, front and rear panels connected to said bottom panels, and a transverse partition panel foldably connected to said front panel and including a glue flap at the marginal edge thereof, said transverse partition panel including individual, displaceable cell forming partition elements therein, said central partition panels including elongated slots normal to said central fold line for receiving a partition element therein when the blank is erected, said segmental fold lines being disposed in opposed pairs converging angularly and uniformly inwardly from opposite side margins of said blank and being longitudinally spaced from an intermediate pair of said segmental fold lines disposed parallel to and spaced from said central fold line.

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