Aug. 20, 1957 R. P. BEMISS ET AL 2,803,392

EGG CARTONS

Filed June 28, 1956 3 Sheets-Sheet 1

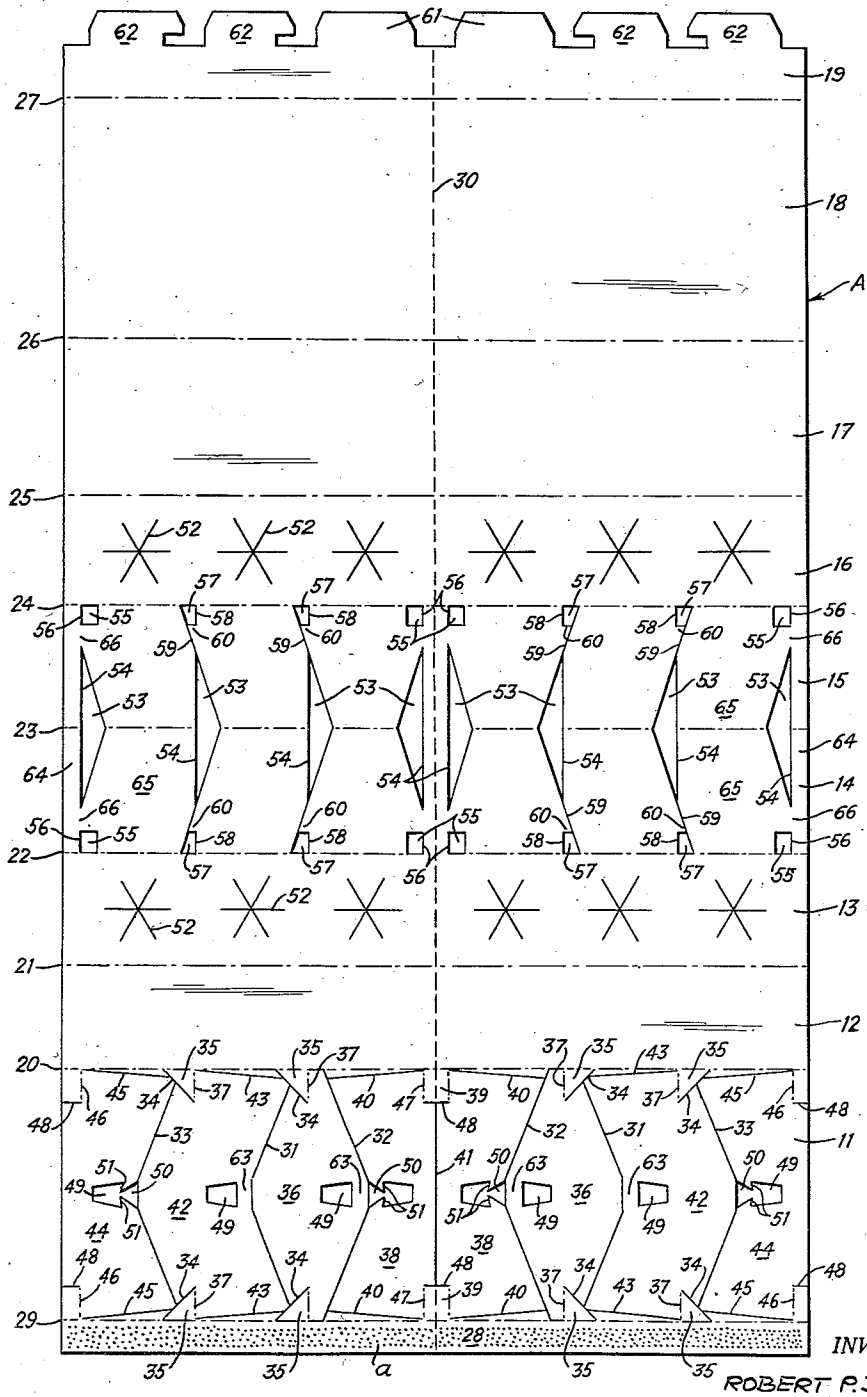


Fig. 1

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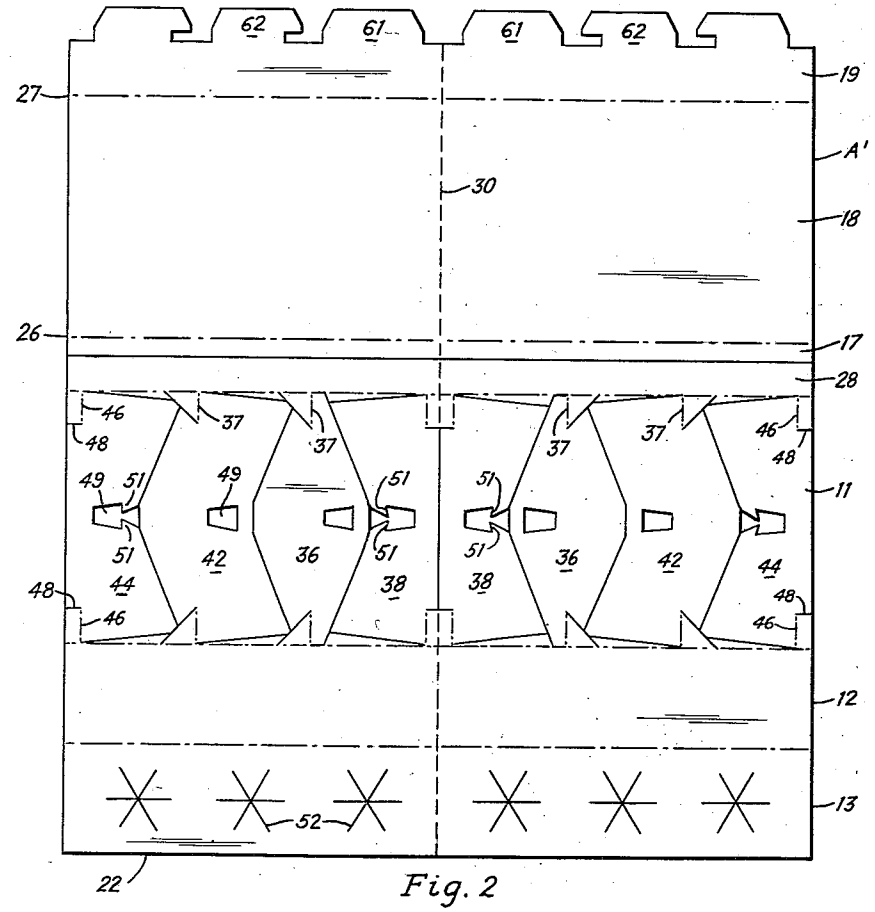


Fig. 2

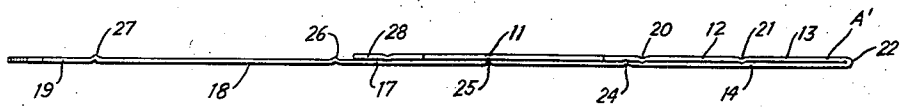


Fig. 3

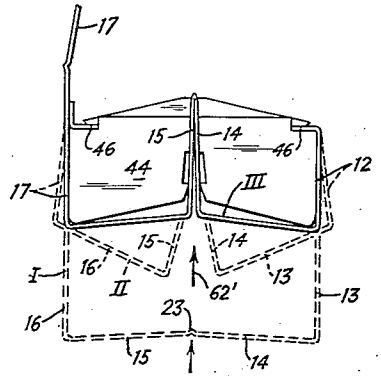


Fig. 4

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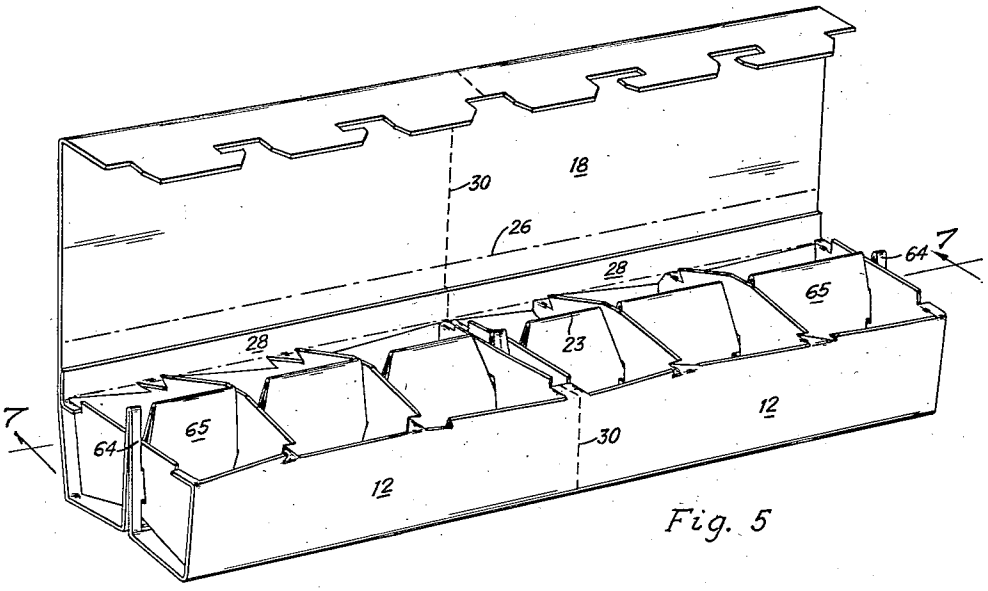


Fig. 5

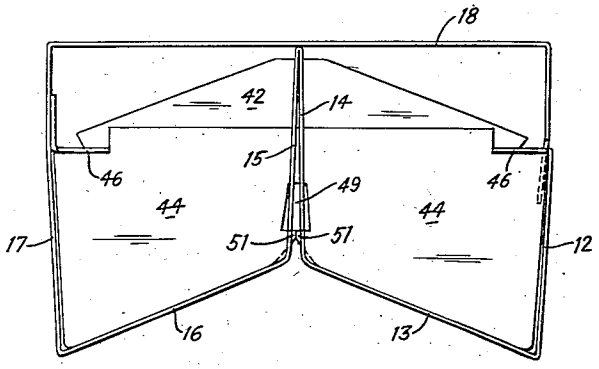


Fig. 6

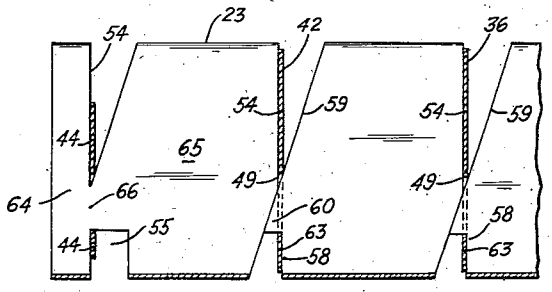


Fig. 7

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2,803,392

EGG CARTONS

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Application June 28, 1956, Serial No. 594,520

5 Claims. (Cl. 229—29)

This invention relates to improvements in cellular folding cartons for the packaging, in multiple, of fragile, or otherwise delicate, merchandise or food products, such as eggs.

Cellular cartons of the egg-carton type contain merchandise, for example eggs, in two parallel rows separated by a central partition or divider and the two rows, in turn, are subdivided into cells by a plurality of substantially vertically extending webs.

The cartons are erected from cut and scored blanks which, during the process of assembly, are folded along several crease lines to assume hollow box shape. During the assembly procedure the webs are generally moved into a substantially vertical position, whereas in the blank they had originally assumed a horizontal position, and means are customarily provided for interlocking the webs with the central partition in such a way that the webs remain upright and that the central partition is interlocked with the webs so that thereafter no vertical movement between the webs and the central partition can take place.

Generally the interlock between the central partition and the webs is formed by apertures into which projections extend. Such apertures, for example, may be provided in the webs and corresponding projections may be provided on portions of the center partition. Such interlocks engage generally by horizontal displacement of one panel relatively to each other, viewing the carton in a horizontal position, as if it were placed on a table.

In the use of egg cartons, however, the horizontal position is not always the normal position in which the filled carton is transported. In many instances filled egg cartons are placed in shopping bags in up-ended position in the retail store or supermarket. As a result, the weight of the eggs, instead of resting on the bottom, rests on the webs and acts on the partition in such a way as to disturb the interlock between the webs and the central partition. As a consequence the interlock between webs and the central partition is frequently disengaged and when the carton is handled thereafter, the eggs are likely to drop out and break.

The present invention provides an improved cellular carton construction in which disengagement between the central partition and the webs is prevented by a positive load-bearing engagement between the webs and the central partition which is effective in opposite directions so that the load resting on the webs is transferred to the one or the other adjacent portion of the central partition when one or the other end of the carton is raised in up-ending the carton. In providing for a load transferring engagement between the webs and the central partition it must, of course, be taken into consideration that the load transfer must be effective in both directions since it is uncertain whether the carton will be stood up on one end or the other in the shopping bag.

The various features, objects, and advantages, of the invention will appear more fully from the detailed description which follows accompanied by drawings showing, for the purpose of illustration, a preferred form of egg

carton embodying the invention. The invention also consists of certain new and original features of construction and combination of elements hereinafter set forth and claimed.

Although the characteristic features of the invention believed to be novel will be particularly pointed out in the claims appended hereto, the invention itself, its objects and advantages, and the manner in which it may be carried out may be better understood by referring to the description which follows taken in connection with the accompanying drawings forming a part of it, in which:

Figure 1 is a plan view of a flat blank from which an egg carton embodying the present invention may be made;

Figure 2 is a plan view of the blank shown in Figure 1 after an initial folding and gluing operation;

Figure 3 is an end view of the folded and glued blank shown in Figure 2;

Figure 4 is an end view of the squared blank of Figures 2 and 3 in the process of forming into cellular carton shape;

Figure 5 is a perspective view of the completed carton;

Figure 6 is an end view of the carton of Figure 4 with the cover in closed and locked position; and

Figure 7 is a detail, partly in section, through the web construction of the cellular carton body, the section being taken on line 7—7 of Figure 5.

In the following description and in the claims various details will be identified by specific names for the sake of convenience. The names, however, are intended to be generic in their application. Corresponding reference characters refer to corresponding parts in the several figures of the drawings.

The blank A shown in Figure 1 is rectangular in outline and may be cut and scored, in multiple, from large rolls or sheets of foldable sheet material, for example paperboard, on automatic cutting and scoring machines with a minimum of waste of stock due to the absence of portions protruding beyond the substantially rectangular outline of the blank. The blank is shown with its unfinished back side facing the observer.

These several constituent parts or portions of the blank are set apart by fold or crease lines. The blank comprises a web panel 11, an outer side wall panel 12, a bottom panel 13, inner slide wall panels 14 and 15 which in the assembled carton form the central partition, a further bottom panel 16, a further outer side wall panel 17, a cover panel 18, and a tuck flap 19. These panels are articulated to one another along fold lines 20, 21, 22, 23, 24, 25, 26, and 27.

For reasons of more convenient identification the fold lines 21 and 25 will also be called outer bottom fold lines, the fold lines 22 and 24 will be called inner bottom fold lines, the fold line 23 will be termed partition or ridge fold line, the fold line 26 may be referred to as the hinge cover fold line and the fold line 27 will sometimes be named tuck flap fold line.

A glue lap 28 is articulated to the top web panel 11 along an inner top fold line 29, the other bordering fold line 20 of the wall panel 11 being termed outer top fold line.

A dividing line 30 preferably produced by a series of interrupted cuts permits the resulting carton to be broken into equal halves along a plane separation extending substantially normal to the center partition, as will later appear.

The top panel 11 is traversed by a plurality of cut lines to provide a cellular web structure. Cut lines 31, 32 and 33 extend transverse of the panel 11, substantially from one top fold line 20 to the other top fold line 29. More particularly, the cut lines 31 extend to, and terminate at, diagonal cuts 34. These diagonal cuts form an edge and side of substantially triangular hinge panels 35

to which the web 36 remains articulated along a pivot line 37. One hinge panel 35 is articulated to the outer side wall panel 12 along the outer top fold line 20 and the opposite hinge panel 35 is articulated to the glue lap 28 along the inner top fold line 29.

The cut line 32 forms an edge on the web 36 and on the adjacent web 38. The cut lines 32 extend from the outer top fold line 20 to the inner top fold line 29. Hinge panels 39 of substantially rectangular configuration are provided for the webs 38 whose lateral cut edges 40 terminate at the rectangular hinge panels 39. The two centrally located webs 38 are severed by a central cut 41 in line with the dividing cut score or interrupted cut 30.

Between the transverse cut lines 31 and 33 further webs 42 are formed. The webs 42 are hingedly connected to substantially triangular hinge panels 35 along pivot lines 37, and lateral cut edges 43 extend to the pivot lines 37.

The endmost webs 44 are bordered by the transverse cut line 33, lateral cut edges 45 and the side edges of the carton blank. They are articulated to the glue lap 28 and the outer side wall panel 12 at pivot lines 46, which, like the pivot lines 47 of the rectangular hinge panels 39, end at cuts 48 extending substantially at right angles to the pivot lines 46 and 47.

The webs 38 may be termed center webs, the webs 36 and 42 may be called intermediate webs and the webs 44 may be termed endmost webs.

All webs have apertures 49 cut into them. The apertures 49 of the intermediate webs lie entirely within the body of the webs. The apertures 49 of the central webs 38 and the endmost webs 44 are accessible through substantially wedge-shaped cuts extending into the interior of the apertures. For this purpose substantially triangular pieces 50 of the stock are removed from the blank. The apexes of the triangles lie slightly inside the apertures 49 and result in the formation of opposite projections 51 whose purpose will later be described.

The bottom panels 13 and 16 may be provided with star cuts 52 to provide a resilient support for the bottoms of eggs.

The inner side wall panels 14 and 15 which, in folded position, form the center partition of the carton have triangular pieces 53 cut therefrom. The bases 54 of the triangles are aligned with the pivot lines 46, 37 and 47, respectively, except for an allowance for board thickness, where desired. In the assembled carton the edges 54 form an edge-to-surface engagement with the respective webs swung into upright position about their respective pivot lines.

Further, but substantially smaller, pieces of stock are removed from the inner side wall panels 14 and 15 along the inner bottom fold lines 22 and 24. Apertures 55 are substantially rectangular and comprise one side 56 which lies substantially in line with the base cut 54 of the triangles 53. Other apertures 57 are quadrilaterals and comprise one side 58 which lies in line with the base cuts of the intermediate triangles 53, except for possible allowance for the thickness of the stock. The intermediate triangles 53 comprise side edges formed by continuous cuts 59 extending to the quadrilaterals 57 and forming projections 60.

The tuck flap 19 has a plurality of guiding projections 61 and interlocking projections 62 on it which may be of any conventional form.

The assembly of an egg carton from the blank A may proceed as follows:

In the first operation, adhesive *a* is applied to the glue lap 28 and the blank is then folded at the fold line 22 to bring the glue lap 28 into adhesive engagement with the outer side wall panel 17. This folding and gluing operation may be performed on a conventional straight-line gluing machine and is the only gluing operation required in the manufacture of the carton.

The folded blank A' is shown in Figures 2 and 3. It constitutes a flat collapsed tubular structure which is

ready for setting up into hollow carton form. Tubular blanks A' may be stored and shipped in flat condition. They require a minimum of space and may be set up into hollow carton form by performance of a few folding and assembly operations which may be carried out in the egg packer's plant. These assembly operations will now be described:

The blank A is first expanded into hollow tubular form as shown in Figure 4, the configuration identified by I showing the first stage in assembly. Thereafter, or substantially simultaneously, the webs 44, 42, 36 and 38 are swung into upright vertical position at their respective pivot lines. The blank is then folded along the ridge fold line 23 and the ridge fold line is moved in an upward direction as indicated by the arrow 62', whereby the position identified by II is reached. At this point substantially V-shaped notches formed in the panels 14 and 15 by the previous removal of the triangular pieces 53 permit the central partition to move up between the vertical webs until the final position III is reached. At the final stage interlocks are formed between the web and the central partition as follows:

The hook-shaped projections 60 engage the apertures 49 in the intermediate webs 42 and 36 as shown in Figure 7. This engagement is formed by causing the web portion 63 underneath the aperture 49 to slide past the projection 60 along the slanted cut 59.

A further interlock is formed between the endmost and central webs 44 and 38 and the center partition 14, 15 where the hook-shaped projections 51 at the apertures 49 engage the apertures 55 (Figures 6 and 7).

It is readily apparent from Figure 7 that in the engaged position each web is supported by the central partition against displacement to the right and to the left. For example, the web 42 rests against the central partition at the edge 54, and so does the web 36. The web portion 63 bears against the central partition in the opposite direction, the supporting edge of the central partition being the side 58 of the quadrilateral.

Similarly, the endmost web 44 rests against the cut edge 54 of the endmost portion of the central partition and a similar engagement is formed at the aperture 55. It will be observed that at this point resistance to force in only one direction is required. In the event the carton is stood up on end so that the illustrated portion lies bottommost, the weight of the eggs tends to displace the web 44 to the left. The web resists this force by the edge-to-panel engagement with the central partition. This support is particularly effective since the end portion 64 of the central partition is attached to the next portion 65 at 66. If the portion 64 forms the top of the upended carton, the web 44 supports no weight.

What is claimed is:

1. A cellular carton for a plurality of articles, more particularly eggs, arranged in two rows, the carton consisting of a single sheet of foldable sheet material creased along fold lines setting apart the several constituent portions of the carton, the carton comprising, a pair of outer side wall panels; a pair of center panels folded back to back along a top center line and forming a two-ply partition between the side wall panels; a pair of bottom panels articulated to said side wall panels and said center panels along crease lines; a cellular top structure dividing the space to either side of the center panels into individual article receiving cells, said top structure comprising webs articulated to said side wall panels and extending at substantially right angles to the side wall panels from one side wall panel to the other and transverse to, and across, said center panels, said webs being of single-ply thickness and comprising endmost webs at the ends of the carton and intermediate webs between said endmost webs, said webs having central apertures therein and extending through substantially V-shaped notches in the center partition, one leg of the V being vertical, the other leg of the V being inclined to the vertical, said intermediate webs

resting in edge-to-surface abutment against the vertical portion of the V above the said aperture, said V notches continuing below the apex of the V as a cut substantially in line with the inclined leg of the V, the center partition being recessed at said aperture by a recess extending away from the inclined cut so as to form a hook-shaped projection engaging said aperture, the recess having a substantially vertical portion substantially in line with the vertical leg of the V against which vertical portion of the recess the portion of the web below the aperture rests in edge-to-surface abutment.

2. A cellular carton for a plurality of articles, more particularly eggs, arranged in two rows, the carton consisting of a single sheet of foldable sheet material creased along fold lines setting apart the several constituent portions of the carton, the carton comprising, a pair of outer side wall panels; a pair of center panels folded back to back along a top center line and forming a two-ply partition between the side wall panels; a pair of bottom panels articulated to said side wall panels and said center panels along crease lines; a cellular top structure dividing the space to either side of the center panels into individual article receiving cells, said top structure comprising webs articulated to said side wall panels and extending at substantially right angles to the side wall panels from one side wall panel to the other and transverse to, and across, said center panels, said webs being of single-ply thickness and comprising endmost webs at the ends of the carton and intermediate webs between said endmost webs, said webs having central apertures therein and extending through substantially V-shaped notches in the center partition, one leg of the V being vertical, the other leg of the V being inclined to the vertical, said intermediate webs resting in edge-to-surface abutment against the vertical portion of the V above the said aperture, said V notches continuing below the apex of the V as a cut substantially in line with the inclined leg of the V, the center partition being recessed at said aperture by a recess extending away from the inclined cut so as to form a hook-shaped projection engaging said aperture, the recess having a substantially vertical portion substantially in line with the vertical leg of the V against which vertical portion of the recess the portion of the web below the aperture rests in edge-to-surface abutment; a cover panel articulated to one of the outer side wall panels and a tuck flap articulated to the cover panel, the upper edge of at least certain of said intermediate webs being gable-shaped, rising, from the line of articulation of the webs to the outer side wall panels, substantially to the ridge of the center partition.

3. A cellular carton for a plurality of articles, more particularly eggs, arranged in two rows, the carton consisting of a single sheet of foldable sheet material creased along fold lines setting apart the several constituent portions of the carton, the carton comprising, a pair of outer side wall panels; a pair of center panels folded back to back along a top center line and forming a two-ply partition between the side wall panels; a pair of bottom panels articulated to said side wall panels and said center panels along crease lines; a cellular top structure dividing the space to either side of the center panels into individual article receiving cells, said top structure comprising webs articulated to said side wall panels and extending at substantially right angles to the side wall panels from one side wall panel to the other and transverse to, and across, said center panels, said webs being of single-ply thickness and comprising endmost webs at the ends of the carton and intermediate webs between said endmost webs, said webs having central apertures therein and extending through substantially V-shaped notches in the center partition, one leg of the V being vertical, the other leg of the V being inclined to the vertical, said intermediate webs resting in edge-to-surface abutment against the vertical portion of the V above the said aperture, said V notches continuing below the apex of the V as a cut substantially in line with the inclined leg of the V, the center partition being recessed at said aperture by a recess extending away from the inclined cut so as to form a hook-shaped projection engaging said aperture, the recess having a substantially vertical portion substantially in line with the vertical leg of the V against which vertical portion of the recess the portion of the web below the aperture rests in edge-to-surface abutment, said central partition being subdivided into sections by said V-shaped notches, the endmost V notches terminating at the apex of the V and the endmost section being integral with the adjacent partition section below the apex of the endmost V, the apertures in the endmost webs having a cut extending to the aperture from the bottom edge of the web, there being a further aperture in the central partition below the apex of the endmost V's, said further aperture being engaged by edges bordering the aperture in the endmost webs, said engaging edges lying adjacent the said cut extending from the bottom edge.

4. A cellular carton for a plurality of articles, more particularly eggs, arranged in two rows, the carton being divisible into two half-portions along a dividing line half way between the ends, the carton consisting of a single sheet of foldable sheet material creased along fold lines setting apart the several constituent portions of the carton, the carton comprising a pair of outer side wall panels; a pair of center panels folded back to back along a fold center line and forming a two-ply partition between the side wall panels, at right angles to said dividing line; a pair of bottom panels articulated to said side wall panels and said center panels along crease lines; a cellular top structure dividing the space to either side of the center panels into individual article receiving cells, said top structure comprising webs and hinge panels articulated to said webs and to said side panels along fold lines forming an angle of substantially 90 degrees, said webs extending at substantially right angles to the side wall panels from one side wall panel to the other and transverse to, and across, said center panels, said webs being of single-ply thickness and comprising endmost webs at the ends of the carton and at the center adjacent said dividing line, and intermediate webs between said endmost webs, said webs having central apertures therein and extending through substantially V-shaped notches in the center partition, one leg of the V being vertical, the other leg of the V being inclined to the vertical, said intermediate webs resting in edge-to-surface abutment against the vertical portion of the V above said aperture, said V notches through which the intermediate webs extend continuing below the apex of the V as a cut substantially in line with the inclined leg of the V, the center partition being recessed at said aperture by a recess extending away from the inclined cut so as to form a hook-shaped projection engaging said aperture, the recess having a substantially vertical portion substantially in line with the vertical leg of the V against which vertical portion of the recess the portion of the web below the aperture rests in edge-to-surface abutment, the central partition being subdivided into sections by said V-shaped notches, the endmost V notches terminating at the apex of the V and the endmost partition portions being integral with the adjacent partition section below the apex of the V, the apertures in the endmost webs having a V-cut extending to the aperture from the bottom of the web, there being a further aperture in the center partition below the apex of the endmost V, said further aperture being engaged by the

portions of the aperture in the endmost webs adjacent the cut extending from the bottom edge.

5. A cellular carton as set forth in claim 4 in which the edges of the V notches which border the endmost sections of the center partition adjacent the ends and adjacent the dividing line are vertical.

References Cited in the file of this patent

UNITED STATES PATENTS

2,017,650	Burger	Oct. 15, 1935
2,113,459	Brundin	Apr. 5, 1938
2,707,073	Vines	Apr. 26, 1955