Dec. 25, 1956 O. L. VINES 2,775,390

CARTON

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Fig. 1.

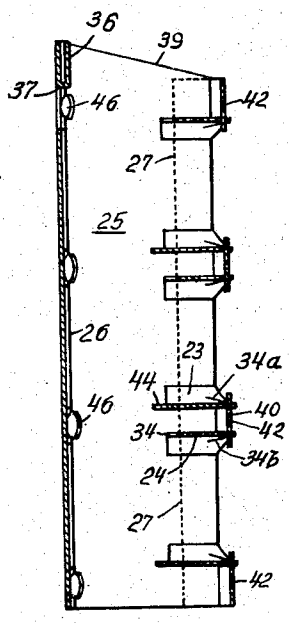


Fig. 3.

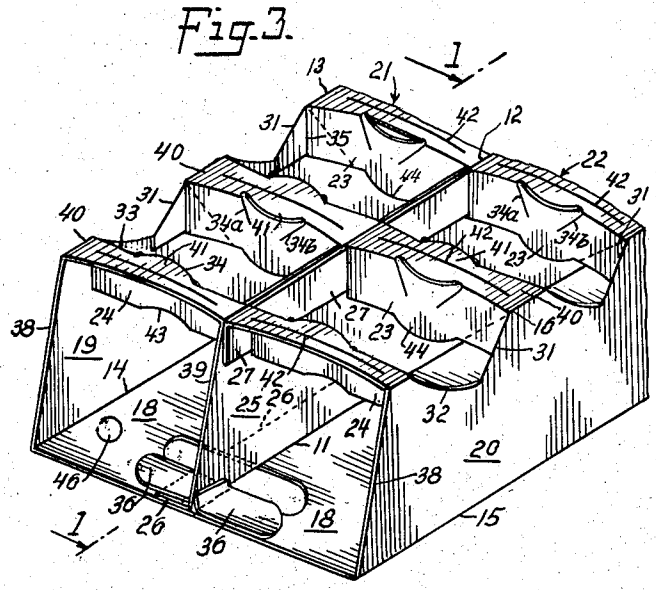
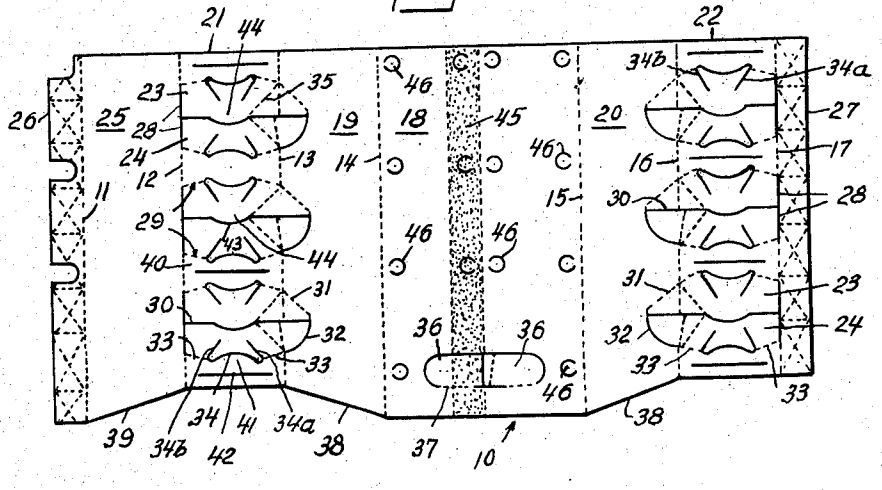


Fig. 2.



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CARTON

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3 Claims. (Cl. 229—28)

This invention relates to collapsible cartons, and to the blanks therefor, useful as carriers for perishable articles. More particularly, the invention is concerned with carriers which permit produce such as apples, peaches, and the like to be shipped in stacked relation between individual partitions for each article.

It is well recognized that produce such as peaches, apples, and the like have better flavor if allowed to ripen as long as possible before picking. Where permitted to ripen partially before picking, it is also well known that the produce can bruise easily during packing and shipment. Merchantability of such tree-ripened articles can accordingly be increased by packing them directly in a carrier carton which individually compartments and retains the produce for direct use by the consumer. To provide such a carrier, however, it is necessary that the partitions therefor be flexible to permit ease of insertion and yet be strong enough to provide adequate compartmentation. Also, the appearance of the carton should be such as to suggest to the shipper the best way in which the filled carton is to be handled. In this way, desirably seasoned produce will reach the consumer in a thoroughly merchantable condition.

In copending U. S. patent applications Serial No. 202,914, filed December 27, 1950, now Patent No. 2,717,115 and Serial No. 281,791, filed April 11, 1952, now Patent No. 2,717,116 I have described partitioned cartons for packaging a plurality of spherically-shaped fruit. These cartons hold the article securely in place within individual compartments and at the same time allow visual inspection of the contents. A top panel in the cartons is provided with fold sections adapted to be folded downwardly and divergently inwardly into the carton as erected. These fold sections facilitate ease of insertion of the articles without bruising and regardless of nonuniformity of size of these articles. The portions of the top panel located between these fold sections arch upwardly above the articles, further protecting them from bruising during shipment and handling.

The present invention constitutes a modification of the cartons and carto' blanks described in these copending applications. My present carton structure, in addition to including in the top panel of the carton the aforementioned fold sections for receiving, retaining and protecting articles in individual compartments, also provides a modified carton configuration which enables the cartons to be shipped in a longitudinally upright condition. Fold sections for cradling the articles are hingedly connected to the panels of the carton so that the articles do not escape from their respective compartments when the carton is carried in this upright condition. The present carton is also provided with a sloping upper free end which avoids the possibility of improper shipment of the produce in an inverted position. A handle structure is provided in one of the carton panels so as to permit each carton to be carried in its properly upright condition.

The carton of my present invention is formed from a substantially rectangular blank comprising a continuous bottom panel and two or more vertical panels connected to the bottom panel. A top panel connects the vertical wall panels and may be either continuous or split, depending upon the blank configuration adopted from my aforesaid applications. Where a plurality of rows of stacked articles are to be packaged, an interior vertical panel is located between the side panels in the erected carton and connects with the top and bottom panel to provide two longitudinal compartments. A plurality of pairs of transverse fold sections are provided in the top panel. These transverse fold sections are adapted to fold downwardly and divergently inwardly into the interior of the erected carton about pairs of arched fold lines extending substantially transversely across the top panel. At least one of each pair of these transverse fold sections is hingedly connected to a side panel and functions to support or cradle, as well as to compartment, each article when arranged in vertically stacked relation to one another by upending the loaded carton. The upper extremity of the bottom panel of the upended carton has a handle structure provided therein so as to permit the carton to be gripped and carried. The end edges of the side walls (and of the longitudinal partition wall) adjacent the handle structure may be biased to lie in a plane other than a horizontal plane in order to assure that the carton will be shipped and handled in a proper upright position wherein each of the stacked articles is cradled by the hingedly connected fold sections.

These and other novel features of the carton structure of my invention will be further understood by reference to the accompanying drawings, in which

Fig. 1 is a transverse sectional view of the erected carton in its upright position;

Fig. 2 shows a representative portion of a blank from which the partition carton of my invention is formed; and

Fig. 3 shows a perspective partial view of the carton formed and erected from the blank of Fig. 2.

The carton blank **10** shown in Fig. 2 resembles in many respects the carton blanks described in my aforementioned copending applications. The blank is substantially rectangular in shape and is provided with longitudinal fold lines **11**, **12**, **13**, **14**, **15**, **16**, and **17** which divide the blank into serially arranged and integrally connected panels and glue flaps. The panels and flaps defined by these fold lines include a substantially centrally located bottom panel **18** having a pair of side panels **19** and **20** connected to the edges thereof. A pair of top panels **21** and **22** connect with the side panels **19** and **20** and have a number of pairs of transverse fold sections **23** and **24**. An interior panel **25** extends laterally from the top panel **21** and communicates with a glue flap **26** at one transverse extremity of the blank. Another glue flap **27** extends laterally from the other transverse extremity of the blank and, together with the glue flap **26**, may be coated with any suitable adhesive when the blank is folded into a knock-down condition.

Each pair of transverse fold sections **23** and **24** has a pair of longitudinal cutout lines **28** at the lateral outboard extremities thereof coinciding with fold lines **12** and **17**. A pair of bowed diverging transverse fold lines **29** extend across the top panels to define each pair of the fold sections **23** and **24**, and intermediate transverse cutout lines **30** also extend across the top panels and a section of their respectively adjacent side panels to divide the area defined by the bowed fold lines **29** into two separate fold sections. An oblique fold line **31** positioned in the side panels **19** and **20** hingedly connects each of the fold sections **23** to the side panels **19** and **20** between the terminals of one of the bowed fold lines **29** and the

cut line 30. A trough-shaped cut line 32, also positioned in the side panels 19 and 20, connects the terminals of the transverse cut line 30 and the other bowed fold line 29 defining the fold sections 24.

The transverse bowed fold lines 29 for each of the fold sections 23 and 24 are concave with respect to one another across the top panels 21 and 22. Each bowed line 29 includes a divergent distal fold line portion 33 at each of its lateral extremities and an intermediate transverse cut portion 34 converging towards the corresponding cut portion of the other bowed fold line 29 of each pair of fold sections. The longitudinal cut lines 28 and the portions of the longitudinal fold lines 13 and 16 intersected by each pair of bowed fold lines 29, together with diagonal fold lines 35 in each of the fold sections 23 and 24, permit the fold sections 23 and 24 to be folded downwardly and divergently inwardly into the interior of the erected carton.

A handle structure is provided at one longitudinal extremity of the bottom panel 18. This structure comprises a handle flap 36 hingedly connected to the body of the panel 18 along a fold line 37. The transverse edges of the side panels 19 and 20 proximate the transverse edge of this handle end of the panel 18 are cut at an angle, as at 38, such that the handle structure of panel 18 projects longitudinally beyond the transverse extremities of the top panels 21 and 22. The transverse edge of the interior panel 25 is also cut at an angle, as at 39, in order to bear the same relation to the top panels 21 and 22 as side panels 19 and 20.

The carton blank shown in Fig. 2 is transformed into a carton by first folding the glue flaps 26 and 27 about the proximate longitudinal fold lines 11 and 17. After an adhesive such as glue has been applied to these glue flaps and to a strip 45 along the bottom panel 18, the glue flap 26, the top panel 21 and the interior panel 25 are folded as a unit about the longitudinal fold line 13. The top panel 21 and the interior panel 25 thus overlie the side panel 19 and a major portion of the bottom panel 18, respectively, with the glue flap 26 adhering to the glue strip 45 of the bottom panel 18. Thereafter, the top panel 22 and the side panel 20 are folded as a unit about the longitudinal fold line 15 so that the glue flap 27 adheres to a portion of the interior panel 25 adjacent the fold line 12.

The carton blank is erected to the position shown in Fig. 3 by squeezing the side edges of the resulting carton structure until the side panels 19 and 20 and the interior partition panel 25 stand normal to the bottom panel 18.

The fold sections 23 and 24 in each pair thereof are then folded downwardly about their respective transverse fold lines 29, whereupon the remaining panel portions 40 located between the fold sections 23 and 24 in each of the top panels are arched upwardly to conform to the bowed configuration of the fold lines 29. Retaining lips 41 defined by the transverse cut lines 34 and remaining in the plane of the top panel thus project toward one another. A lateral slit 42 may be provided between the adjacent retaining lips 41 of proximate pairs of transverse fold sections so as to lie transversely across the convex protecting portions 40 of the top panels 21 and 22 and thus relieve the normal stiffness of these lips. A pair of cuts 34*a* and 34*b* may be provided at the lateral extremities of the transverse cut lines for each pair of fold sections. The cuts 34*a* and 34*b* hook inwardly toward the intermediate transverse cutout lines 30 and terminate in offset relation to the center of transverse cut lines 34. These reverse or hooked cuts 34*a* and 34*b* sufficiently weaken the body of the transverse fold sections 23 and 24 to assist them in maintaining their bowed condition between the side panels 19 and 20 and the interior partition panel 25.

Produce such as peaches, apples, and the like are then inserted into the compartments of the erected carton defined by the opposed pairs of fold sections and the adjacent interior and side panels. As such articles are inserted in

place, the lips 41 yield, both by reason of their slight longitudinal dimension and also by reason of the resiliency provided by the lateral slits 42; but when the lips 41 have returned to their normal position they effectively retain each article of produce within its respective compartment.

The bottom panel 18 may have a number of pairs of circular cut portions therein which define spaced pairs of tabs 46 loosely connected to the bottom panel. A suitable jig having pairs of pegs for registry with the tabs may be used to prebreak the flattened carrier carton prior to filling of the individual cells therein. The pegs inserted into the bottom panel through tabs 46 engage and support the top panel portions located between the distal fold line portions 33 to hold the erected carton structure substantially rigid. The fruit may then be pressed against the fold sections 23 and 24 into their respective compartments.

When the carton is fully packed, it can be gripped by pushing the handle flaps 36 out of the plane of the bottom panel 18. The carton can then be carried in a longitudinally upright or upended position. It will be noted that each of the fold sections 23, which form the lower supporting wall for each article in the upended carton, is hingedly connected along the fold line 31 to the side panels 19 and 20 and thus supports each article in the vertical column independently of the others. To increase the carrying area of the transverse fold sections 23, the central portion of each intermediate transverse cut line 30 may be arched, as at 43 in Fig. 2, in a direction toward the handle end of the carton. This arched-shape cut provides in the inwardly folded sections 23 an additional lip 44 serving to support the article in each compartment.

During shipment of the loaded carton, it is also desirable that the produce be packaged in individual compartments independently of one another and be suspended on the hinged transverse fold section 23. The angularly cut edges 38 and 39 of the side and interior panels 19 and 20 assure this result inasmuch as the loaded carton cannot be stood upright on its handle end. By providing these angularly cut edges 38 and 39 adjacent the handle end of the carton, it is only necessary for one of the transverse fold sections in each pair thereof to be hingedly connected to the side panels. However, both transverse fold sections of each pair may advantageously be hingedly connected to the side wall panels with resulting ease of erection.

Further, the transverse fold sections 23 and 24 in each of the pairs thereof may be provided with converging cuts of any suitable configuration emanating from transverse cut lines 34, and in lieu of cuts 34*a* and 34*b*. These converging cuts, in weakening the body of transverse fold sections 23 and 24 adjacent transverse cut lines 34, promote uniform separation of the fold sections from top panel portions 40 when folded about transverse fold lines 29, thereby reducing the possibility of twisting lips 41 out of their article-retaining position.

I claim:

1. A collapsible partitioned carton having a bottom panel, a pair of side panels extending upwardly from the sides of the bottom panel, at least one top panel positioned laterally adjacent at least one of the side panels, the top panel being provided with a plurality of pairs of fold sections, each of said pairs of fold sections being defined by a spaced transverse cut line and a pair of bowed transverse fold lines in the top panel opposedly spaced from but communicating with the later extremities of the transverse cut line, each of the bowed transverse fold lines including a central cut portion having a contour such as to project toward the central cut portion of the bowed transverse fold line defining the other fold section of each pair thereof, the extremities of said central cut lines extending inwardly of each fold section toward the intermediate transverse cut line separating each pair of fold sections whereby said fold sections are capable of being folded downwardly and divergently inward into the erect-

ed carton without causing folding of the portion of the top panel defined by the aforesaid central cut portion of each transverse fold line.

2. A collapsible partitioned carton comprising a bottom panel, a pair of side panels extending upwardly from the sides of the bottom panel, at least one top panel overlying the bottom panel and extending inwardly from the upper extremities of the side panels, the top panel being provided with a plurality of pairs of fold sections, said pairs of fold sections being defined by spaced transverse cut lines and bowed transverse fold lines in the top panel communicating with the lateral extremities of the transverse cut lines, the distal portions of the bowed transverse fold lines diverging from one another in each of said pairs of fold sections as they proceed inwardly from said side panels, the central portion of each bowed transverse fold line comprising a cut portion, the cut central portions of proximate bowed transverse fold lines of adjacent pairs thereof being spaced from one another so as to maintain a central transverse portion of the top panel between each pair of fold sections, each of said central transverse portions of the top panel between each pair of fold sections being provided with a transverse central cut line terminating short of the sides of the top panel, and the bottom panel being provided with a plurality of pairs of openings opposite the portions of the top panel located between the distal portions of adjacent pairs of said transverse fold lines and substantially outboard of the terminals of said transverse central cut lines of the top panel, whereby external supporting elements may be inserted through said openings and into supporting engagement with the under surface of said portions of the top panel while the fold sections are being folded downwardly into the interior of the carton.

3. A collapsible partitioned carton having a bottom panel, a pair of side panels extending upwardly from the sides of the bottom panel, at least one top panel positioned laterally adjacent at least one of the side panels, the top panel being provided with a plurality of pairs of fold sections, each of said pairs of fold sections being defined by a spaced transverse cut line and a pair of bowed transverse fold lines in the top panel opposedly spaced from but communicating with the lateral extremities of the transverse cut line, each of the bowed transverse fold lines including a central cut portion having a contour such as to project toward the central cut portion of the bowed transverse fold line defining the other fold section of each pair thereof, the extremities of said central cut lines extending inwardly of each fold section toward the intermediate transverse cut line separating each pair of fold sections whereby said fold sections are capable of being folded downwardly and divergently inward into the erected carton without causing folding of the portion of the top panel defined by the aforesaid central cut portion of each transverse fold line, and the bottom panel being provided with a plurality of pairs of openings opposite the portions of the top panel located between the distal portions of adjacent pairs of said transverse fold lines, whereby supporting elements may be inserted through said openings and into supporting engagement with the under surface of said portions of the top panel.

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