Aug. 18, 1959 S. J. LEONE 2,900,124

CARTON WITH TOP HANDLE

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FIG. 1

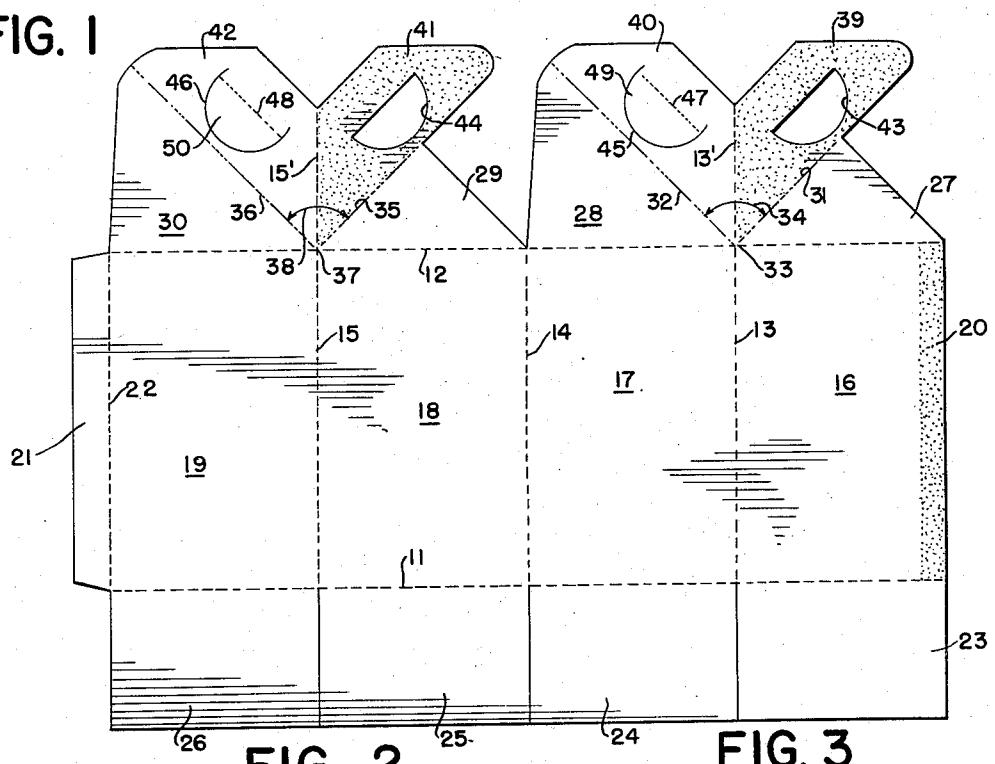


FIG. 2

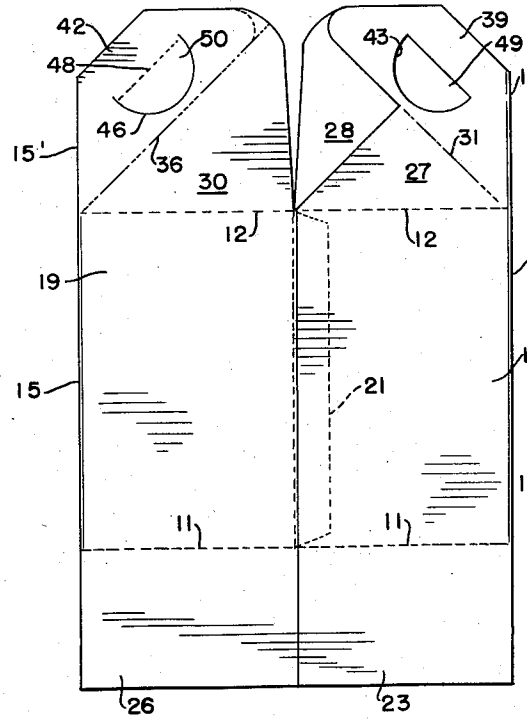
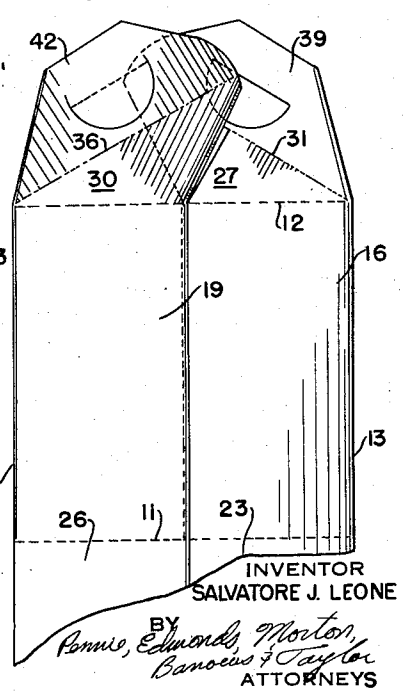


FIG. 3



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FIG. 4

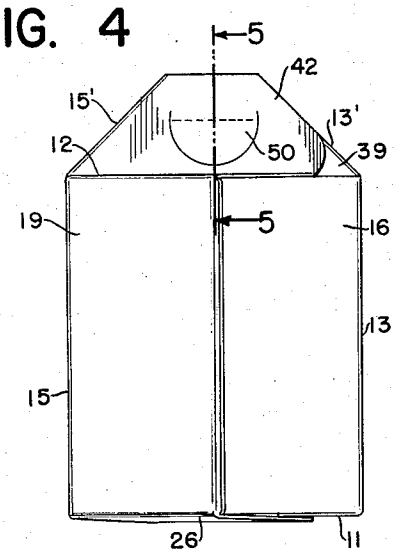


FIG. 5

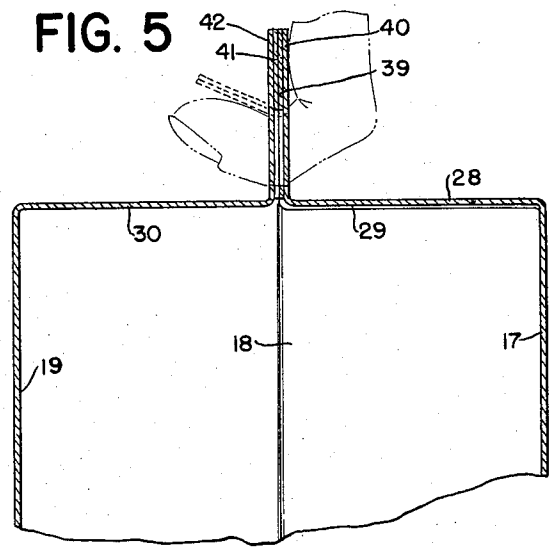
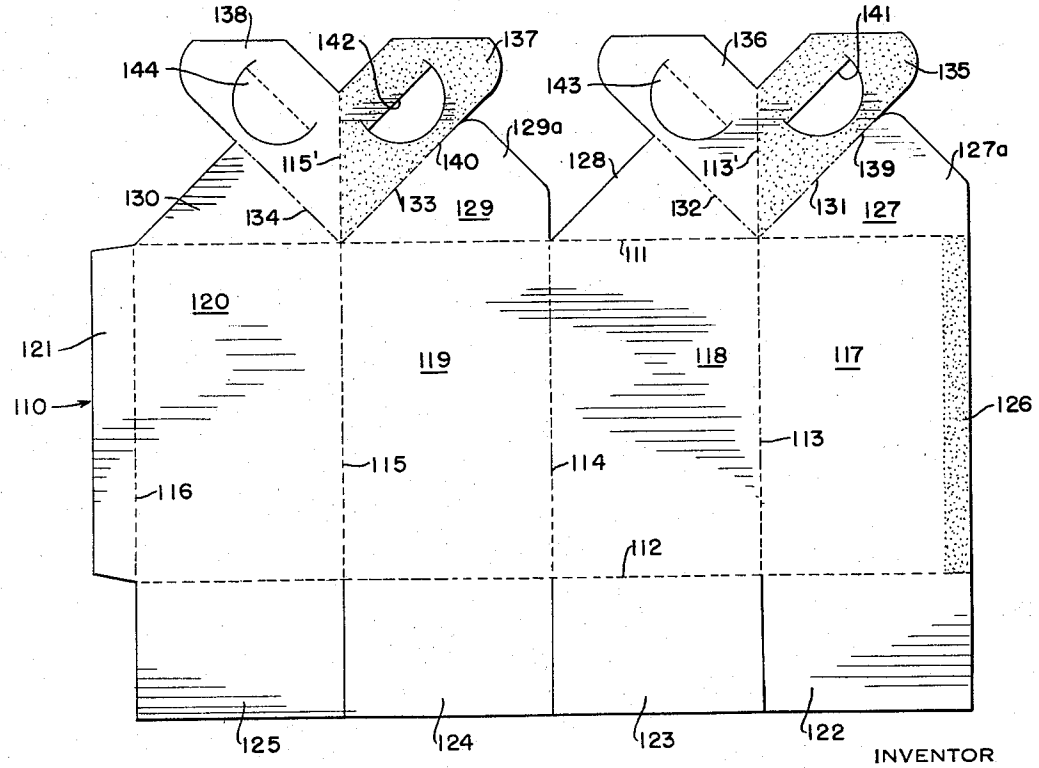


FIG. 6



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FIG. 7

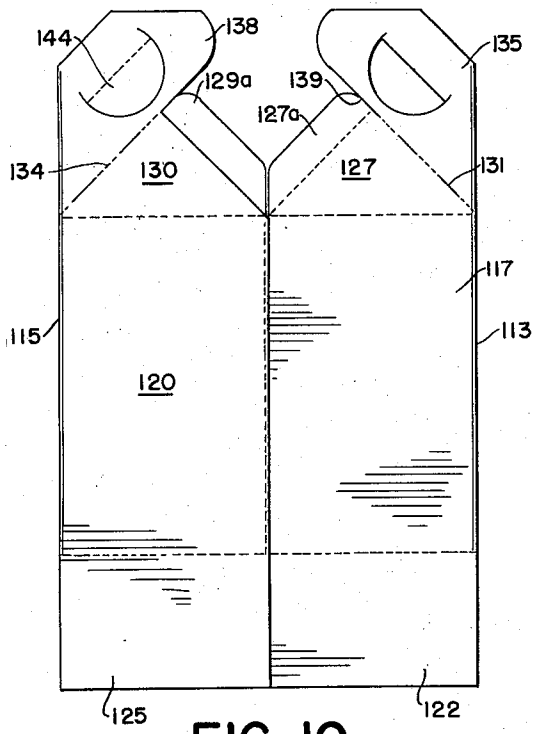


FIG. 8

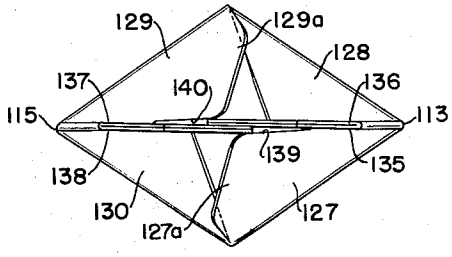


FIG. 9

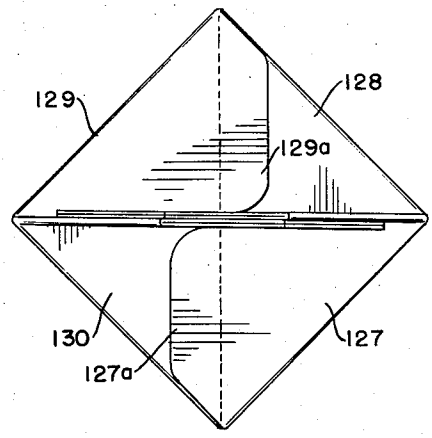
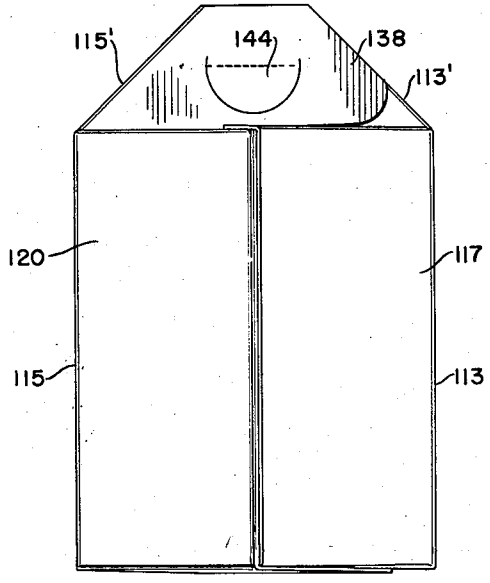


FIG. 10



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CARTON WITH TOP HANDLE

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Application April 11, 1958, Serial No. 727,965

9 Claims. (Cl. 229—52)

This invention relates to cartons, formed of paperboard or like material, and is concerned more particularly with top constructions for folding cartons, by which a top and handle are formed when a carton is erected.

The new construction is useful for cartons having rectangular bodies and provides, for such cartons, an improved top structure, comprising a top and a carrying handle, which are formed automatically when the carton is erected. The new carton may be formed of a single piece of board glued to form a flat tube, and flaps attached to the end of the tube fold, when the tube is squared, to become parts of a top and parts of a handle. The flaps forming the top and handle are so arranged that, when the carton is erected, the top flaps automatically fold over the top of the carton body and the handle flaps automatically form an upright carrying handle.

In the new carton, four top flaps are attached to respective side walls of a rectangular carton body and the top flaps are arranged in pairs with flaps of the respective pairs being attached to adjacent side walls. Handle flaps are attached to the top flaps and the handle flaps attached to the top flaps of a pair are glued together, so that each pair of top flaps has attached thereto a glued pair of handle flaps. The handle flaps are attached to the respective top flaps along lines which, when the carton is erected, extend diagonally across the top of the carton.

In one form of the new carton each pair of top flaps includes a flap which, in the erected carton, at least partially overlies a flap of the other pair, and the overlying flap of a pair and the handle flaps attached to that pair lie on the same side of the other pair of handle flaps. In a second form of the new carton each pair of top flaps includes an overlying flap, but the overlying flap and the handle flaps attached thereto lie on opposite sides of the other pair of handle flaps.

For a better understanding of the invention reference may be made to the accompanying drawings, in which:

Fig. 1 is a plan view of a blank used in making one form of the new carton;

Fig. 2 is an elevational view of a tube formed by folding and gluing the blank of Fig. 1;

Fig. 3 is an elevational view, with parts broken away, showing the manner in which the tube of Fig. 2 is erected to form a carton;

Fig. 4 is an elevational view of an erected carton formed with the blank of Fig. 1;

Fig. 5 is an enlarged, fragmentary, cross-sectional view taken on line 5—5 of Fig. 4;

Fig. 6 is a plan view of a blank used in making a second form of the new carton;

Fig. 7 is an elevational view of a tube formed by folding and gluing the blank of Fig. 6;

Fig. 8 is a plan view showing the manner in which the tube of Fig. 7 is erected to form a carton; and

Figs. 9 and 10 are plan and elevational views, respectively, of an erected carton formed with the blank of Fig. 6.

The carton of Figs. 1–5, incl., is made from a blank **10** divided by longitudinal creases **11**, **12** and transverse creases **13–15**, incl., into four connected side walls **16–19**, incl., and one of the walls at an end of the blank, such as wall **16**, may be provided with a glue area **20** along one edge while a wall **19** at the other end of the blank has a glue flap **21** attached along a crease **22**. In the illustrated blank, the respective side walls **16—19** are provided along their bottom edges with bottom flaps **23—26**, respectively, which may be folded to form a carton bottom. It should be understood, however, that the described bottom construction forms no part of the present invention and that any construction appropriate for the purpose may be employed.

Attached to the top edges of the respective side walls **16—19** are top flaps **27–30**, incl., of generally triangular shape, and the top flaps are arranged in pairs **27**, **28** and **29**, **30** with the respective flaps of a pair attached to adjacent side walls **16**, **17** or **18**, **19**. The flaps **27**, **29** are substantially identical and, in the illustrated carton construction, each flap is a right triangle with an area equal to about one-quarter of the cross-sectional area of the carton body and with a hypotenuse formed by the top edge of one of the side walls **16**, **18**. The flaps **28**, **30** are also substantially identical and are generally in the form of right triangles, each having an area equal to about half the cross-sectional area of the carton body and a hypotenuse of the length of a diagonal between opposite corners of the top of the carton body. The flaps **27**, **28** of one pair have edges defined by creases **31**, **32** which lie at angles to the crease **12** and meet at a point **33** where the creases **12**, **13** intersect, the creases **31**, **32** including between them an angle **34** of about 90°. Similarly, the flaps **29**, **30** of the other pair have edges defined by creases **35**, **36** meeting at a point **37** where creases **12**, **15** intersect and including between them an angle **38** of about 90°.

A pair of handle flaps **39**, **40** of generally trapezoidal shape and of the same size lie in the included angle between creases **31**, **32** and are connected together along a crease line **13'**, which is a prolongation of the crease line **13**. The base of the flap **39** is longer than half the length of a diagonal line across the top of the carton and is connected to a side edge of flap **27** along the crease **31**, and the base of flap **40** is likewise longer than half the length of a diagonal line across the top of the carton and is connected to a side edge of flap **28** along the crease **32**. A pair of handle flaps **41**, **42** of the same trapezoidal shape and size as flaps **39**, **40** lie in the included angle between creases **35** and **36** and have bases, which are longer than half the length of a diagonal of the top of the carton and are connected to side edges of flaps **29**, **30**, respectively, along creases **35**, **36**. Flaps **39**, **40** are connected together along a crease **15'**, which is a prolongation of crease **15**. One of the handle flaps **39**, **41** of each pair is provided in its central portion with a semi-circular cut-out **43**, **44**, while the other flap **40**, **42** of each pair is provided with a semi-circular cut **45**, **46** and a crease **47**, **48** forming a semi-circular tab **49**, **50**. The locations of the tabs **49**, **50** on the handle flaps **40**, **42** correspond to the locations of the cut-outs or openings **43**, **44** on the flaps **39**, **41**.

To convert the blank of Fig. 1 into a carton, the blank is first folded on the crease **15**, **15'** to bring the walls **18**, **19** face to face, and then along the crease **13**, **13'** to bring the walls **16**, **17** face to face. The glue area **20** is affixed to the glue flap **21** and the blank thus folded and glued forms a flat tube, as shown in Fig. 2. The respective handle flaps of each pair are also glued together

by glue applied to the handle flaps **39**, **41** and, when this is done, the top flaps of each pair connected to the top edges of adjacent side walls are connected by a pair of handle flaps glued face to face.

The tube of Fig. 2 is erected by pressing the creases **13**, **15** toward each other to square the side walls **16—19** and form a carton body of substantially square cross-section. As the walls **16—19** are squared, the pairs of top flaps **27**, **28** and **29**, **30** are drawn flat across the top of the carton body and, when the carton is fully erected, the creases **31**, **32** and **35**, **36** lie substantially in a plane across the top of the carton body and along a line extending diagonally from one corner of the top of the carton to the opposite corner.

In the erected carton, the top flaps **27—30** form a closed top and the larger flap **28**, **30** of each pair overlies the smaller flap **29**, **27** of the other pair. Also, in the erection of the carton, the connected handle flaps **39**, **40** pass over a side edge of the flap **29** to overlie that flap and the connected handle flaps **41**, **42** pass over a side edge of the top flap **27** to overlie that flap. Accordingly, in the erected carton, the pairs of handle flaps lie in registry so that one of the tabs **49**, **50** may be pushed through the openings **43**, **44** to lock the flaps together.

To assure that, when the carton is being erected, the pairs of handle flaps will pass each other without interference, the top flaps may be so shaped or dimensioned that the pairs of handle flaps move in planes slightly offset from the plane including the creases **13**, **15**. By way of example only, this may be accomplished by making the acute angles included between creases **12**, **31** and **12**, **35** slightly larger than those included between creases **12**, **32** and **12**, **36**.

The erected carton with the bottom flaps closed is substantially as shown in Fig. 4, and the pairs of handle flaps form a handle of trapezoidal shape extending diagonally across the top of the carton body. To facilitate stacking the erected cartons, the creases **31**, **32** and **35**, **36** may be partly scored or slit, so that the handle flaps hinge easily with respect to the top flaps.

The form of the new carton shown in Figs. 6–10, incl., is made from a blank **110** divided by longitudinal creases **111**, **112** and transverse creases **113–116**, incl., to form side walls **117–120**, incl., a glue flap **121**, and bottom flaps **122–125**, incl., a glue area **126** being provided along an edge of the wall **117**.

Attached to the top edges of the walls **117—120** are pairs of top flaps **127**, **128** and **129**, **130**, the flaps **128**, **130** being generally in the form of right triangles having their hypotenuses on the crease **11**, and the flaps **127**, **129** being similarly shaped and arranged except for the additional portions **127***a*, **129***a* thereof, which extend beyond the right-triangular outline. Adjacent edges of flaps of the respective pairs are defined by creases **131**, **132** and **133**, **134** meeting at the points of intersection of creases **111**, **113** and **111**, **115**, respectively. Creases **131**, **132** include between them an angle of about 90° as do creases **133**, **134**.

Pairs of handle flaps **135**, **136** and **137**, **138** are attached to the respective pairs of top flaps along creases **131–134**, incl., and the handle flaps are of generally trapezoidal shape and have portions projecting beyond edges of the top flaps. The creases **131—133** are partly scored, to facilitate hinging of the handle flaps, and the creases **131**, **133** are extended by cuts **139**, **140**. The handle flaps of the respective pairs are joined along creases **113′**, **115′** forming extensions of creases **113**, **115**, and the central portions of flaps **135**, **137** are provided with semi-circular cut-outs **141**, **142**, while semi-circular tabs **143**, **144** are provided in the central portions of flaps **136**, **138**.

To convert the blank of Fig. 6 into a carton, the blank is folded along creases **115**, **113** to form a tube, the glue flap **121** is affixed to the glue area **127**, and the handle flaps of the respective pairs are glued together by

glue on surfaces of the flaps **135**, **137**. The tube thus formed is shown in Fig. 7 and may be opened by pressing the creases **113**, **115** toward each other to square the side walls **117—120**. As the side walls move apart, the pairs of top flaps are folded automatically over the top of the carton body and the projecting portions **127***a*, **129***a* of the flaps **127**, **129** overlie portions of flaps **130**, **128**, respectively.

Drawing the top flaps across the top of the carton body causes the pairs of handle flaps to be drawn downward, substantially in a plane including the creases **113**, **115**, until the flaps overlap side by side with their bases in the plane of the top, and the overlapping pairs of handle flaps form a handle of generally trapezoidal shape extending diagonally across the top of the carton. The respective cutouts **141**, **142** and tabs **143**, **144** then lie in registry and one of the tabs may be pushed transversely through the cut-outs to interlock the pairs of handle flaps.

As illustrated in Figs. 8 and 9, the pairs of top and handle flaps are so arranged that, in the erected carton, the overlying flap **127** or **129** of a pair and the handle flaps attached to that pair lie on opposite sides of the other pair of handle flaps. Thus, the respective flaps may be so shaped or dimensioned that, as the handle flaps are drawn downward over the carton body, the handle flaps attached to one pair of top flaps travel in a plane offset slightly toward the overlying flap of the other pair of top flaps. When the carton is partly erected, as shown in Fig. 8, the handle flaps are received in the cuts **139**, **140** to permit the handle and top flaps to pass without interference.

Both of the described forms of the invention are characterized by a novel construction including top and handle flaps arranged, when the side walls squared, to fold automatically to form a closed top and a carrying handle. In addition, parts of respective pairs of handle flaps may be interengaged to lock the top and handle flaps in a desired manner.

I claim:

1. A carton having a top and a handle, comprising side walls connected together to form a body of rectangular cross-section, top flaps attached to the upper edges of respective side walls, each flap partially closing the upper end of the body and all the flaps having an edge lying along a common diagonal line extending across the end of the carton from one corner to the opposite corner, a pair of handle flaps connected together along a fold line and having edges longer than half the length of the diagonal line and connected to said diagonal edges of respective top flaps hinged to a pair of adjacent side walls, the handle flaps lying face to face and substantially at right angles to their associated top flaps, and a second pair of handle flaps connected together along a fold line and having edges longer than half the length of the diagonal line and connected to said diagonal edges of respective top flaps hinged to the remaining pair of adjacent side walls, the handle flaps of the second pair lying face to face and parallel to and in registry with the handle of the first pair.

2. The carton of claim 1, in which one handle flap of each pair is provided with an opening and the other handle flap of the pair is provided with a tab insertable into the opening, and the openings and tabs of the handle flaps of the two pairs lie in registry.

3. The carton of claim 1, in which one top flap of each pair at least partly overlies a top flap of the other pair.

4. The carton of claim 3, in which the overlying flaps are triangular in shape, and each overlying flap covers substantially one half of the top area of the carton body.

5. The carton of claim 1, in which one top flap of each pair at least partly overlies a top flap of the other pair, and the overlying flap of each pair and the handle flaps attached thereto lie on opposite sides of the handle flaps attached to the overlying flap of the other pair.

6. The carton of claim 5, in which the overlying top flap of each pair is joined to a handle flap along a crease, each such crease is extended by a cut, and each cut between a handle flap and a top flap receives parts of the handle flaps connected to the other pair of top flaps.

7. A carton, which comprises side walls connected together to form a body square in cross-section, flap means for closing the lower end of the body, top flaps arranged in pairs with the flaps of one pair connected to the top edges of two adjacent side walls and the flaps of the other pair connected to the top edges of the other two adjacent side walls, the top flaps of each pair closing approximately half the upper end of the carton body at one side of a diagonal and one flap of each pair substantially overlapping a flap of the other pair, and a pair of handle flaps connected to the adjacent edges of the top flaps of each pair and secured face to face, the pairs of handle flaps lying along a common diagonal lying across the top of the body and in registry.

8. The carton of claim 3, in which the overlying top flap of each pair and the handle flaps attached thereto lie at the same side of the other pair of handle flaps.

9. A blank for a carton, which comprises a series of four side wall panels connected side by side along crease lines, a glue flap connected to the panel at one end of the series, flap means for closing the lower end of the carton

connected to the lower ends of the panels, a pair of top flaps connected along fold lines to the upper edges of a pair of adjacent side wall panels, each of the top flaps being of a size to close at least one-quarter of the upper end of the carton side walls when connected together to form a body of rectangular cross-section and one of the top flaps being of greater area than the other, a second pair of top flaps of the same shape and size as respective top flaps of the first pair and connected along fold lines to the upper edges of the pair of remaining side wall panels, a pair of handle flaps connected together along a fold line and lying between and having edges connected to adjacent edges of respective top flaps of the first pair, and a second pair of handle flaps connected together along a fold line and lying between and having edges connected to edges of respective top flaps of the second pair.

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