May 29, 1951 M. BURGER 2,554,613

CELLULAR CARTON

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Fig. 1

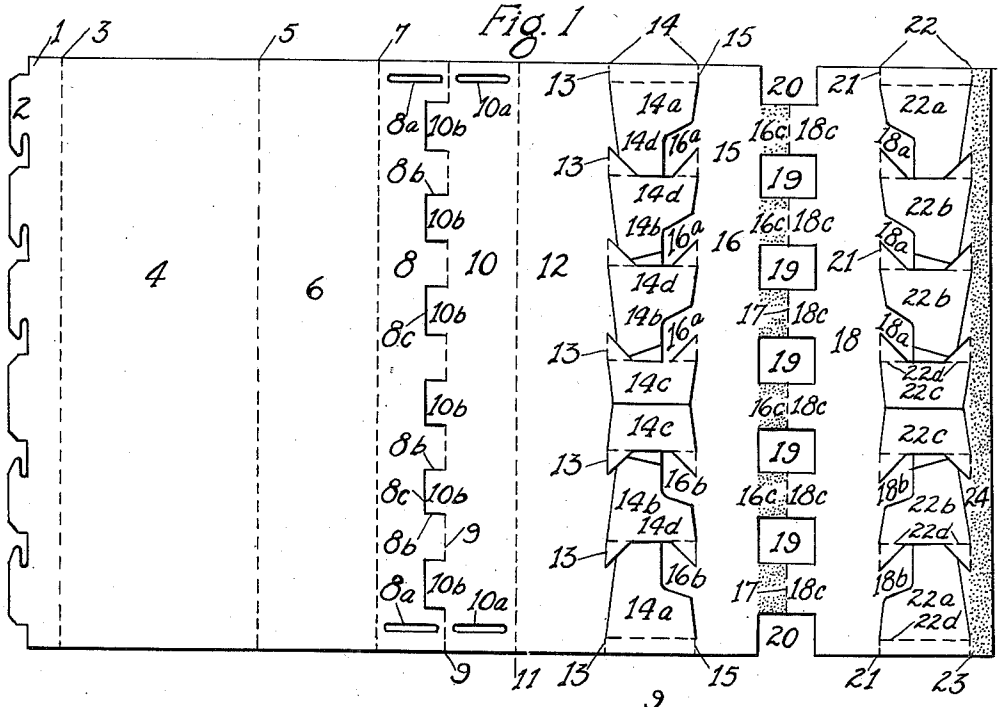
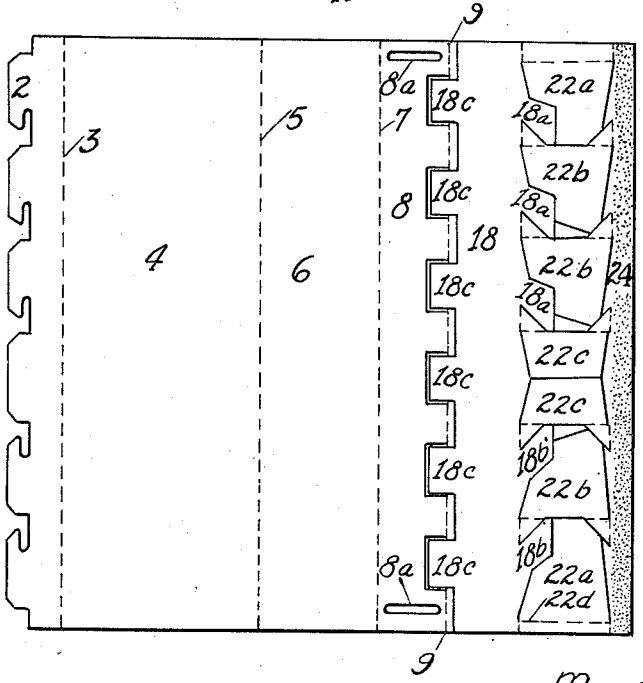


Fig. 2



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Fig. 3

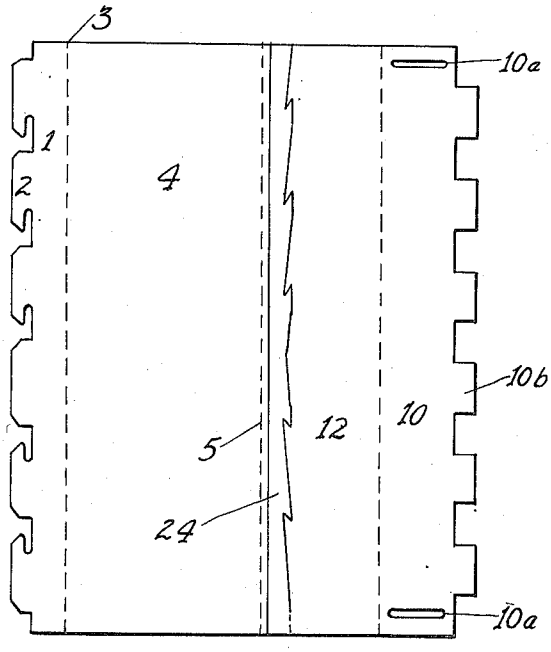


Fig. 4

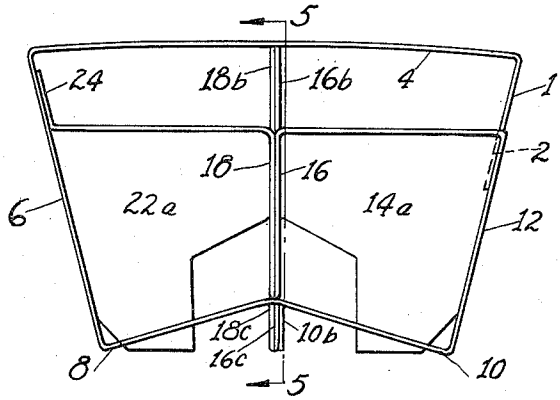
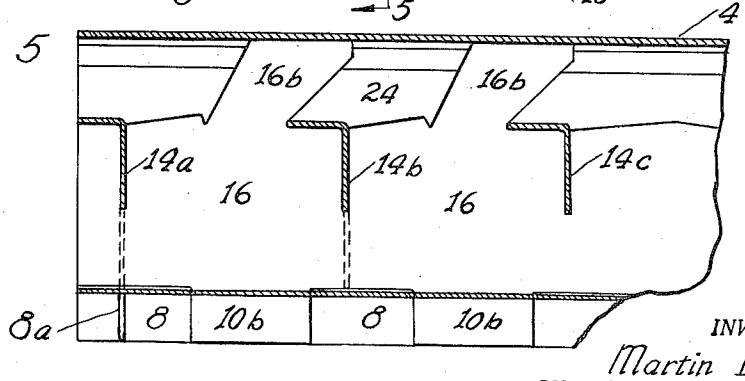


Fig. 5



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Fig. 6

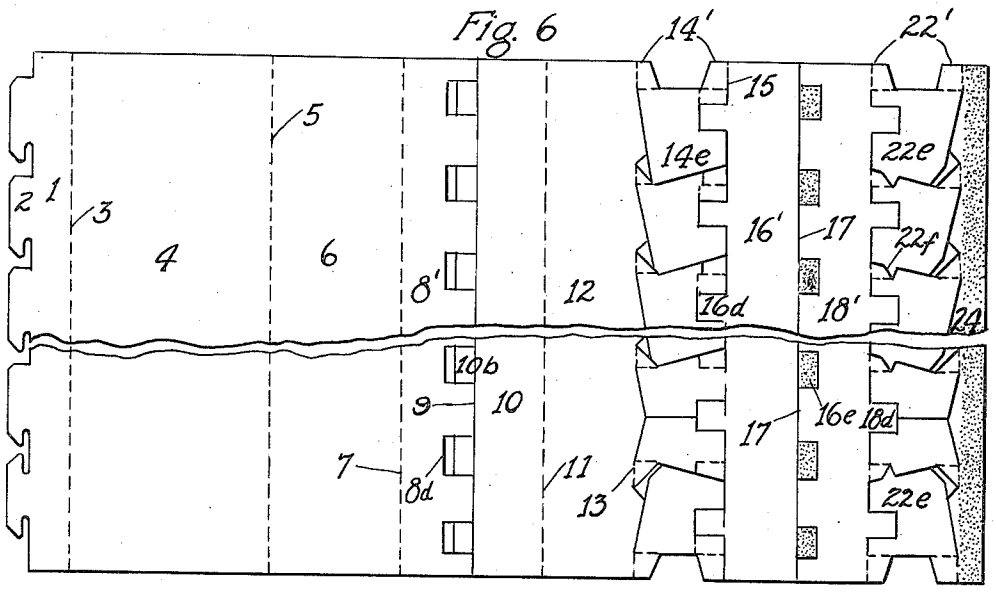


Fig. 7

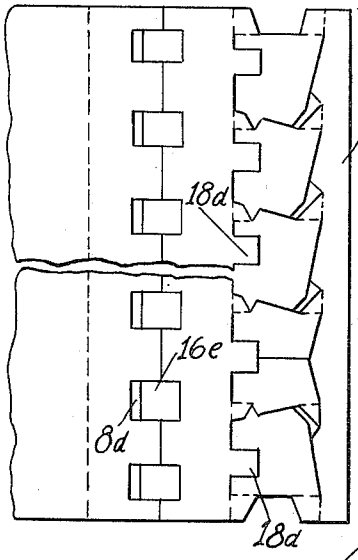


Fig. 8

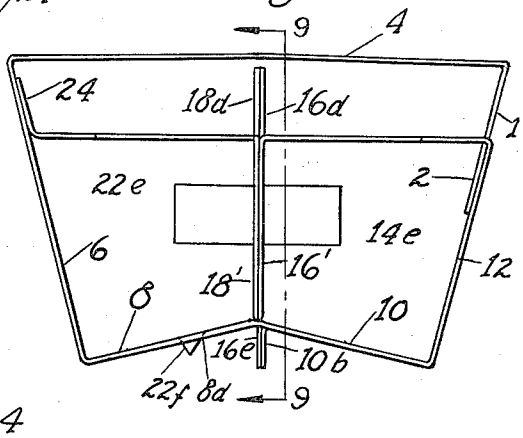
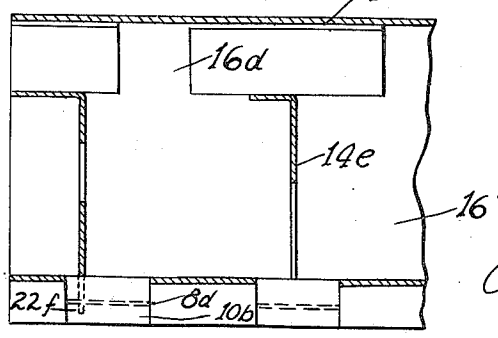


Fig. 9



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Patented May 29, 1951

2,554,613

UNITED STATES PATENT OFFICE

2,554,613

CELLULAR CARTON

Martin Burger, Morris, Ill., assignor, by mesne assignments, to Shellmar Products Corporation, Chicago, Ill., a corporation of Delaware

Application July 28, 1945, Serial No. 607,596

14 Claims. (Cl. 229—28)

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This invention relates to an improved type of carton for fragile articles, in particular, eggs.

Its object is to provide a carton which is of unitary or one-piece construction; a carton which may be easily manufactured; which possesses great resistance to crushing pressures; which is foldable for shipment in a knock-down condition and which may be easily set up for use, particularly by hand.

Other and further objects will be apparent from the detailed description which follows and by reference to the drawings in which:

Fig. 1 is a plan view of the single die cut blank from which the carton is formed;

Fig. 2 is a plan view of the blank shown in Fig. 1 following folding in one step of the manufacture of the carton;

Fig. 3 is a plan view of the fully fabricated carton, knocked down, in the form in which it is shipped to users;

Fig. 4 is an end view of the carton fully set up and closed;

Fig. 5 is a fragmentary cross sectional view taken substantially on the line 5—5 of Fig. 4;

Fig. 6 is a fragmentary plan view of a flat blank illustrating a modified form of the invention;

Fig. 7 is a fragmentary view, similar to Fig. 2, showing the blank shown on Fig. 6 following folding in one step of the manufacture of the carton;

Fig. 8 is an end view of a carton formed from the blank shown in Fig. 6; and

Fig. 9 is a fragmentary cross sectional view taken substantially along the line 9—9 of Fig. 8.

As shown in the drawings, in the embodiment of Figs. 1–5 inclusive, and with particular reference to Fig. 1, the carton is formed from a flat blank of a suitable cardboard stock, die cut and scored or creased to provide a panel 1 carrying conventional lock tabs 2, which panel 1 is integrally connected along a score line 3 to a further cover forming panel 4. Cover 4 is integrally connected along a score line 5 to a panel forming a rear side wall forming panel 6, which in turn is integrally connected along a score line 7 to a panel comprising one bottom section 8. A plurality of spaced parallel slots 8a are provided in bottom section 8, at least adjacent the sides of the blank, substantially as shown.

A plurality of spaced, aligned score lines 9 define an integral foldable connection of bottom section 8 with another bottom section 10, the latter having a plurality of spaced extensions 10b formed integrally therewith. Extensions 10b are cut out of the material of bottom section 8 being

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defined by a plurality of parallel slits 8b extending from score lines 9 transversely of bottom section 8 into intersection with opposite ends of the spaced aligned slits 8c, so as to connect slits 8b in pairs. A plurality of spaced parallel slots 10a, similar to slots 8a in section 8 and aligned therewith, are provided in bottom section 10.

A score line 11 defines a line of fold and integral connection between bottom section 10 and front side wall 12 which is connected along spaced aligned short score lines 13 to a front transverse partition panel 14. A plurality of transverse partitions 14a, 14b and 14c are cut out of the material of panel 14 along the heavier lines delineated therein, each partition being foldable on spaced transversely extending score lines 14d from coplanar to spaced, vertical, cell defining positions when the carton is erected.

As shown on the drawings transverse partitions 14a, formed at opposite sides of the blank, are of substantially the same size and are longer than the other partitions; partitions 14b are substantially identical to one another but shorter than partitions 14a, and partitions 14c are substantially identical to one another but shorter than partitions 14b.

A plurality of spaced aligned short score lines 15 define a line of hinged connection between front transverse partition panel 14 and another panel 16 which constitutes one side of a longitudinal two walled partition in the erected carton and which has formed integral therewith a plurality of spaced outwardly extending leg portions 16a and 16b. These portions as shown, extend angularly with respect to longitudinal partition panel 16 and some thereof, such as 16b, extend oppositely to others thereof, such as 16a. Also formed integral with partition side 16 are a plurality of extensions 16c extending oppositely of leg portions 16a, 16b, which will be more fully described hereinafter.

A plurality of spaced, aligned score lines 17 define a line of fold and integral connection between longitudinal side 16 and a panel 18 adapted to form the other wall of the above mentioned two walled longitudinal partition. Like longitudinal partition panel 16, partition panel 18 has formed integral therewith a plurality of spaced angularly extending leg portions 18a and 18b similar to portions 16a, 16b. Also formed integral with panel 18 are a plurality of extensions 18c, similar to portions 16c.

A plurality of preferably rectangular openings 19 in spaced aligned relation in the body of the blank, and two three sided openings 20 at the

edges of the blank, all cut equally from the material of longitudinal partition sides 16 and 18 in the transverse dimension thereof, serve to outline leg portions 16c, 18c, which are divided medially by the score line 17.

Spaced aligned score lines 21 provide a line of fold an integral connection between partition side 18 and a panel 22, identical to panel 14, and a series of transverse partitions 22a, 22b and 22c are cut out of the material of panel 22 along the heavier lines delineated therein. Each partition is foldable on spaced transversely extending score lines 22d from co-planar to spaced vertical cell defining positions when the carton is erected. Transverse partitions 22a, 22b and 22c are identical, respectively, to transverse partitions 14a, 14b and 14c.

A plurality of spaced, aligned score lines 23 similar to lines 21 delineate a line of fold and integral connection between panel 22 and a conventional attaching strip 24.

As shown in Fig. 2, after the blank has been scored and cut as hereinbefore indicated, it is fabricated by first folding the blank back upon itself along score lines 13 in the direction of score line 9, then reversing the transverse partition bearing end of the blank back upon itself along score lines 17. When this double fold has been accomplished the blank will appear as shown in the above mentioned figure. It will be noted that in this position of the parts longitudinal partition panels 16 and 18 fall into exact register as also do their integral parts 16a and 18a, 16b, and 18b, and 16c and 18c. In the thus folded condition of the blank it will also be noted that the now double folded extensions 16c, 18c fall into register with and are of about the same size as extensions 10b in bottom section 10 and which are cut out along three sides by cuts 8b, 8c from the material of bottom section 8.

In the fabrication of the carton and approximately coincident with the above noted folding operation suitable fastening means, such as an adhesive is applied along portions 16c as shown in Fig. 1, and also along at least portions of longitudinal partition panels 16 and 18 on their sides opposite those shown in Fig. 1. This having been accomplished, extensions 16c adhere to extensions 10b with which they abuttingly register, and longitudinal partition panels 16 and 18 adhere together in back to back relation to constitute a double thickness longitudinal partition.

In the next step of the fabrication operation adhesive or other suitable fastening means is applied to attaching strip 24 as shown in Fig. 1, and this portion folded angularly slightly along score lines 23. The portion of the blank comprising back side wall 6 is then folded over along score lines 9 to the extent that the adhesive bearing face of attaching strip 24 comes into full contact with rear side wall 6 in the area adjacent end parallel to score line 5, as in Fig. 3. The carton is thus completely formed, appearing in fully flattened condition as shown in Fig. 3.

The foregoing description has been specifically directed to the showing of Figs. 1 to 5, inclusive, of the drawings. Referring now to Figs. 6 to 9 inclusive, there is shown therein a modification which, detailedly analyzed, involves slight changes from the previously disclosed forms in the formation of bottom section 8'; in the specific forms of transverse partitions in panels 14' and 22'; and in the form of panels 16' and 18', which fold into back to back relation and are retained

to form the longitudinal partition separating the adjacent rows of cells.

More specifically, in this form, at least panel 8' is provided with a plurality of spaced, aligned apertures 8d, as shown, one lateral edge of which is parallel to the side edges of the blank. These apertures are so located in the blank as to receive and retain in upright position some of the transverse partitions of the erected carton in manner more fully hereinafter set forth.

Although not shown, it will be obvious that identically positioned apertures may be provided in panel 18', should it be found desirable so to do, these to perform an identical function to apertures 8d.

As shown in Fig. 6, the major portions of the transverse partitions formed from panels 14' and 22', and typically illustrated by partitions bearing reference numerals 14e and 22e, are relatively wide throughout their length, tending generally to fill the spaces between the longitudinal partition sides 16', 18' and front and rear walls, of the erected carton 12 and 6, respectively as particularly shown in Fig. 8. In the form shown, certain of the transverse partitions are provided with end extension tabs, typically illustrated by numeral 22f, which, in the erected carton enter and are frictionally engaged in apertures 8d of the bottom panel.

The two panels 16', 18', adapted to fold into back to back relation to form the two ply longitudinal partition, are each provided with leg extensions 16d and 18d, these cut out of the material of panels 14' and 22', and here shown as being cut out parallel with the longitudinal dimension of the blank, and being adapted to meet in back to back relation in the erected carton to form the cover supporting portions particularly shown in Figs. 8 and 9.

Unlike the showing of Figs. 1–5, panels 16', 18' differ from one another along their line of interconnection in that there is formed integral with panel 16' the extension portions 16e, which are cut out of the material of panel 18'. This construction makes for a savings in paper stock over the form shown in Fig. 1.

This modified form of carton is fabricated and set up in manner substantially identical to the other form shown in the drawings.

In the manufacturing operation, after the blank is cut out to the form shown in Fig. 6, it is fabricated by folding the blank back upon itself along score lines 13 in the direction of score line 9. The blank is then reversed upon itself by folding along score lines 17. When this is accomplished the blank will appear substantially as indicated in Fig. 7. It will be noted that thus folded, longitudinal partition sides 16', 18', and in particular portions 16e and 10b, fall into register. Adhesive or the like is applied to the abutting registering portions to hold them in fixed relation to one another, and the final step of fabrication is that of securing attaching strip 24 to rear side wall 6 below and parallel to score line 5.

Thus fabricated, the carton is shipped flat, substantially in the form shown in Fig. 3.

To set the carton up by hand from the folded form shown in Fig. 3 the carton is grasped in one hand along front and rear side walls 6 and 12 and the triple ply downwardly extending longitudinal rib members 10b, 16c, 18c is forced upwardly until bottom portions 8 and 10 assume approximately that position shown in Fig. 4.

Cover 4 being as yet still open and extending in alignment with rear side wall 6, partition

panels 14 and 22 will be seen to extend horizontally of the carton. Then transverse partitions 14a and 22a, 14b and 22b, 14c and 22c are bent downwardly in succession by the operator, using two fingers, along score lines 14d and 22d, respectively, until all the transverse partitions are swung from co-planar horizontal to spaced vertical positions, forming a plurality of article receiving compartments.

The cover 4 may then be folded down along score line 5 into covering relation to the compartment, cover locking strip 1 being folded along score line 3 into substantial alignment with front side wall 12 and the cover biased slightly so that locks 2 engage the gussets forming hinges adjacent the top of front wall 12.

As shown in Fig. 4 there is provided a carton having transverse partitions at least some of which extend through the bottom sections, the carton being divided lengthwise by a two ply longitudinal partition, and each of said transverse partitions being hinged to an adjacent wall and to the longitudinal partition, and having upwardly disposed extensions providing a two ply support for the cover. There is also provided a plurality of spaced downwardly extending multi-ply ribs or supports which assist in maintaining the carton in cushion forming position.

It is desired to specifically point out that in all the forms herein shown the arrangement of the transverse partitions in their relation to their cooperating parts is in accordance with the teaching of Cox U. S. Patent No. 2,037,502.

Having thus specifically described my invention, I do not wish to be limited to the exact forms shown, these being merely illustrative. other than as limited by the scope of the following claims.

I claim:

1. A carton comprising front and rear side walls, a bottom connecting the same and a multi-ply longitudinal partition subdividing the space between said walls into parallel rows, and transverse partition elements on either side of said partition hingedly connected to the front and rear walls respectively, and swingable from inoperative co-planar position to operative erected position at an angle to the bottom to thereby subdivide said rows into cells, said bottom having integral tabs extending at an angle thereto in erected condition of the carton and said longitudinal partition member having leg elements cut from the material thereof and extending immediately adjacent said tabs in said erected condition of the carton to assist in maintaining the bottom in cushion-forming position elevated above a surface on which the carton rests.

2. A carton comprising front and rear side walls, a bottom connecting the same and a multi-ply longitudinal partition subdividing the space between said walls into parallel rows, and transverse partition elements on either side of said partition hingedly connected to the front and rear walls respectively, and swingable from inoperative co-planar position to operative erected position at an angle to the bottom to thereby subdivide said rows into cells, said bottom having integral tabs extending at an angle thereto in erected condition of the carton and said longitudinal partition member having leg elements cut from the material thereof and secured in side-by-side relation to said tabs, whereby in said erected condition of the carton to assist in maintaining the bottom in cushion-forming position elevated above a surface on which the carton rests.

3. A carton comprising front and rear walls, a bottom connecting the same and a multi-ply longitudinal partition subdividing the space between said walls into parallel rows, and transverse partition elements on either side of said partition hingedly connected at their adjacent sides to the partition and at their remote sides to the front and rear walls, respectively, and swingable downwardly of the carton section from inoperative co-planar position to operative erected position at an angle to the bottom to thereby subdivide said rows into cells, said bottom being cut to define tabs hinged to the bottom and a series of apertures transversely aligned with said respective tabs, said longitudinal partition member having leg extensions excised from at least one of the plies thereof which are transversely aligned with and extend through said apertures in side-by-side relation with said tabs in the erected condition of the carton, to thereby afford multi-ply ribs assisting in maintaining the bottom in a cushion-forming position elevated at its center above a surface on which the carton rests.

4. A carton body comprising front and rear side walls and a pair of bottom sections joining the walls, at least one of the bottom sections having cut out portions forming upright tabs which are hinged to the carton adjacent the juncture of the bottom sections and extend downwardly therefrom, transverse partitions divided into rows by a longitudinal partition, and a longitudinal partition having portions formed thereon which extend through the openings caused by outward swinging of the tabs and which lie in fixed abutment with said tabs, thereby providing a plurality of multi-ply ribs adapted to assist in supporting the bottom sections, medially of the carton, above the level of the wall bottoms.

5. A carton body, comprising front and rear side walls, a pair of bottom sections integrally and directly connected to one another by a medial fold line joining the walls, at least one of the bottom sections having portions freed therefrom forming tabs hinged to the carton adjoining said fold line and swingable outwardly therefrom, a pair of transverse partition panels including a plurality of individual partitions swingable from co-planar horizontal to spaced upright positions, a downwardly looped multi-ply longitudinal partition, one ply of which has a plurality of leg extensions formed integral therewith, said leg extensions being cut out of the material of the other ply and extending through the openings caused by outward swinging of the tabs in the bottom section having the same, the extensions meeting in fixed surface abutment with the tabs and providing a plurality of multi-ply ribs adapted to assist in maintaining the bottom sections in cushion forming position adjacent their juncture.

6. A collapsible carton which, when erected, comprises front and rear side walls, a bottom connecting the walls and being bent into centrally raised position, a longitudinal partition, and a plurality of transverse partitions each being hinged to the longitudinal partition and to the most proximate wall, said partitions being swingable from co-planar horizontal to spaced upright positions and being so shaped and mounted as to wedgingly separate the portions to which they are attached when in the latter position, tabs excised from the bottom section and hinged thereto adjacent the apex thereof, leg elements formed on the longitudinal partition, said leg elements being inserted through the openings

resulting from displacement of the tabs and secured to the latter, thereby forming a plurality of downwardly extending multi-ply ribs, said ribs cooperating with the upright transverse partitions to maintain the carton in erected and medially elevated condition.

7. A collapsible carton comprising front and rear side walls connected by a bottom section medially elevated above the level of the wall bottoms, a multi-ply longitudinal partition having spaced upstanding extensions along its top and spaced downwardly extending leg elements along its bottom, a plurality of transverse partitions each being hinged to the longitudinal partition below the upstanding extensions thereon and to the most proximate wall, said partitions being swingable from co-planar horizontal to spaced upright positions and being so offset as to wedgingly separate the walls and longitudinal partition when in the latter position, tabs excised from the bottom section in register with the leg elements along the bottom of the longitudinal partition and hinged to the bottom section adjacent the apex thereof, said leg elements being inserted through openings resulting from displacement of the tabs and into fixed abutment with the tabs, thereby forming a plurality of downwardly extending multi-ply supports medially of the bottom section, said supports cooperating with the upright transverse partitions to maintain the carton in erected, cushion forming condition.

8. A unitary carton comprising front and rear side walls, a bottom connecting the same, and a downwardly looped multi-ply longitudinal partion subdividing the space between the walls, transverse partitions hinged to the longitudinal partition and to the most proximate wall and being rotatable from coplanar horizontal to spaced upright positions subdividing the space between the longitudinal partition and the walls into a plurality of cells, tabs excised transversely from the bottom and being hinged thereto substantially in alignment with the longitudinal partition, said tabs being swingable into upright positions, and other tabs excised from one ply of the longitudinal partition and being swingable downwardly therefrom, in register with and secured to the first-named tabs to hold the longitudinal partition in fixed relation to the bottom.

9. A blank for a carton of the type described, comprising, in integrally connected relation, a pair of adjacent bottom-defining panels directly connected to one another by a medial hinge line, at least one of said panels being provided with a longitudinal series of longitudinally spaced cuts adjoining said hinge line each of which includes portions disposed transversely of and terminating at said hinge line, thereby to provide a set of tabs disposable at an angle to the bottom defined by said panels when said carton is in completed condition, a pair of longitudinal partition-defining panels in transversely spaced, longitudinally fixed relation to said bottom-defining panels, said last named panels being directly connected to one another along a medial fold line on which they are foldable to provide a multiple-ply longitudinal partition, at least one of said partition defining panels being provided with a longitudinal series of spaced cuts alternating in the longitudinal direction with said first named cuts and each including portions disposed transversely of and in intersecting relation to said medial fold line, thereby to provide a set of tabs projecting therefrom and extending longitudinally thereof, said respective pairs of panels being foldably connected to one another in a manner to permit the said respective sets to be disposed in side-by-side relation in the completed condition of the carton, a pair of side walls, and transverse partition means hinged to at least one of said side walls for disposition transversely of said longitudinal partition in the completed and erected condition of the carton.

10. A blank for a carton of the type described, comprising, in integrally connected relation, a pair of adjacent bottom-defining panels directly connected to one another by a medial hinge line, at least one of said panels being provided with a longitudinal series of longitudinally spaced cuts adjoining said hinge line each of which includes portions disposed transversely of and terminating at said hinge line, thereby to provide a set of tabs disposable at an angle to the bottom defined by said panels when said carton is in completed condition, a pair of longitudinal partition-defining panels in transversely spaced, longitudinally fixed relation to said bottom-defining panels, said last named panels being directly connected to one another along a medial fold line on which they are foldable to provide a multiple-ply longitudinal partition, at least one of said partition-defining panels being provided with a longitudinal series of spaced cuts alternating in the longitudinal direction with said first named cuts and each including portions disposed transversely of and in intersecting relation to said medial fold line, thereby adjoining said fold line to provide a set of tabs projecting therefrom and extending longitudinally thereof, said respective pairs of panels being foldably connected to one another in a manner to permit the said respective sets to be disposed in side-by-side relation in the completed condition of the carton, a pair of side walls, and transverse partition means hinged to at least one of said side walls for disposition transversely of said longitudinal partition in the completed and erected condition of the carton.

11. A blank for a carton of the type described, comprising, in integrally connected relation, a pair of adjacent bottom-defining panels directly connected to one another by a medial hinge line, at least one of said panels being provided with a longitudinal series of longitudinally spaced cuts adjoining said hinge line each of which includes portions disposed transversely of and terminating at said hinge line, thereby to provide a set of tabs disposable at an angle to the bottom defined by said panels when said carton is in completed condition, a pair of longitudinal partition-defining panels in transversely spaced, longitudinally fixed relation to said bottom-defining panels, said last named panels being directly connected to one another along a medial fold line on which they are foldable to provide a multiple-ply longitudinal partition, at least one of said partition-defining panels being provided with a longitudinal series of spaced cuts alternating in the longitudinal direction with said first named cuts and each including portions disposed transversely of and in intersecting relation to said medial fold line, thereby to provide a set of tabs projecting therefrom and extending longitudinally thereof, said respective sets of tabs being in transverse alignment and said respective pairs of panels being foldably connected to one another in a manner to permit the said respective sets to be disposed in side-by-side relation in the completed condition of the carton, a pair of side walls, and trans-

verse partition means hinged to at least one of said side walls and to said respective partition-defining panels on margins of the latter spaced from said fold line for disposition transversely of said longitudinal partition in the completed and erected condition of the carton.

12. A one piece paperboard egg carton including connected bottom, front and rear side walls, the bottom being inclined upwardly from the lower edges of the front and rear walls toward and along its longitudinal center and having slots therein, a cover integral with the rear side wall, partition-forming means including a glue strip, a vertically disposed longitudinal partition extending longitudinally medially of the carton between the front and rear walls, and spaced transverse partitions integral with the vertical partition and extending on opposite sides thereof to the front and rear walls respectively to provide spaced rows of egg receiving cells, said partition-forming means including a portion integrally attached to the upper edge of the front side wall and extending across the carton and adhesively secured to the upper portion of the rear side wall by means of the glue strip, the said longitudinal partition comprising an integral portion of the partition-forming means folded upon itself and adhesively secured together, said reversely folded portion of the partition having integral supporting projections extending downwardly therefrom through and outwardly of the slots in the bottom and terminating substantially in the plane of the lower edges of the front and rear walls.

13. A one piece paperboard egg carton including connected bottom, front and rear side walls, the bottom being inclined upwardly from the lower edges of the front and rear walls toward and along its longitudinal center and having slots therein, a cover integral with the rear side wall, partition-forming means including a glue strip, a vertically disposed longitudinal partition extending longitudinally medially of the carton between the front and rear walls, and spaced transverse partitions integral with the vertical partition and extending on opposite sides thereof to the front and rear walls respectively to provide spaced rows of egg receiving cells, said partition-forming means including a portion integrally attached to the upper edge of the front side wall and extending across the carton and adhesively secured to the upper portion of the rear side wall by means of the glue strip, the said longitudinal partition comprising an integral portion of the partition-forming means folded upon itself and adhesively secured together, said reversely folded portion of the partition having integral supporting projections extending downwardly therefrom through and outwardly of the slots in the bottom and terminating substantially in the plane of the lower edges of the front and rear walls, said supporting projections of the reversely folded adhesively secured together portion of the longitudinal partition extending downwardly through and beyond the slots in the bottom and being adhesively secured to downwardly extending integral tabs on the bottom adjacent the slots for retaining the longitudinal center of the bottom in raised and upwardly inclined cushion-forming position.

14. A one piece paperboard egg carton including connected bottom, front and rear side walls, the bottom being inclined upwardly from the lower edges of the front and rear walls toward and along its longitudinal center and having slots therein, a cover integral with the rear side wall, partition-forming means including a glue strip, a vertically disposed longitudinal partition extending longitudinally medially of the carton between the front and rear walls, and spaced transverse partitions integral with the vertical partition and extending on opposite sides thereof to the front and rear walls respectively to provide spaced rows of egg receiving cells, said partition-forming means including a portion integrally attached to the upper edge of the front side wall and extending across the carton and adhesively secured to the upper portion of the rear side wall by means of the glue strip, the said longitudinal partition comprising an integral portion of the partition-forming means folded upon itself and adhesively secured together, said reversely folded portion of the partition having integral supporting projections extending downwardly therefrom through and outwardly of the slots in the bottom and terminating substantially in the plane of the lower edges of the front and rear walls, the upper edge of the integral reversely folded portion of the longitudinal partition extending above the upper edge of the front side wall of the carton when erected, thus providing a support for the cover when the cover is in closed position.

MARTIN BURGER.

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