Aug. 20, 1957 P. A. TOENSMEIER 2,803,393

BOTTOM CONSTRUCTION FOR FOLDING CARTONS

Filed April 11, 1956 3 Sheets-Sheet 1

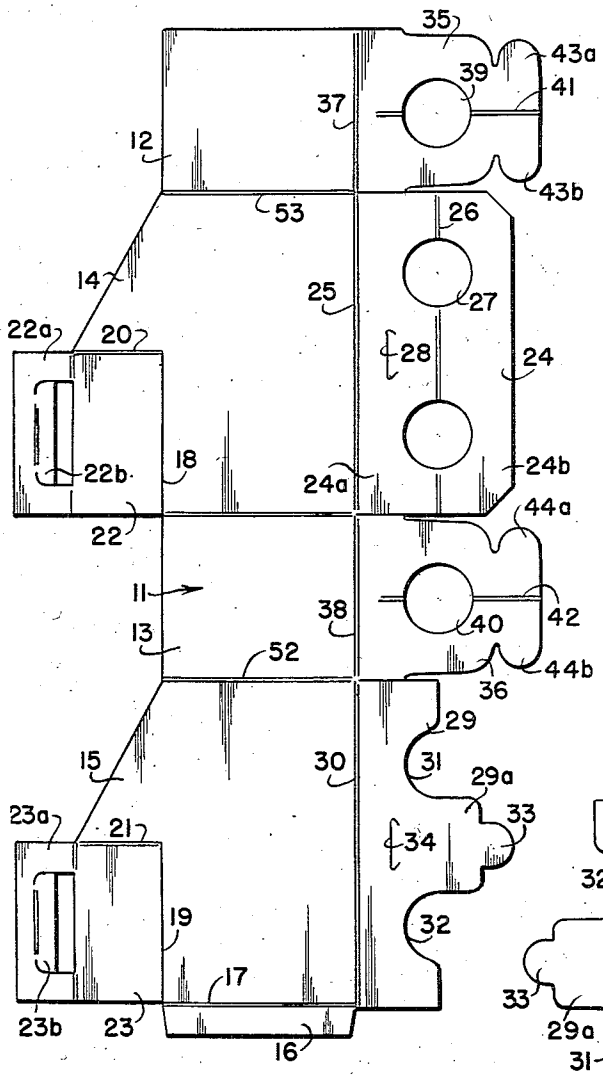


FIG.1

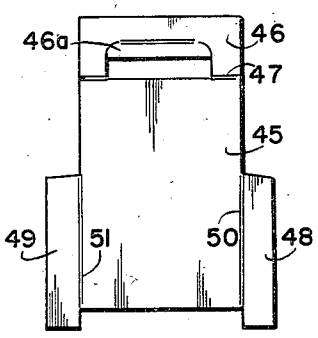


FIG.3

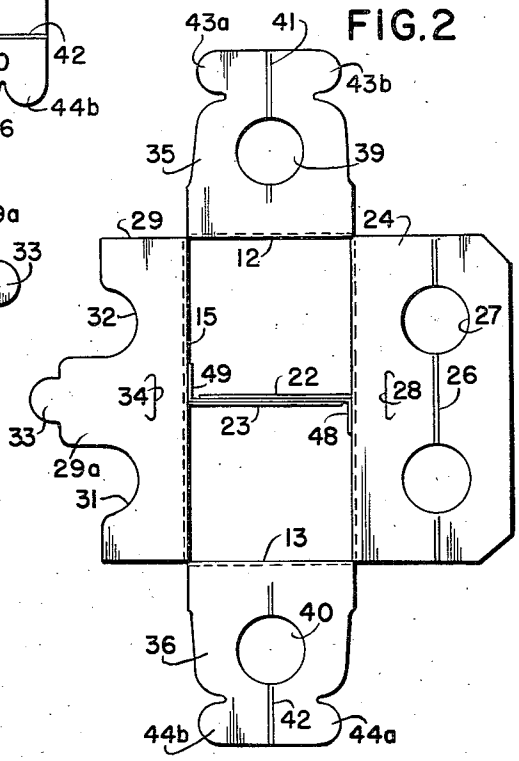


FIG.2

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BOTTOM CONSTRUCTION FOR FOLDING CARTONS

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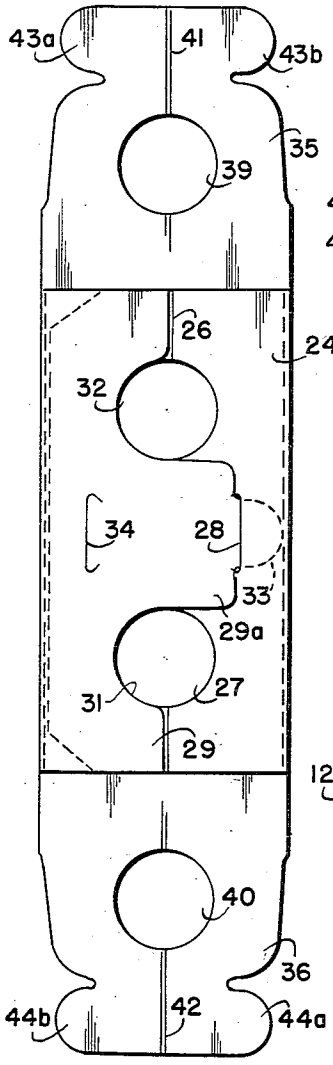


FIG.4

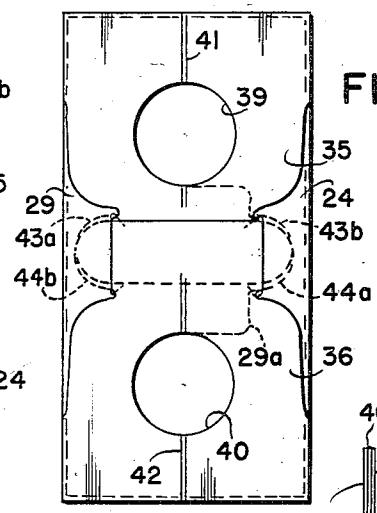


FIG.5

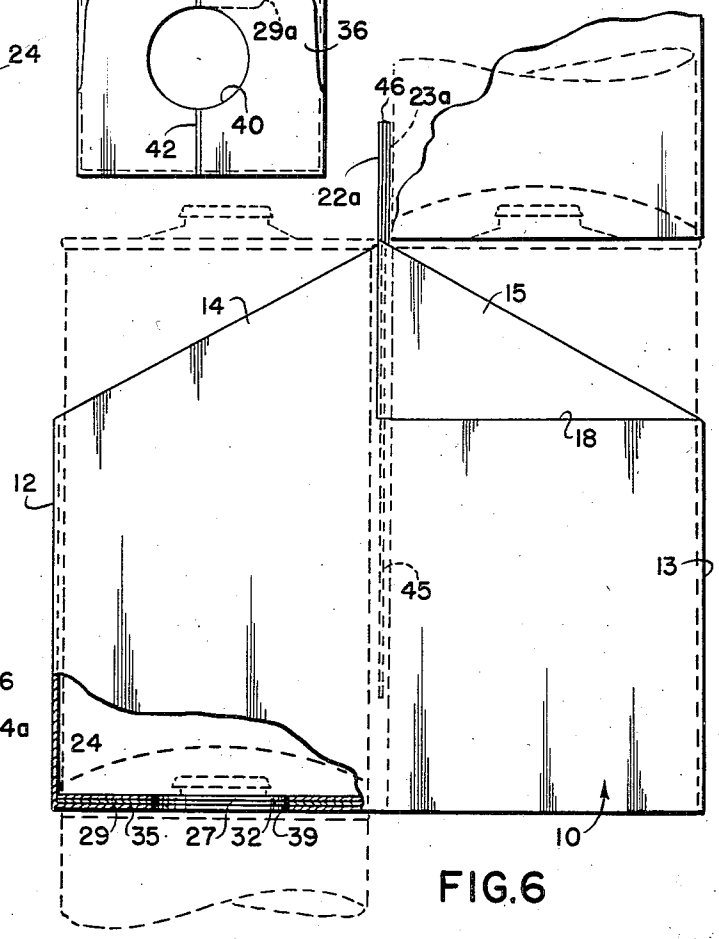


FIG.6

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BOTTOM CONSTRUCTION FOR FOLDING CARTONS

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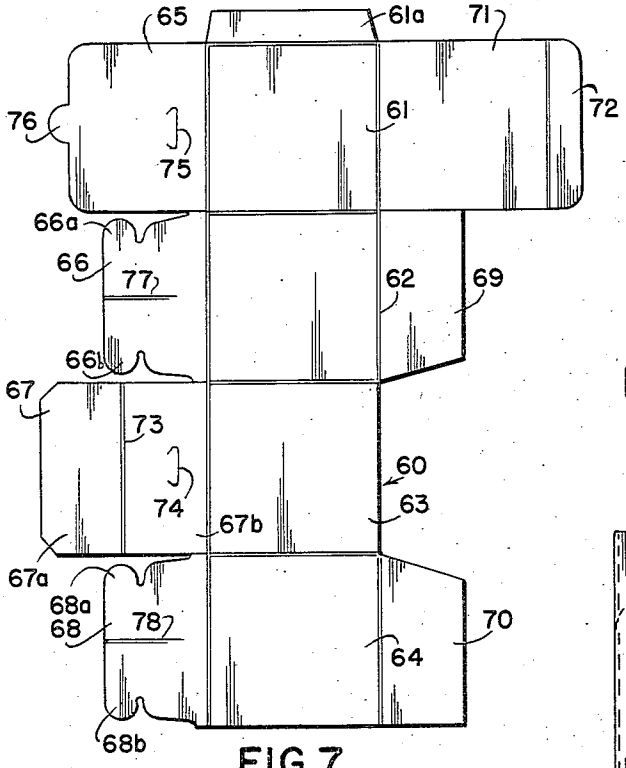


FIG.7

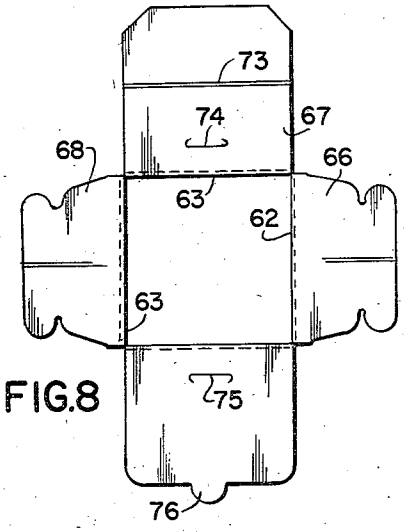


FIG.8

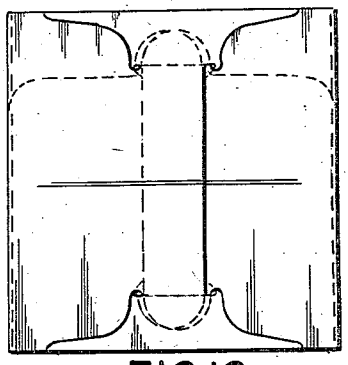


FIG.10

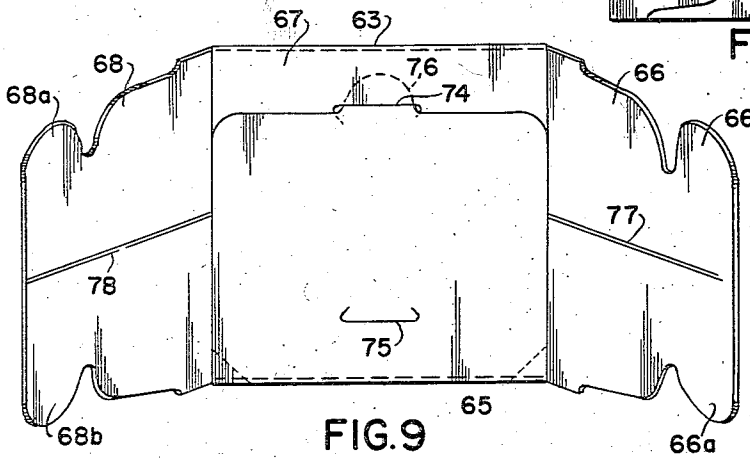


FIG.9

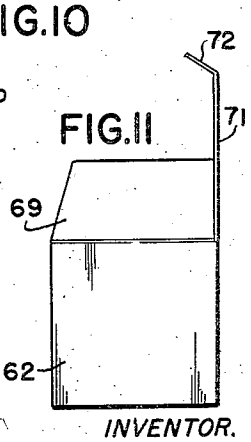


FIG.11

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BOTTOM CONSTRUCTION FOR FOLDING CARTONS

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Application April 11, 1956, Serial No. 577,609

7 Claims. (Cl. 229—39)

This invention relates to folding paperboard cartons adapted to be shipped in a flat condition and erected at the point of use, and is concerned more particularly with a novel bottom construction for a folding carton, which comprises a plurality of flaps hinged to the vertical walls of the carton and adapted to be connected together to form an unusually strong durable multi-ply bottom.

A carton with the new bottom structure may be used in a variety of ways, as, for example, a carrier for a plurality of bottles or like articles, and the carton is primarily intended for use in carrying relatively heavy loads. Accordingly, the improved bottom wall structure comprises bottom flaps hinged to the walls of the carton and foldable upon one another and held in place by tongue and slot connections. The connections are so formed that each slot receives a plurality of tongues and the tongues on the outer pair of flaps interlock with their slots. Because of the number of tongues entering each slot, the interlocking tongues are held firmly in place and, as a result, the bottom structure is capable of supporting heavy weights. In addition, the flaps are so formed that holes may be cut in them without weakening the bottom structure and such holes are useful in can or bottle carriers, since they permit the loaded carriers to be stacked with the cans or bottles in lower containers directly supporting the cans or bottles above.

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 for a typical carrier carton incorporating the new bottom wall structure;

Fig. 2 is a bottom plan view of an erected carrier formed from the blank of Fig. 1, the bottom flaps being bent outwardly;

Fig. 3 is a plan view of a blank for a handle used in the carrier;

Fig. 4 is a bottom plan view of the carrier with the inner pair of bottom-forming flaps in operative position;

Fig. 5 is a bottom plan view of the carrier showing the completed bottom wall structure;

Fig. 6 is a front elevation of the carrier with parts broken away illustrating the manner in which the loaded carrier may be stacked;

Fig. 7 is a plan view of a blank for a typical carton incorporating the improved bottom wall structure of the invention;

Fig. 8 is a bottom plan view of an erected carton formed with the blank of Fig. 7, the bottom flaps being folded outwardly;

Fig. 9 is a perspective view of the carton with the inner bottom flaps in operative position;

Fig. 10 is a bottom plan view of the carton showing the completed bottom wall structure; and

Fig. 11 is a side elevational view of the carton with the cover open.

The carrier carton 10 shown in Fig. 6 is intended for carrying two large beverage containers, such as quart cans, and is made from the blank 11 of paperboard material shown in Fig. 1. The blank 11 is cut and creased to form end walls 12, 13, side walls 14, 15 and a glue flap 16 hinged to the free edge of the side wall 15 along a crease line 17. The upper ends of the side walls 14, 15 (at the left in Fig. 1) are cut along horizontal lines 18, 19 extending half-way across the walls and the walls have vertical creases 20, 21 extending outward from the inner ends of the cuts to form handle flaps 22, 23 hinged to the side walls 14, 15 along the crease lines 20, 21, respectively. The handle flaps have end sections 22*a*, 23*a* connected to the flaps along transverse crease lines and the flaps have cuts defining internal flaps 22*b*, 23*b*, which may be swung out of the plane of their flaps 22, 23 to form hand hold openings.

A bottom flap 24 is connected to the lower edge of side wall 14 along a crease line 25 and the flap is of a length about equal to the width of an end wall and has a transverse crease 26 about midway between its free and root edges dividing the flap into panels 24*a*, 24*b*. In the illustrated blank, the flap 24 has a pair of circular openings 27 spaced from its side edges and centered on the crease line 26 and the panel 24*a* of the flap has a slot 28 located about half-way between the ends of the flap 24. The slot 28 is generally U-shaped and it has a portion extending parallel to the crease line 26 and end portions lying at an angle to the crease line.

A bottom flap 29 is hinged to the lower edge of the side wall 15 along crease line 30 and the flap 29 has a width equal to that of the flap 24 and spaced semicircular recesses 31, 32 in its end edge. The central portion 29*a* of the flap 29 extends beyond the circular recesses 31, 32 and terminates in a tongue 33 receivable in the slot 28 in flap 24. A slot 34 is formed in flap 29 and is similar in shape and location in the flap to the slot 28 of the flap 24.

A pair of flaps 35, 36 are hinged along crease lines 37, 38 to end walls 12, 13, respectively. The flaps 35, 36 are substantially identical and have central circular openings 39, 40 and lengthwise median crease lines 41, 42. The side edges of the flaps 35, 36 are notched near the free ends of the flaps to form pairs of tongues 43*a*, 43*b* and 44*a*, 44*b* extending outwardly from the flaps, parallel to their roots, with the tongues of each pair lying spaced from the root of their flap a distance equal to about one half the width of a side wall panel.

The blank of Fig. 3 is adapted to form a combined partition and handle for the carrier made from the blank of Fig. 1 and has a main panel 45, a handle 46 hinged to one end of the main panel along a crease line 47, and glue flaps 48, 49 hinged to the side edges of the main panel along crease lines 50, 51. The handle 46 is substantially identical to the end sections 22*a*, 23*a* of the handle flaps 22, 23 and handle 46 has a cut forming an internal flap 46*a* similar to flaps 22*b*, 23*b*.

In gluing up the blank 11 and securing the blank of Fig. 3 in place, the blank 11 is laid flat with its inner face up and is fed through the gluing and folding machine, to which the blank of Fig. 3 is separately fed. In the machine, glue is applied to the appropriate surfaces of the blanks and the blank 11 is so folded that the outer surface of the glue flap 16 is secured to the inside surface of the end wall 12. During this operation, one face of the glue flap 49 is secured to the inner surface of the side wall 14, the opposite face of the glue flap 48 is secured to the inner surface of the side wall 15, and the handle 46 is placed between and secured to the handle flaps 22, 23. The glued carton emerges from the machine as a flattened tube with walls 13, 14 lying in a plane and face to face with walls 12, 15 also lying in the plane.

To erect the carrier, force is applied to the tube on crease lines 52, 53 lying between walls 13, 15 and 12,

14, respectively. The sections of the blank then move apart, so that the end walls 12, 13 lie at right angles to the side walls 14, 15 and the handle flaps 22, 23, and panel 45 lie at right angles to the side walls 14, 15. When the carrier is thus squared, the bottom flaps lie in the planes of their supporting walls.

To close the bottom of the carrier, the flap 24 is turned in over the bottom end of the tube and the flap 29 is turned in to lie against the outer surface of the flap 24. Pressure is then applied to the flaps to force them inwardly so that the tongue 33 slides over the flap 24 and becomes aligned with the slot 28 therein. Upon release of the pressure, the tongue 33 automatically enters the slot 28 and interlocks the flaps 24, 29 in the position shown in Fig. 4. As the flaps 29, 24 are bent inwardly, when pressure is applied thereto, the free end of the flap 24 will engage the lower edge of the handle panel 45. The further application of pressure will cause the flap 24 to buckle slightly and the crease line 26 permits this to occur without damage to the flap.

After the flaps 24, 29 are folded and interengaged, the flaps 35, 36 are folded successively inward over flaps 24, 29, so that the tongues 43*a* and 44*b* overlie slot 34 and tongues 44*a* and 43*b* overlie slot 28. Pressure is then applied to the overlapping portions of the flaps 35, 36 to deform the flaps inwardly until the ends of tongues 43*a*, 44*b* and 44*a*, 43*b* are aligned with slots 34 and 28, respectively. Upon release of the pressure, tongues 43*a*, 44*b* enter slot 34 and tongues 44*a*, 43*b* enter slot 28. The bottom flaps are then locked in place as shown in Fig. 5 and the bottom structure is completed. The crease lines 41, 42 in the flaps 35, 36 permit the flaps to be distorted as described, so that the tongues may freely enter their slots.

The completed bottom structure is of great strength, since it is made of several layers of paperboard and a plurality of tongues are received in each of the slots 28, 34, so that the tongues are firmly held in place. Thus, the slot 28 receives tongues 33, 43*b* and 44*a*, while the slot 34 receives tongues 43*a* and 44*b*. The tongues 43*b*, 44*a* and 43*a*, 44*b* enter the slots 33, 34 at right angles to the roots of the flaps 24, 29 so that the flaps 35, 36 are locked against movement lengthwise of the carton.

The carrier shown is adapted to receive two quart beverage cans of the type having a cone top closed by a cap and inwardly domed bottom and the handle projects a short distance above the top of the chimes of the cans as indicated in Fig. 6. This facilitates gripping of the handle and, when loaded carriers are to be stacked upon one another, the handles of a lower carrier can be folded over to rest upon the chime of a can at one side of the cap. When another carrier is to be stacked upon the first, the upper carrier rests upon the chimes of the cans in the lower carrier and the caps of the cans enter the openings in the bottom of the upper carrier.

The carton shown in Fig. 11 is made from a blank 60 creased to form four like connected side walls 61–64, incl., and a glue flap 61*a* hinged to wall 61. Bottom flaps 65–68, incl., are hinged to the lower edges of the respective side walls 61–64 and the flaps 65, 67 constitute one pair while flaps 66, 68 constitute another pair. Closing flaps 69, 70 are hinged to the upper edges of walls 62, 64 and a cover 71 having a tuck flap 72 is hinged to wall 61.

The bottom flap 67 is of a length equal to the width of a side wall and is divided by a transverse crease line 73 into panels 67*a* and 67*b*. The inner panel 67*b* has a generally U-shaped slot 74 midway between its side edges with the ends of the slot extending toward the crease line 73. The flap 65 has a slot 75 similar in size, shape, and location to the slot 74 and also has a tongue 76 projecting outwardly from the middle of its free end edge. Flaps 66, 68 are substantially identical and have pairs of tongues 66*a*, 66*b* and 68*a*, 68*b* projecting from their side edges and crease lines 77, 78 extending along central axes of the flaps from the free edges thereof.

In gluing up the blank 60, glue is applied to appropriate surfaces of the blank and the blank is folded along crease lines between adjacent side walls to cause the glue flaps 61*a* to be secured to the inner face of the side wall 64. The carton emerges from the machine in the form of a flattened tube and may be shipped and stored in flat condition. The carton is erected at the point of use by squaring the tube, after which the bottom structure of the carton is completed. For this purpose, the flap 67 is first folded inward over the bottom of the tube and the flap 65 is folded to overlie the flap 67. Pressure is then applied to the central portions of the flaps 65, 67 to deform the flaps inwardly and bring the end of the tongue 76 into alignment with the slot 74 and, upon release of the pressure, the tongue 76 enters the slot 74. Flaps 66, 68 are next folded in over flaps 65, 67, so that the pairs of tongues 66*a*, 66*b* and 68*a*, 68*b* are face to face and overlie the slots 74, 75. Upon application of pressure to the center portion flaps 66, 68, the tongues 66*b* and 68*a* are aligned with the slot 74 and the tongues 66*a*, 68*b* are aligned with the slot 75. Release of the pressure causes the tongues to enter the slots at right angles to the roots of the flaps 65, 67 of the first pair to complete the bottom structure. The completed carton is illustrated in Fig. 11 with the closing flaps and cover open.

As will be apparent from the foregoing, the carton bottom of the invention may be incorporated in cartons of various forms and is employed with particular advantage where heavy objects or loads must be supported. In the new structure tongues of a number of flaps are received in a single slot in another of the flaps so that the edges of the slots tightly grip the tongues. In addition, the tongues on the outer flaps lie at right angles to the roots of the inner flaps so that the tongues are effectively interlocked with the slots. By forming the outer flaps so that they overlap and their tongues enter the same pair of slots, areas of the bottom at each side of the overlapped portions of the outer flaps are available for removal to form openings for receiving can or bottle caps, when the loaded carriers are stacked.

I claim:

1. A carton having connected vertical walls defining a tube, and a bottom formed of a pair of flaps hinged to the lower edges of opposed walls and folded inwardly one over the other to close the bottom of the tube, each flap having a slot parallel and adjacent to the root of the flap about midway between the side edges of the flap and one of the flaps having a tongue projecting from its free edge and entering the slot in the other flap, and a second pair of flaps hinged to the lower edges of the remaining walls of the tube and each having a pair of tongues projecting from its side edges near its free end, the flaps of the second pair being folded and overlying the infolded flaps of the first pair with the free ends of the flaps of the second pair overlapping and with the tongues thereof in registry and inserted into the slots in the flaps of the first pair.

2. The carton of claim 1 in which the flaps of the second pair overlap over relatively narrow transverse areas at the free ends of the flaps and the flaps of both pairs are cut away to provide openings through the bottom on opposite sides of the overlapping areas.

3. The carton of claim 1 in which the slots in the flaps of the first pair are formed by generally U-shaped cuts having long central portions parallel to the roots of the flaps and end sections extending toward the free end edges of the flaps, and the tongues on the flaps of the second pair enter the slots at right angles to the roots of the flaps of the first pair and parallel to the roots of the flaps of the second pair.

4. A carton blank having a pair of side walls and a

pair of end walls arranged alternately in alignment and connected along transverse parallel fold lines, flaps extending from each of said walls along the same side of the aligned walls, said flaps being connected to their respective walls along fold lines, the length of the flap extending from one of the side walls being substantially the width of an end wall and having a slot substantially midway between the side edges thereof and substantially parallel to and adjacent the root side thereof, the flap extending from the other side wall having a slot substantially midway between the side edges thereof and substantially parallel to and adjacent its root side, the free edge of said last-named flap having a tongue substantially opposite the slot in said flap, said flaps, when the carton is assembled, being adapted to overlie one another and the tongue of the last-named flap being adapted to enter the slot of the first-named flap, the flaps extending from the end walls having tongues extending from each of the sides thereof adjacent their outer ends, said last-named tongues being spaced from the root sides of the respective end flaps a distance substantially equal to the distance of the slots in the side wall flaps from the sides of such flaps, so that when the flaps secured to the side walls are folded inwardly into overlapping relationship with the tongue on one side wall entering the slot of the other side wall, and the end flaps are folded inwardly, the ends of the end flaps will overlie one another and the tongues at the respective sides of the end wall flaps may enter the slots in the respective side wall flaps.

5. The carton blank of claim 4 in which the end wall flaps are of such length as to overlap only relatively narrow transverse areas at their free ends when they are folded inwardly into overlapping relationship, and both of the end and side flaps are cut away to provide openings through the bottom on opposite sides of the overlapping areas when the carton is assembled.

6. The carton blank of claim 4 in which said side wall flap which is substantially the width of an end wall has a fold line extending substantially parallel to the root side of said flap, and both of the end wall flaps have a fold line extending substantially normal to their root sides.

7. The carton blank of claim 4 in which the slots in the side wall flaps are formed by generally U-shaped cuts having long central portions parallel to the root sides of the flaps and end sections extend toward the free end edges of the flaps, and the tongues on the end wall flaps are adapted to enter the slots at right angles to the root side of the end wall flaps and parallel to the root side of the side wall flaps.

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