Nov. 16, 1954 C. M. SHANAHAN 2,694,504

BOTTLE CARRIER WITH PARTITIONS

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Fig. 1

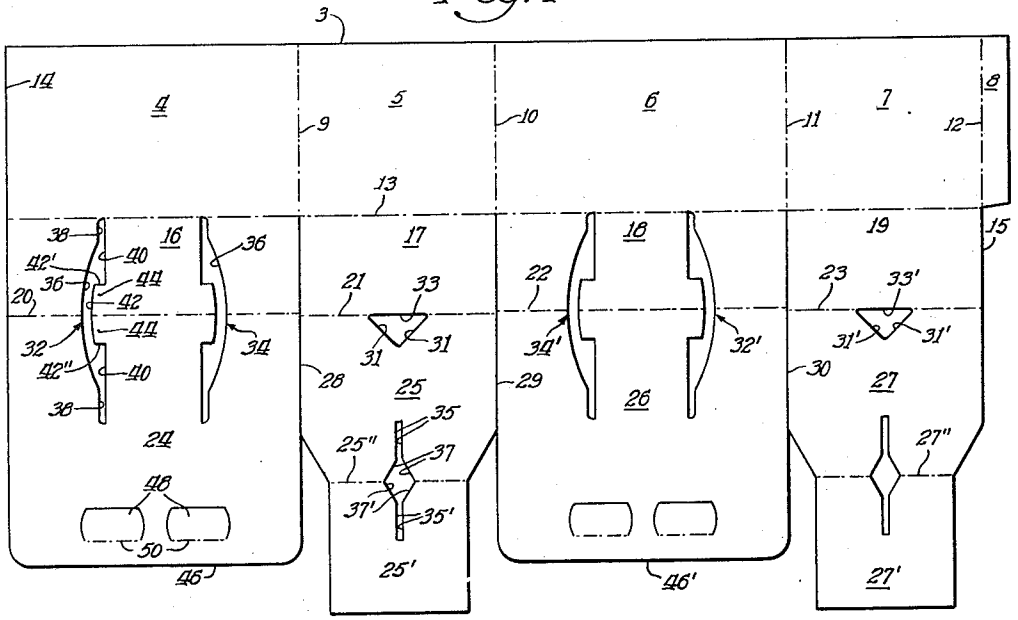
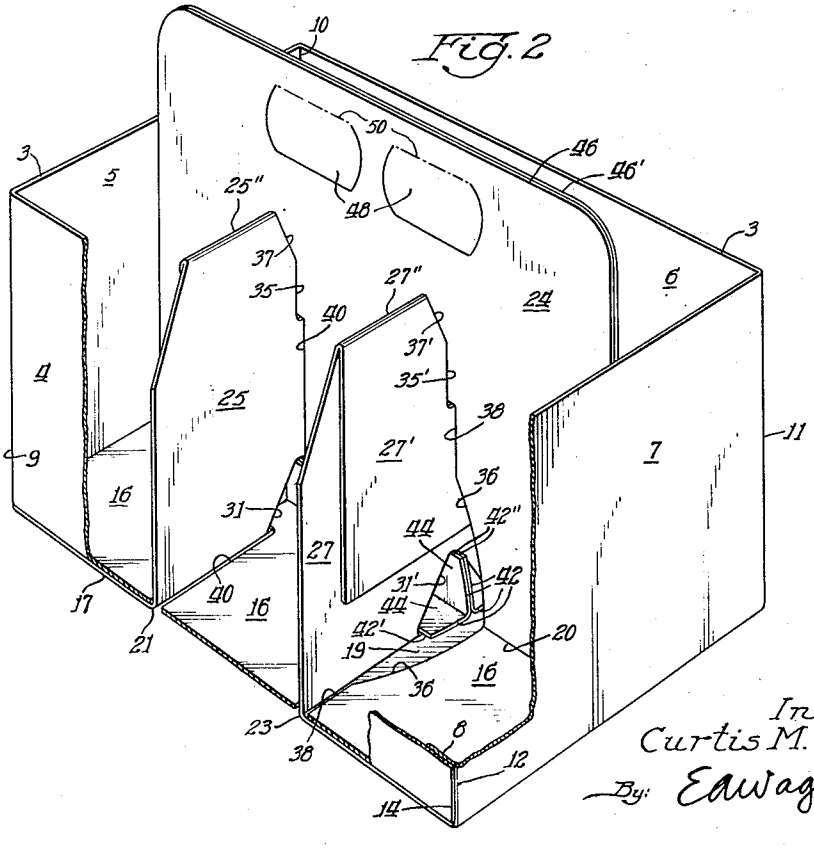


Fig. 2



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BOTTLE CARRIER WITH PARTITIONS

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7 Claims. (Cl. 220—111)

This invention pertains to carrier cartons, for bottles, cans and other articles and commodities, constructed from materials such as paperboard, strawboard and the like. More particularly the invention is concerned with the manufacture or construction of a simplified and exceptionally strong carton so made from a single integral piece of fibrous sheet material that it is susceptible of receiving and securing a plurality of filled or loaded bottles, cans or the like and of safely and securely supporting such items not only under static conditions but especially while the carton with its load is being carried by a handle part integral therewith.

One of the principal objects of the invention is to provide a carton of the character and material specified that it may be formed as a single, integral piece or blank of the material, so cut, scored, folded and secured that it may be stacked, shipped and otherwise handled in a flat or collapsed state and yet may quickly and easily be erected or "set-up" in final usable condition.

Another principal object is to provide a carrier carton wherein there are side, end and bottom walls, a combined partition and handle and one or more transverse partitions, all composed from a single integral blank or piece of material, the construction being such that the side and end walls are firmly and securely fastened to one another and to and through the bottom wall and partition structures to the handle, the bottom wall itself being of especially unique construction for strength and uniquely interengaged and interlocked with the handle, which also serves as a center partition, thereby to transmit the load directly and evenly to the handle for carrying purposes.

Still another important object is to provide an easily effected interlocking arrangement whereby the several partition members and the bottom wall may be fastened securely against accidental release and the carton, as a whole, may be made relatively rigid as well as strong and secure, once the carton has been "set-up" or erected and made ready for use.

A further important feature of the invention resides in the provision of a novel construction of those partitions which extend transversely of the main or center partition and handle whereby extra buffer or cushioning effects between containers, such as bottles, in adjacent compartments or cells, may be obtained, the inclusion or omission of this feature being optional.

Other objects including a special arrangement of certain of the score or fold lines with respect to others and other features of the carton to facilitate folding and erection of the final product, will become apparent and understood after reading the following description and claims and viewing the accompanying drawings in which:

Fig. 1 is a plan view of a blank from which a preferred form of the invention may be produced, the view showing the scored lines for folding and the slits and slots and other openings all of which have function purpose in forming and utilizing the resultant product; and

Fig. 2 is a perspective view of the carton formed or erected from the blank of Fig. 1, portions of one end and one side wall having been broken away to reveal the internal appearance.

The blank shown in Fig. 1 may be considered to be of rectangular shape in general. One marginal edge 3 which is straight is to become the upper marginal edge bounding each of the side walls to be formed by side wall panels 4 and 6, each of the end walls to be formed by end wall panels 5 and 7, and the glue flap 8. Lines of scoring, for folding each of the side and end wall

panels into box form of rectangular shape are designated 9, 10, 11 and 12, extend perpendicular to the edge 3 and parallel to one another from the edge 3 to a score line 13 which extends from one end edge 14 of the blank to its other end edge 15 in parallel relation to the edge 3, the edges 14 and 15 being parallel to lines 9, 10, etc. The score line 13 defines the bottom edge of each of the side and end walls in the carton when completed and the distance between edge 3 and score line 13 determines the height of each side and end wall. The distance between edge 14 and score line 9, the same as that between score lines 10 and 11, determines the carton length along its side walls and, similarly, the distance between score lines 9 and 10, which is equal to the distance between score lines 11 and 12, determines the carton width along its end walls.

Attached to wall panels 4, 5, 6 and 7 at the score line 13 are bottom wall forming panels 16, 17, 18 and 19, respectively, of which panels 16 and 18 are to become the inner or lapped panels of the bottom wall while panels 17 and 19 are to become the outer or lapping panels of the bottom wall when the carton is completed in its erected or "set-up" state. Connected to the panels 16 and 18 along aligned score lines 20, 22 which are parallel to score line 13, are center partition and handle forming panels 24 and 26, respectively, while connected to panels 17 and 19, along score lines 21 and 23, respectively are transverse partition forming panels 25 and 27. The panels 24 and 26 are similar to one another in size and shape as are panels 25 and 27 to each other but, as will be seen in Fig. 1, while score line 20 is aligned with score line 22 and 21 is aligned with 23, the latter two score lines are off-set to a greater distance from score line 13 than score lines 20 and 22 for a purpose to be described. Slits 28, 29 and 30, extending from score line 13 outwardly, separate and define the side edges of the several panels 16 and 24 from panels 17 and 25, the latter from panels 18 and 26 and the last from panels 19 and 27, respectively. The slits 28, 29 and 30 are aligned with score lines 9, 10 and 11, respectively.

Each of the transverse partition forming panels 25 and 27 includes an auxiliary or supplementary partition forming panel 25′ and 27′, respectively, connected thereto along the aligned score lines respectively designated 25″ and 27″. The panels 25′ and 27′ are similar in size and shape but preferably are so cut as to be of less width between their side edges than the corresponding dimensions between the edges of panel 25 formed by slits 28 and 29 and the edge formed by slit 30 and the opposite free edge of panel 27. Preferably also, the length of each of panels 25′ and 27 from a score line 25″ to the opposite and parallel free edge is somewhat less than the dimension of either of panels 25 and 27 from the score line 25″ to the score line 21 or 23, as the case may be but in no case should this dimension of the panels 25′, 27′ be greater than the corresponding dimension of panels 25, 27.

Extending to equal distances from score line 20 into the adjacent panels 16 and 24, are a pair of slots generally designated 32, 34. One portion of each of these slots extends completely across the panel 16 from score line 20 to score line 13 and is substantially symmetrical in shape and size with respect to the other portion extending into panel 24, the latter portion, however, being somewhat longer than the former. As between the two slots 32 and 34, each, as a whole, is reversely faced with respect to the other or, the mirror image of the other, as Fig. 1 reveals. The edge defining that boundary of each of slots 32 and 34 which lies closest to the edge 14 or that edge formed by slit 28, as the case may be, has a curved center portion 36 merging with aligned tangential portions 38 at its ends, while the opposite defining edge has aligned tangential end portions 40 parallel to the tangential portions 38 and an outwardly offset curved portion 42 connected to tangents 40 by portions 42′, 42″ between portions 40 to provide a pair of projections 44 delineated from one another by the score line 20 extending between them.

Preferably the minimum transverse width of each slot is somewhat greater than the thickness of the sheet material of which the carton is composed. Since the carrier carton is to have three compartments or cells for bottles

or other items on each side of the center partition, each of the slots **32, 34** is located substantially one third of the distance from the adjacent edge **14** or that formed by slit **28**, as the case may be, and preferably so that the aligned tangential portions **40** of each slot extend parallel to the edge **14** and that formed by slit **28** at a distance one third of that from one of such edges to the other. The slots **32'** and **34'** in panels **18** and **26** are similar in every respect to slots **32** and **34**, the slot **32'** being complementary to slot **32** and slot **34'** being complementary to slot **34**, as will appear more clearly as this description proceeds.

The outer end marginal edge **46** of one and **46'** of the other of the two center partition panels **24** and **26**, when the carrier carton is finally erected, will project well above the side and end walls to provide an easily accessible handle by which the carton and its contents may be carried. In order to provide for gripping by the hand of the user, the center partition panels **24, 26**, at conveniently spaced registerable places adjacent to their upper edges, are provided with the usual finger "push-outs" **48** each being of generally rectangular shape with three sides cut free from the panel and the fourth side hinged along a score line **50**.

Centrally of what will be the bottom edge portion of the transverse partition forming panel **25**, is an opening of triangular shape defined by edges **31, 31** and **33**, and a similar opening defined by edges **31', 31'** and **33'** is formed in panel **27**. The edges **31, 31** are of equal length and the apex angle formed by their junction is bisected by a line perpendicular to the edge **33** at its mid point and running medially of the panels **25, 25'** with respect to their side edges, such mid point also being the mid point of the base of panel **25** formed by the score line **21** and the edge **33** extending in alignment with the parts thereof. Edge **33** is of a length equal to or slightly greater than the distance between the edge portions **42', 42''** defining the side edges of the adjacent and connected projections **44, 44** when extended as shown in Fig. 1, while the perpendicular distance from the mid point of the edge **33** to the apex of the angle or juncture of side edges **31, 31** is equal to or slightly greater than one half of the length of edge **33** or equal to or slightly greater than one half of the distance between edges **42', 42''**, measured as before. Of course, if desired, a T-shaped slit or slot the head of which is positioned and of the same length as edge **33** and the stem of which is equal to the perpendicular distance from edge **33** to the junction of edges **31, 31**, may be substituted for the full opening, as will be apparent. The corresponding opening in panel **27** as defined by edges **31', 31'** and **33'** is similar in every respect to the opening in panel **25**.

Symmetrical with respect to the common median line of panels **25, 25'** and also symmetrical with respect to the fold or score line **25''** between these two panels is another slot defined in part by parallel edges **35** in panel **25**, in part by parallel edges **35'** in panel **25'** and in part by the edges **37** and **37'**, respectively of the panels **25** and **25'**, diverging from the respectively parallel edges **35, 35'** to their junctions at the fold or score line **25''**. The width of the narrow part of each end of such slot preferably is double or slightly greater than double the thickness of the material of which the carton is composed as such slot parts will receive a portion of each of the two center partition forming panels as will more clearly appear hereinafter. The length or depth of the slot in panel **25**, that is, the location of the inner end thereof from the fold or score line **25''**, is determined by the perpendicular distance from fold or score line **21** to score line **25''** and the correspondingly measured distance from the fold line **20** between panels **16** and **24** to the terminus of slot **34**, within panel **24**. In other words, the slot in panel **25** will have its blind or inner end terminated at such distance from score or fold line **21** as may be equal to or less than (but not greater than) the perpendicular distance to the terminus of either of the slots **34, 34'** from the either of the respectively adjacent score or fold lines **20, 22**, the length of the slot within the panel **25** being determined by the distance from the blind end of such slot from the fold line **25''**, the depth of the other half of such slot within panel **25'** being the same. The corresponding panels **27, 27'** are also provided with a corresponding slot which, since it corresponds in shape size and location with the slot in panels **25, 25'**, need not be described further.

After the blank of Fig. 1 has been cut and scored in the manner described, glue or other adhesive is applied over that face of glue flap **8** which is the "dress" or finished side or surface of the sheet and the flap is secured to that face of the side wall panel **4** which is its unfinished or opposite surface. If it be assumed that the blank of Fig. 1 has its finished surface facing away from the observer, adhesive will be applied over that surface of flap **8** which is also facing away from the observer. Although the application of adhesive and the various folding steps may be performed in any order of several, for the purposes of this description only one sequence, which may or may not be preferred depending upon machinery employed and other factors will be described.

Each of the panels **24** and **26** may be swung upwardly about its respective fold line **20** or **22** and over and down in face to face relation with panels **16** and **4** and panels **18** and **6**, respectively. Also each of panels **25** and **27** with their respectively attached panels **25'** and **27'** will be swung upwardly about its respective fold line **21** or **23** and over and down in face to face relation with panels **17** and **5** and **19** and **7**, respectively. Next the thus folded panels **4, 16** and **24** may be folded as one upward, over to the right and down about fold or score line **9** to lie upon panels **5, 6, 17, 18, 25, 25'** and **26** which have been folded as above described. Thereafter the panels **7, 19, 27** and **27'** as previously folded, together with the glue flap **8**, are folded as one upwardly, over to the left and down about the score or fold line **11** to lie upon the previously folded panels **6, 18** and **26** and the glue flap **8** may be tucked under the adjacent marginal edge of side wall panel **4** and secured thereto.

In its thus folded condition the carrier carton lies flat, and may be bundled in quantities, and so packaged, stored, shipped and otherwise handled. When a carton is to be erected or "set-up" for use, the operations to do so are simple indeed. First, by pressure applied from opposite directions against opposite ends of the flat carton, i. e. against fold lines **9** and **11**, the carton will be caused to expand to a generally rectangular tube whereupon the panels **25, 25'** and **27, 27'** may be unfolded or drawn out of the bottom of the tube. Then the center partition panels will be brought together in back-to-back contact and registration as those panels appear in Fig. 2, the attached bottom wall panels **16** and **18** being swung about the fold lines **13** and **20, 22**, respectively, to positions where their planes are at right angles to the planes of the side walls **4** and **6** and to the planes of the center partition panels **24** and **26**. At this time those halves of each of slots **32, 34, 32', 34'** in panels **24** and **26** will extend vertically and at right angles to the other halves in the bottom panels **16** and **18**, and one half of each projection **44—44** will lie in the horizontal plane of a bottom panel **16** or **18** while the other half of each such projection will lie in the vertical plane of that center partition panel with which it is connected. With the center partitions and bottom wall panels **16** and **18** so positioned and related the halves of slots **32** and **34** which extend into the panel **24** will mate or register with the respectively corresponding halves of slots **32'** and **34'** which extend into panel **26**. Similarly, the remaining halves of the same slots which extend into panels **16** and **18** will be brought into end to end abutting register.

The next step is to fold each of the auxiliary or supplemental transverse panels **25'** and **27'** about their respective score lines **24''** into face to face relation with respect to the adjacent panels **25** and **27**. While this folding may be in either direction, that is, to swing the panels **25', 27'** against either face of the respectively adjacent panels, it may be preferable so to make these folds that, in the finally erected carton the panels **25'** and **27'** will lie between the respective panels **25** and **27** and the respectively adjacent end wall panels **5** and **7** after the manner indicated in Fig. 2. Following the foregoing operations the folded edge (fold line **25''**) between either panels **25, 25'** or **27, 27'** is passed into the adjacent slot formed by the abutting registration of the halves of slots **32, 32'** or **34, 34'** and pushed upwardly therein until the registered blind ends of the slot **35—37** abuts the registered blind ends of the slot halves in the center partition panels **24, 26**. The procedure is repeated for the other transverse partition panels.

As the folded edge of a pair of transverse partition panels is entered in the bottom panel slots it may be bowed slightly to clear the abutting halves of mating or

registered projections 44. When the partition panels are disposed at their uppermost positions the projections 44 will enter the triangular openings in those panels and pass through them in which position the upwardly directed side edges 42'' will be in or substantially in edge engagement with the apex edge of the triangular opening in the main panel of the transverse partition as clearly shown in Fig. 2. At this same time the edges 42' of the adjacent registering projections will be in similar edge to edge or abutting engagement (or near engagement) with the edges of the main transverse panel at apices of the angles formed by edges 31 and 33, and the under or downward facing surfaces of the horizontal parts of projections 44 will overly and be in face to face contact (or near contact) with the upper or inside surface of the adjacent bottom panel 17 or 19, as the case may be. The resulting appearance is shown in Fig. 2.

Thus folded and erected or "set-up," the carrier carton is strong and rugged and firmly and securely supports its contents individually and collectively. The side walls are integral with the end walls offering mutual support to one another and the end walls abut against the adjacent end edges of the double-ply center partition finding support thereagainst. In the instant form approximately two-thirds of the bottom wall, upon which the load is to fall directly, is composed of two plies or thicknesses of the material of which one ply (the inner one) is composed of the two panels 16 and 18 each integrally joined to one of the side walls along its bottom edge, and of which the other (the outer ply) is composed of the two panels 17 and 19 similarly connected with the end walls. Those bottom wall panels, in turn, being integral with the center partition panels and with the transverse panels and being interlocked with one another against material lateral, longitudinal and vertical movements relative to one another by reason of the construction illustrated and described, provide an unusually rigid structure as will be appreciated. The interlock between the transverse and center partition panels with the projections 44 of the bottom panels 16 and 18 overlying and finding support from the bottom panels 17 and 19, lends support and strength to the bottom wall of each center compartment or article receiving cell so that those center cells, in effect, have a two-ply strength to a substantial degree.

The off-set score lines 21 and 23 increase the width of panels 17 and 19 to compensate for the fact that those panels overlap (under lap) parts of the panels 16 and 18 and thereby permit the transverse partition panels 25 and 27 to extend vertically and at right angles to the general plane of the bottom wall. The construction therefore facilitates insertion of the panels 25, 25' and 27, 27' through the slots in panels 16, 18 and upwardly to their final positions and aids in insuring that the interlock between the partitions is properly effected and will not accidentally be released. In a carton having side walls measuring 7⅝ inches each and end walls measuring 5 1/16 inches each, an off-set of each of score lines 21 and 23 from score lines 20, 22 in the amount of 1/16 of an inch has been found to be quite satisfactory using material of a thickness of approximately 1/32 of an inch.

The auxiliary panels 25', 27' may be omitted but when included provide an excellent cushioning means between articles, such as bottles, packaged in the compartments or cells of the carton, thereby preventing or minimizing the possibility of breakage due to impact of one article against another through a single wall thickness. These auxiliary panels may also aid to an extent in maintaining a firm interrelationship between the center and transverse partitions. If desired the auxiliary panels may extend further toward the bottom wall or be of greater width or both and other changes or modifications may be made therein. The push-out tabs 48 may remain in the planes of the respective center partition panels until the carton and its load are to be picked up for carrying, after the usual manner.

Various changes and modifications of essential features of the invention may be made and those features may be employed in other embodiments, as will be apparent to those skilled in the art, without departing from the invention spirit and the scope of the following claims.

1. In a carrier carton constructed from a single piece of material such as paperboard and including opposite end walls, opposite side walls, a bottom wall, a center partition wall extending between the end walls in spaced relation to each side wall and providing a hand grip at an upper portion thereof, and a second partition wall extending transversely of said center partition wall between said side walls in spaced relation to each end wall, that bottom and partition wall construction which comprises, a pair of bottom wall panels, one of said pair of bottom wall panels being integral with the bottom edge of one of said side walls and the other with the other of said side walls, a pair of panels forming said center partition, one of said center partition panels being integrally joined with one and the other with the other of said pair of bottom wall panels, each center panel and each bottom wall panel having a slot therein with the slot of each center panel opening into the slot in the bottom panel which is joined thereto, each center partition panel and the bottom wall panel joined thereto having a portion projecting from one edge defining the slot therein toward the opposite edge defining such slot and toward one end wall, said one of said end walls having an integrally connected panel underlying a part of each of said pair of bottom wall panels and said projecting portions, and a transverse-partition-forming panel integrally connected with said underlying panel and projecting upwardly through the said bottom wall panel slots and into the slots in said center panel and having an opening therein for passage of said projections therethrough.

2. A carrier carton construction as defined in claim 1 in which said transverse-partition-forming panel is doubled back upon itself along its upper edge.

3. A carrier carton construction as defined in claim 1 wherein the transverse-partition-forming panel is joined to said underlying panel along a scored line substantially coincident with said one edge defining the said slots in said bottom wall panels and said opening in said transverse-partition-forming panel is defined in part by an edge substantially aligned with said scored line.

4. A construction as defined in claim 1 in which scored fold lines delineate the said underlying panel from its connected end wall and transverse-partition-forming panel, in which scored fold lines delineate each of said pair of bottom panels from its connected side wall and center partition panels, and in which the first said fold lines are spaced from one another a greater distance than the distance between the last said fold lines.

5. In a carrier carton constructed from a single piece of material such as paperboard and including opposite end walls, opposite side walls, a bottom wall, a center partition wall extending between the end walls in spaced relation to each side wall and providing a hand grip at an upper portion thereof, and a second partition wall extending transversely of said center partition wall between said side walls in spaced relation to each end wall, that bottom and partition wall construction which comprises, a pair of bottom wall panels, one of said pair of bottom wall panels being integral with the bottom edge of one of said side walls and the other with the other of said side walls, a pair of panels forming said center partition, one of said center partition panels being integrally joined with one and the other with the other of said pair of bottom wall panels, each center panel and each bottom wall panel having a slot therein with the slot of each center panel opening into the slot in the bottom panel which is joined thereto, each center partition panel and the bottom wall panel joined thereto having a portion projecting from one edge defining the slot therein toward the opposite edge defining such slot and toward one end wall, said one of said end walls having an integrally connected panel underlying a part of each of said pair of bottom wall panels and said projecting portions, and a transverse-partition-forming panel integrally connected with said underlying panel and projecting upwardly through the said bottom wall panel slots and into the slots in said center panel to provide said second partition wall, the last said panel having an opening therein for passage of said projections therethrough, said last said panel having an edge portion which defines said opening disposed in overlying relation to said projection to limit direct downward movement of said second partition wall relative to said center partition wall.

6. In a carrier carton constructed from a single piece of material such as paperboard and including opposite end walls, opposite side walls, a bottom wall, a wall forming

a combined partition and handle extending between one pair of opposite walls in spaced relation to the other pair of opposite walls and a second partition wall extending transversely of the first said partition wall between said other pair of opposite walls and in spaced relation to the said one pair of opposite walls, that construction of said bottom wall and of said partition walls which comprises, a pair of bottom wall panels each connected with and extending from one of said one pair of opposite walls toward the opposite wall, each of said pair of bottom wall panels having an upwardly extending partition panel joined thereto, said upwardly extending panels being disposed in back-to-back relationship, each of said bottom wall panels having a slot formed therein extending from the line of junction with the upwardly extending panel joined thereto toward the wall with which such bottom wall panel is connected, each of said upwardly extending panels having a slot therein connected with the slot in the bottom wall panel joined thereto and extending upwardly toward the upper edge of such upwardly extending panel, the slots in said upwardly extending panels being substantially in register, a lapping bottom panel connected with one of said other pair of walls and underlapping a portion of each of said bottom wall panels, a transverse partition panel integrally connected with said lapping panel and extending upwardly through the slots in said bottom wall panels and into the slots in the first said partition panels, and means including a projection on one of the first said bottom wall panels and a registering opening formed in said transverse partition panel adjacent to said lapping panel for interlocking said partition panels and said bottom panels in their recited relationships.

7. In a carrier carton constructed from a single piece of material such as paperboard and including opposite end walls, opposite side walls, a bottom wall, a wall forming a combined partition and handle extending between one pair of opposite walls in spaced relation to the other pair of opposite walls and a second partition wall extending transversely of the first said partition wall between said other pair of opposite walls and in spaced relation to the said one pair of opposite walls, that construction of said bottom wall and of said partition walls which comprises, a pair of bottom wall panels each connected with and extending from one of said one pair of opposite walls toward the opposite wall, each of said pair of bottom wall panels having an upwardly extending partition panel joined thereto, said upwardly extending panels being disposed in back-to-back relationship, each of said bottom wall panels having a slot formed therein extending from the line of junction with the upwardly extending panel joined thereto toward the wall with which such bottom wall panel is connected, each of said upwardly extending panels having a slot therein connected with the slot in the bottom wall panel joined thereto and extending upwardly toward the upper edge of such upwardly extending panel, the slots in said upwardly extending panels being substantially in register, a lapping bottom panel connected with one of said other pair of walls and underlapping a portion of each of said bottom wall panels, a transverse partition panel integrally connected with said lapping panel and extending upwardly through the slots in said bottom wall panels and into the slots in the first said partition panels, and means including a projection on each of one of the first said partition panels and one of the first said bottom wall panels and a registering opening formed in said transverse partition panel adjacent to said lapping panel for interlocking said partition panels and said bottom panels in their recited relationships.

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