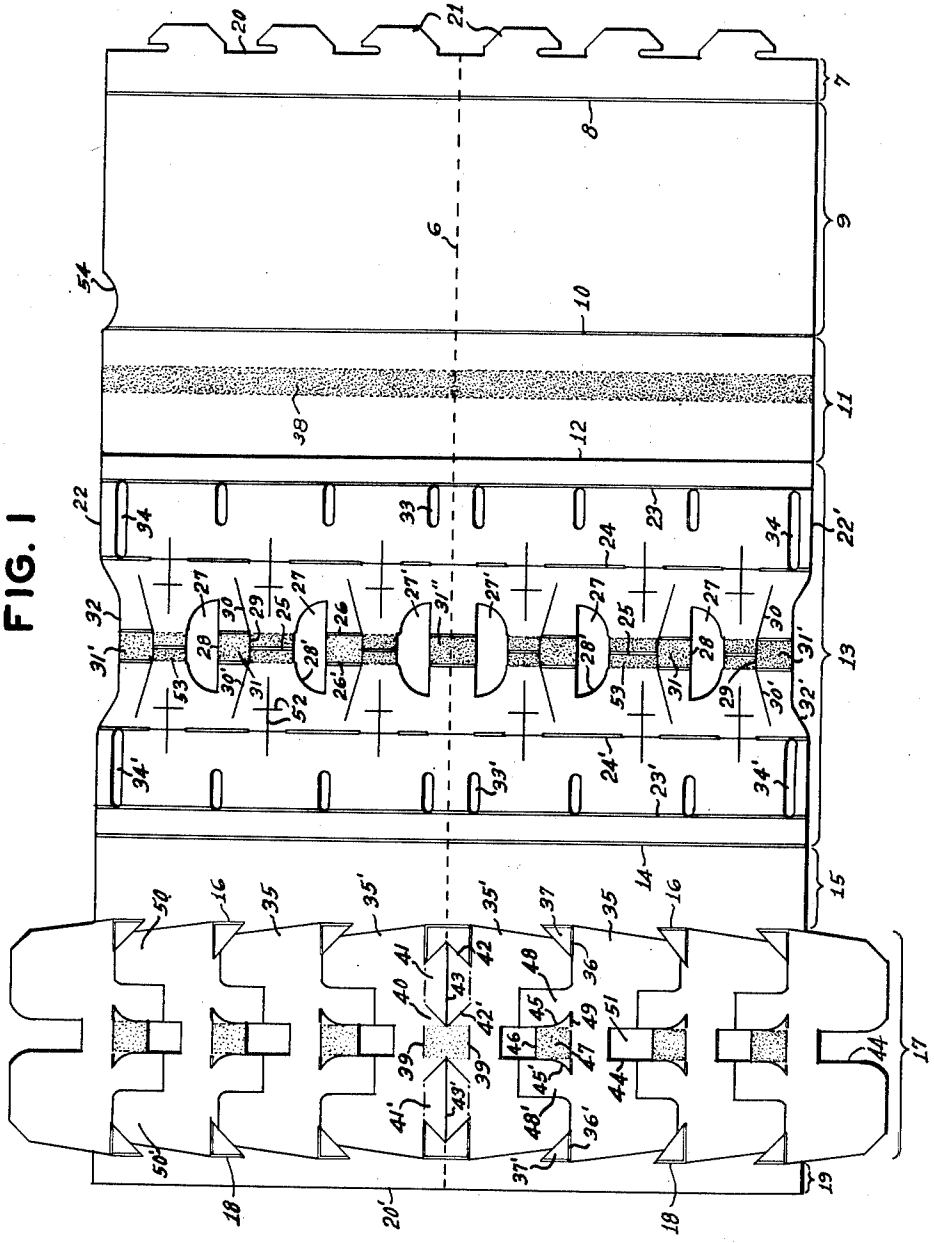
April 26, 1955 O. L. VINES 2,707,073

EGG CARTON

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FIG. 1



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FIG. 2

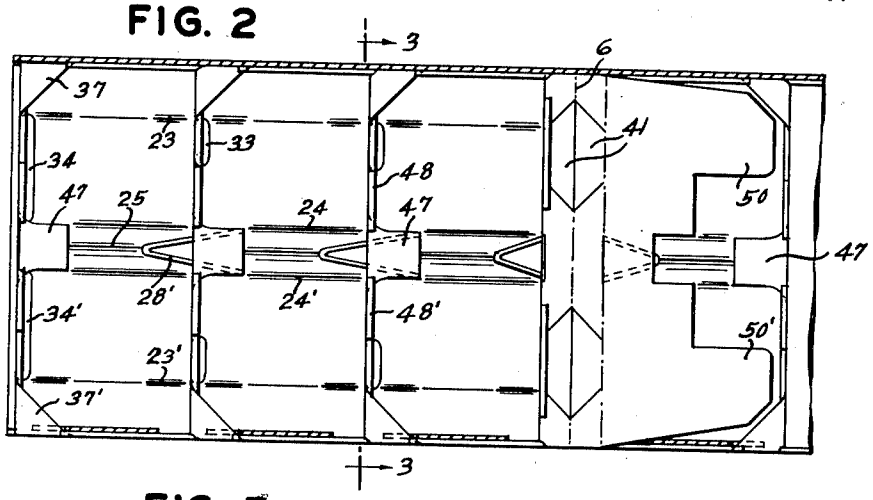


FIG. 3

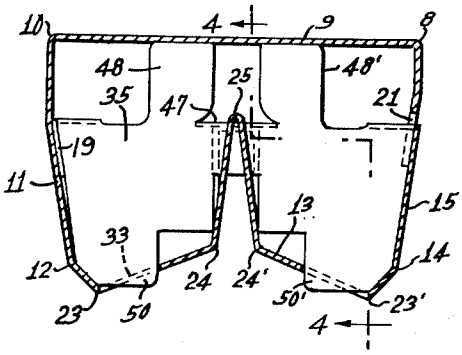


FIG. 4

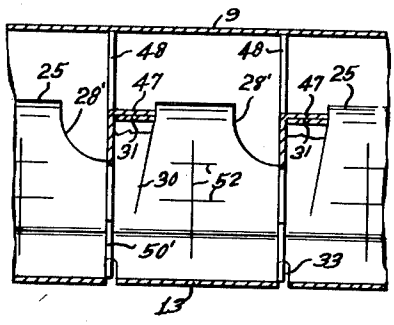
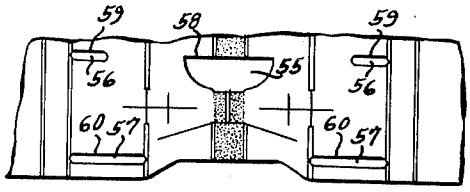


FIG. 5



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2,707,073

EGG CARTON

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Application August 22, 1952, Serial No. 305,745

4 Claims. (Cl. 229—28)

This invention relates to a collapsible multicelled carton primarily intended for packaging eggs but also suitable for holding any articles having generally spherical or spheroidal shapes.

A carton for packaging eggs or similarly fragile articles must meet two general requirements. First, it must fold flat for handling and shipment when empty; second, it must be easily erected, and, when erected, must have sufficient rigidity to protect the articles contained therein against ordinary crushing and joggling. Inasmuch as such cartons are usually intended to be discarded after a single use, they are made of inexpensive paper board, a material which, of itself has little rigidity. It is therefore necessary to rely on the various panels and partitions of the erected carton to support and stiffen each other. Such support and stiffening is usually obtained by dovetailing the transverse and longitudinal panels or partitions of the carton in such a manner that no partition has a very extensive unsupported section. This method does not however provide more than the inherent stiffness of the paper board material itself, and results in a carton which has relatively small resistance to crushing by transverse forces unless the structure of the carton is made very complex. However, as the carton structure becomes more complex, its production, assembly and erection becomes correspondingly more costly and time consuming.

I have now invented a novel egg carton structure, the blank for which may be cut from a single sheet of paper board. My new structure provides greatly increased resistance to transverse crushing of the carton as well as greater over-all rigidity. I achieve this desirable feature in a carton having the customary cover panel, side and bottom wall panels, a central longitudinal partition, and a transverse partition panel from which depend into the carton a plurality of transverse partitions, by providing horizontal lands on the longitudinal partition adjacent each transverse partition and a stiffening member on the upper edge of each transverse partition intermediate its ends. The stiffening member is adapted to be folded out of the plane of the transverse partition and into a plane normal thereto and to be adhesively secured to the land adjacent that partition. It will be apparent that such stiffening members impart structural rigidity to the transverse partitions over substantial parts of their lengths. This is in marked contrast to conventional carton structures which merely restrain the very central portions of their transverse partitions against bending out of their normal planes under the application of endwise forces, but leave the unsupported spans of the partitions free to flex.

My invention will be easily understood from the following description of a preferred embodiment and the accompanying drawings. In these drawings,

Fig. 1 is a plan view of an egg carton blank of the invention;

Fig. 2 is a plan view of an egg carton assembled from the blank of Fig. 1 but with the cover removed;

Fig. 3 is a sectional view of the egg carton of Fig. 2 taken along the line 3—3;

Fig. 4 is a partial sectional view of the carton of Fig. 3 taken along the line 4—4; and

Fig. 5 is a partial view of a modification of the blank of Fig. 1 in the region of an end of the central partition section.

Referring now to Fig. 1, a blank for an egg carton is formed from a single sheet of paper board of the type known as carton stock, and is advantageously provided with a longitudinal central perforation line 6. The blank

is divided by continuous transverse score lines 8, 10, 12, and 14 and intermittent transverse score lines 16 and 18 which define respectively a closing strip 7, a cover panel 9, a side panel 11, a bottom and central partition panel 13, a side panel 15, a transverse partition panel 17, and a gluing strip 19. The blank is generally bounded by transverse edges 20 and 20' and longitudinal edges 22 and 22'. Integral with the closing strip 7 and extending from the transverse edge 20 are locking tongues 21 whose function is conventional in cartons of this type.

The central partition panel 13 is further subdivided by continuous transverse score lines 23, 23', 24 and 24', by an intermittent central transverse score line 25, and by intermittent transverse score lines 26 and 26' parallel to and substantially equidistant from the central score line 25 on each side thereof. Symmetrically disposed about the central score line 25 and spaced along it are substantially semi-circular partition recess apertures 27 and 27' each defined by a linear edge 28 and a curved edge 28'. The linear edge 28 of each aperture faces the longitudinal perforation line 6 of the blank.

Cuts 29, perpendicular to transverse score line 25 and extending between transverse score lines 26 and 26', are provided approximately midway between the curved edge 28' of each aperture 27 and the linear edge 28 of the adjacent aperture, or approximately midway between an aperture 27 and the recessed portion of longitudinal edge 22 or 22', as the case may be. Continuous of cuts 29, and extending outwardly from their ends at a slight angle away from the central perforation line 6, are cuts 30 and 30'.

The cuts 29, in combination with the linear edges 28 of apertures 27 and transverse score lines 26 and 26' nearest each cut delineate land sections 31. As exceptions, land sections 31' nearest the longitudinal edges 22 and 22' are formed by cuts 29, transverse score lines 26 and 26', and recessed edges 32 and 32' of the blank, and the centermost land section 31'' is bounded by transverse score lines 26 and 26' and the linear edges 28 of the apertures 27 which face each other near the center of the panel 13. All of these land sections are foldably attached along transverse score lines 26 and 26' to portions of the central partition panel which are partially severed from the remainder of the panel by cuts 30 and 30'.

The areas of the panel 13 between score lines 12 and 23 and score lines 23 and 24 and the areas between the score lines 24' and 23' and score lines 23' and 14 constitute two bottom sections of the carton blank. In line with the linear edges 28 of apertures 27 and 27', and extending inwardly from the transverse score lines 23 and 23', are partition tongue slots 33 and 33'. Adjacent and parallel to the longitudinal edges 22 and 22' of the blank are similar partition tongue slots 34 and 34' which I prefer to make somewhat longer than the tongue slots 33 and 33'. These tongue slots receive the tongues on the transverse partitions of the erected carton.

The area of the blank previously referred to as the transverse partition section 17, which lies between intermittent transverse score lines 16 and 18, is cut and scored to form transverse partitions 35 and 35'. Opposite ends of each of partitions 35 and 35' are foldably attached to the side wall 15 and to the gluing strip 19 along transverse score lines 16 and 18, respectively. Perpendicular to these score lines and colinear with linear edges 28 of apertures 27 are score lines 36 and 36' which form triangular gussets 37 and 37' on each partition. Partitions 35' nearest the perforation line 6 are foldably attached to a communicating stiffening bridge 40 along score lines 39. These partitions 35' are also provided with tabs 41 and 41' which are defined by V-shaped cuts 42 and 42' and cuts 43 and 43' colinear with the perforation line 6.

The ends and bottom edges of partitions 35 and 35' are formed by cuts 44 which define a central rectangular recess in each partition and depending tongues 50 and 51' on each side of the recess. These cuts 44 also define the upper edges of adjacent partitions. Additionally, cuts 45, 45' and 46 partially sever securing tabs 47 from the upper edges of partitions 35 and complete the definition of cover supporting tabs 48 and 48'. The stiffening tabs are foldably attached to the partitions 35 along score lines 49 and the supporting tabs are integral with the par-

titions. It will be noted that making the cuts **46** completely severs small rectangles of the blank and leaves rectangular apertures **51** in their stead. These apertures have a function to be explained in connection with the discussion relating to assembly of the carton.

For easier folding of the blank any or all of the score lines may be suitably relieved by intermittent cuts or perforations. Furthermore, those surfaces of the blank which will have contact with the articles to be packed in the erected carton may be given greater resiliency by making intersecting cuts in the blank as generally indicated at **52**.

The cover panel **9** is advantageously provided with a recess **54** in the edge **22** and adjacent the score line **10**. This recess permits a finger hold to be had on the packed carton to facilitate its removal from a closely packed crate of cartons.

The carton blank described above is assembled by a relatively simple procedure. Glue is applied, as by a gluing wheel, to the flat carton blank areas generally indicated by the stippled areas **53** and **38**. The glued area **53** has substantially the same width as the land sections **31** and **31'** in panel **13** and the apertures **51** in panel **17**. The blank is then folded about the score line **14** so that the transverse partition section overlays the central partition section and stiffening tabs **47** adhere to the land sections **31** and **31'**. It will be noted that the apertures **51** overlay all portions of the glued area **53** except the land sections **31** and thus preclude the glued portion of this area immediately adjacent the score line **25** from adhering to any part of the transverse partition panel **17**. The necessity for more tedious and expensive intermittent application of glue along the area **53** is thereby eliminated.

Following the folding of the blank about score line **14**, it is again folded about score line **12** to complete the assembly procedure. This operation brings the gluing strip **19** into adhesive contact with the glued area **38** of the side panel **11** approximately midway between the score lines **10** and **12** and parallel thereto. The carton is now ready to be erected as illustrated in Figs. 2 through 4, inclusive.

The assembled carton is erected by squeezing between the score lines **12** and **14** and thus moving the side **11** and **15** into upright positions about the intermittent score lines **16** and **18**, respectively. The structural relation of the central partition panel and the transverse partition panel achieved by gluing these parts together simultaneously causes the longitudinal central partition to be drawn into an upright position between the side panels. Then each of transverse partitions **35** and **35'** is pushed down into the carton so that its tongues **50** and **50'** engage the tongue slots **33** and **33'** or **34** and **34'** directly beneath the gussets by which the partition is attached to the side panels. It may be pointed out here that the innermost portions of the central rectangular partition recesses of the transverse partitions **35** and **35'** are so proportioned as to lend lateral support to and to prevent spreading of the longitudinal central partition (see Fig. 3) and the carton. To the same end, the innermost ends of the tongue slots **33** and **33'**, and **34** and **34'** are made to bear against the inner edges of the partition tongues **41** and **41'**, and **50** and **50'** respectively. The carton is now complete and ready to receive the objects to be packed therein.

In forming the blank for my improved carton I have found that the customary, but costly and time consuming, operation of removing the knockouts from the intended apertures in the blank may be reduced if the knockouts, other than those of apertures **51**, are only partially severed from the blank and are left joined thereto along a substantially straight line defined by a score line. With reference to Fig. 5, for example, the knockouts **55** of the longitudinal central partition recess apertures and the knockouts for the transverse partition tongue slots **56** and **57** are everywhere severed from the blank except along the score lines **58**, **59**, and **60**, respectively. At the time of erection the knockouts may be easily pushed out of the plane of the blank and the appropriate partition or tongue may enter the aperture as though the knockout had been completely removed therefrom. In this condition there is no danger of the knockouts becoming dislodged from the blank and clogging the carton assembly machine; nor will the knockouts create an unsightly clutter at the erection site. The only knockouts which must be completely removed from the blank are those in the apertures **51**. This insures that no part of the transverse partition panel other than the securing tabs **47** will adhere to the glued area **53**.

It will be noted that the perforation line **6** divides the erected carton into parts having an equal number of cells. This provides an easy and convenient means for severing the carton without impairing its structure where it is desirable to dispense in packaged form less than the total number of articles, such as eggs, contained in the whole carton. However, it will be apparent that my invention is equally applicable to egg cartons constructed without the perforated partition line **6** for separating the carton into halves. In that case the transverse partitions **35** and **35'**, their cooperating recess apertures **27**, and the locking tongues **21** may all extend in the same direction and the more elaborate center section immediately adjacent the perforated partition line **6** may be omitted.

I have thus provided a complete carton having exceptional rigidity for the better protection of fragile articles packed therein. To one skilled in the art it will be readily apparent that this rigidity is derived from the novel stiffening structure provided for the central portions of the transverse partitions in combination with the partitions being securely anchored at their ends to the side walls of the carton.

I claim:

1. A collapsible egg carton comprising outer side walls, two bottom walls communicating with the lower edges of the two side walls, upstanding inside walls integrally connected to the bottom wall sections and forming a longitudinal partition for the carton, the upstanding inside walls being discontinuously connected along their upper edges and being provided with fold lines and cut lines which alternately form longitudinally of the partition adjacent its upper extremity a horizontal land, an upwardly projecting inverted V-shaped portion and a downwardly extending recessed portion, the carton being further provided with upstanding transverse partition members integrally connected at the upper extremities of their ends to the outer side walls adjacent the upper edges thereof, the upper central body portion of each transverse partition member being positioned within the recessed portion of the longitudinal partition, the extreme upper central portion of each partition member being folded over onto and adhesively secured to the land adjacent said recessed portion.

2. A collapsible carton for packaging eggs comprising spaced substantially vertical first and second outside walls, a plurality of gussets foldably attached at longitudinally spaced locations along the upper edges of said outside walls, a plurality of substantially vertical transverse partitions, each transverse partition having a rectangular cutout intermediate its ends and extending upwardly from its lower edge to form depending tongues on opposite lower ends of said partition, opposite ends of the upper edge of each partition being foldably attached to the gussets on the first and second outside walls respectively, a securing tab for each transverse partition foldably attached along one edge thereof adjacent the intermediate section of the upper edge of the partition, first and second bottom walls having longitudinally spaced transverse slots therein to receive the depending tongues of said transverse partitions, the outermost edges of said first and second bottom walls being foldably attached to the lower edges of said first and second outside walls respectively, a double walled longitudinally extending vertical central partition having cutouts therein, the edges of the cutouts extending downwardly from the upper edges of the walls of said central partition to receive the central portions of said transverse partitions, horizontal lands supported along their longitudinal edges by partially detached sections of the walls of the central partition adjacent the transverse partitions, the upper surface of each land being rigidly attached to a surface of the securing tab on the transverse partition adjacent thereto, the upper edges of the walls of the central partition being foldably joined along those sections of the edges between a land and a cutout, the lower edges of the walls of the central partition being foldably attached to the inner edges of said first and second bottom walls respectively.

3. In an egg carton blank comprising consecutively a cover flap panel, a cover panel, a first side wall panel, a first bottom wall panel, two central longitudinal partition panels, a second bottom wall panel, a second side wall panel and a transverse partition panel, the trans-

verse partition panel being provided with cut lines defining a plurality of transverse partitions each hingedly connected with said panel so as to permit twisting of the partitions out of the plane of the panel and into planes normal thereto, and the two central longitudinal partition panels being provided with semi-circular cutouts each spanning adjacent portions of said two partition panels and each so positioned with respect to said transverse partition members as to provide in the upstanding longitudinal partition formed from the two longitudinal partition panels in the assembled and erected carton an opening permitting the aforementioned twisting of the transverse partition members into a plane normal to said partition panel, the improvement which comprises providing the adjoining central partition panels with mutually extensive discontinuous score lines extending longitudinally of the panels away from the linear edges of each semi-circular cutout, the two score lines being equidistantly positioned transversely of the panel on opposite sides of the line of joinder of the two longitudinal partition panels, whereby upon erection of the assembled carton the areas of the adjoining central partition panels between said mutually extensive discontinuous score lines become horizontal lands, the cut portions of the transverse partition panel defining the upper edges

of the transverse partitions being provided with a central protuberance adapted to be adhesively secured to said land.

4. A collapsible egg carton comprising longitudinal side walls and bottom walls, a longitudinal double walled central partition, upstanding transverse partitions fixed at their opposite ends between said side walls, said central partition having recessed portions to receive the central portions of said transverse partitions, the double walls of said central partition being joined along their upper edges and having partially detached sections adjacent the recessed portions thereof, said detached sections having their upper extremes flattened to form horizontal lands, and a tab joined to an extended central section of each of said transverse partitions and folded out of the plane thereof, said tab on each transverse partition being permanently secured to an adjacent land.

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