

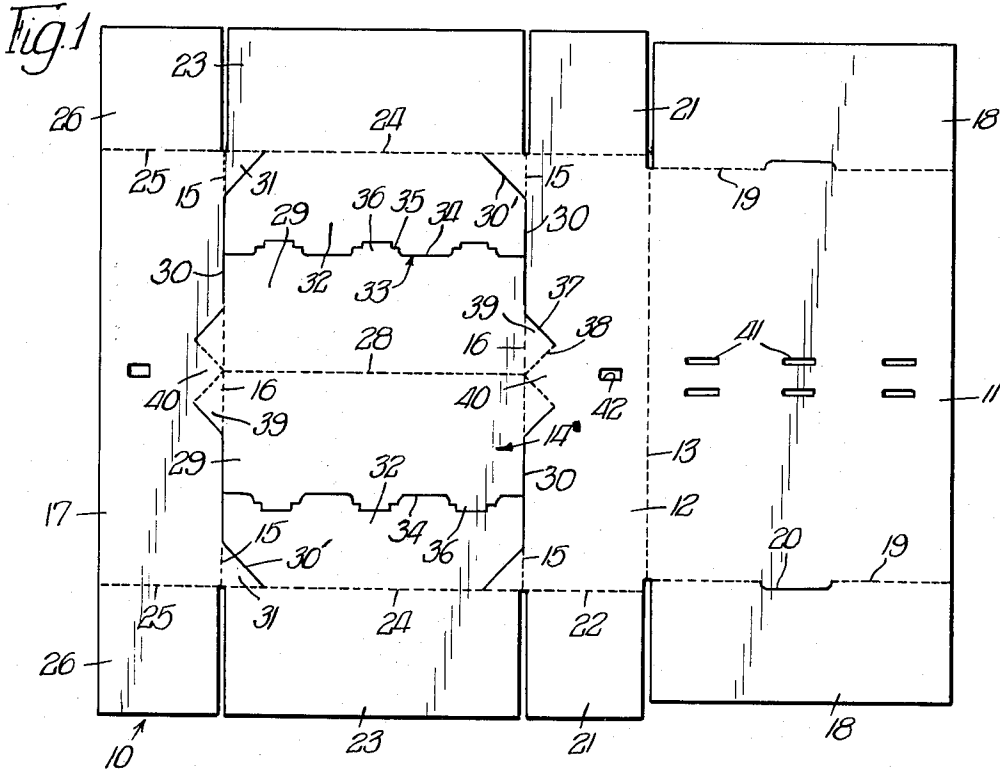
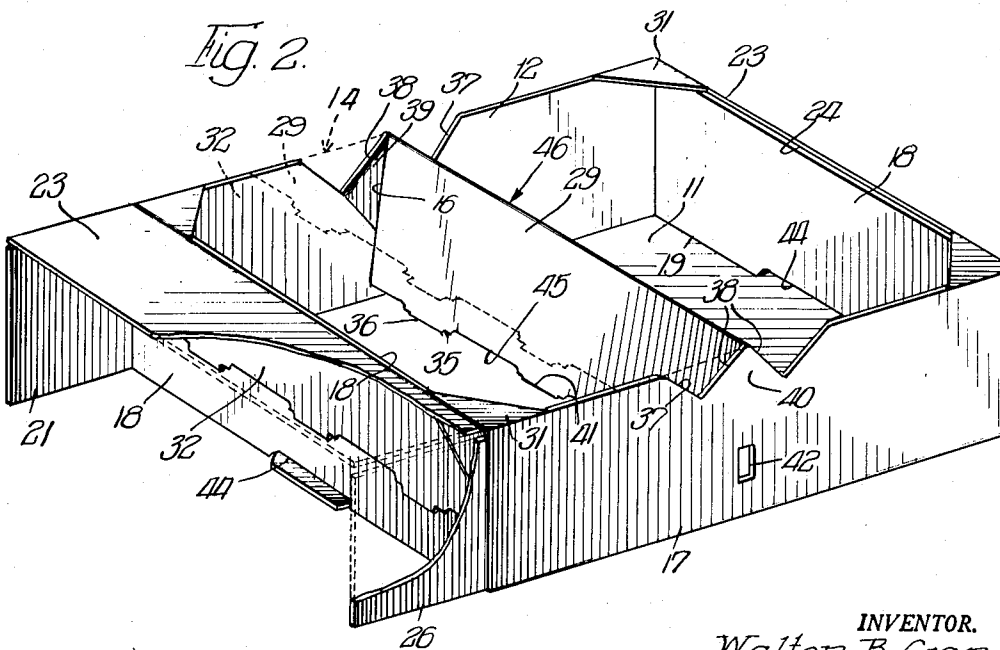
May 8, 1956

W. B. CRANE
SHIPPING CONTAINER

2,744,675

Filed April 23, 1952

2 Sheets-Sheet 1



INVENTOR.
Walton B. Crane,
BY
Cromwell, Grist & Warden
attys

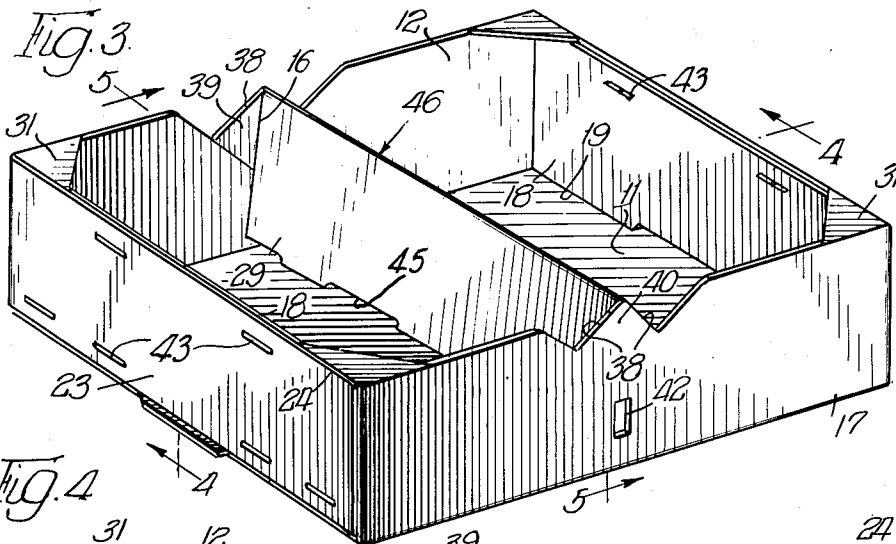
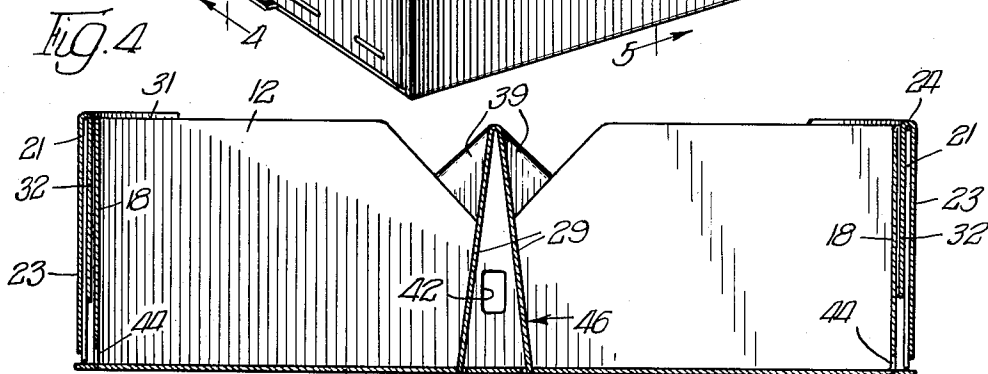
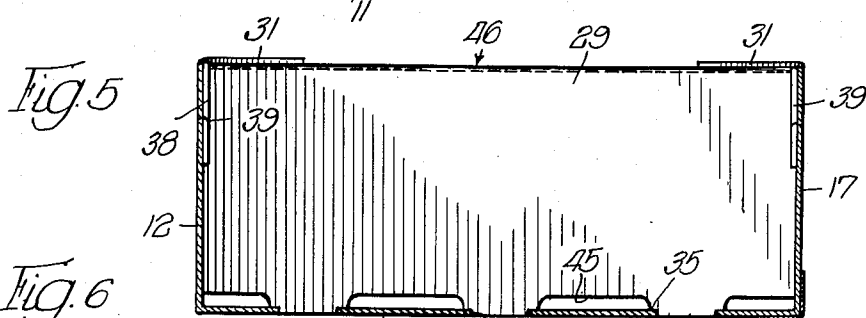
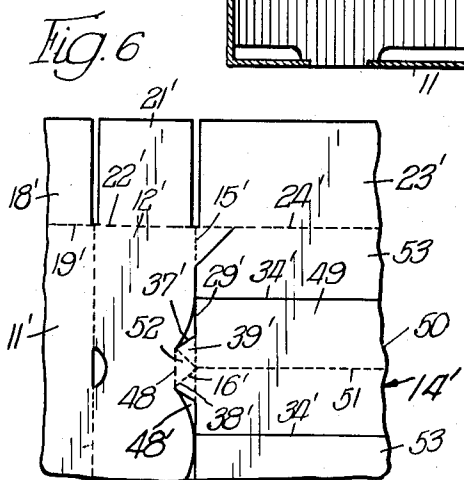
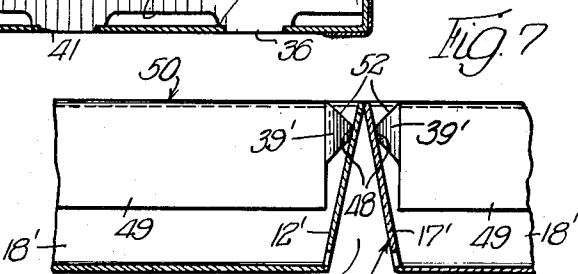
May 8, 1956

W. B. CRANE
SHIPPING CONTAINER

2,744,675

Filed April 23, 1952

2 Sheets-Sheet 2



INVENTOR.
Walter B. Crane,
BY
Cromwell, Trist & Warden
Attys.

1

2,744,675

SHIPPING CONTAINER

Walton B. Crane, Woodland Hills, Calif., assignor to Allied Plastics Company, Los Angeles, Calif., a corporation of California

Application April 23, 1952, Serial No. 283,837

4 Claims. (Cl. 229—27)

The present invention relates to improvements in a tray-type shipping container fabricated from a one-piece blank of a suitable, relatively rigid or reinforced paper-board stock, preferably corrugated board.

The improvements referred to reside in the provision of a greatly strengthened end wall structure for such a shipping container, made up of a number of panels interleaved with one another in a novel manner to afford a very strong, rigid and board-like wall, comparable to a wooden construction in its ability to receive and sustain vertical crushing loads.

Another object of the invention is to provide a compartmented shipping container of the above sort, subdivided into individual cells, compartments or sections by one or more transversely extending, two-walled partitions, these partitions all being cut from a single top panel of a corrugated board tube of rectangular vertical cross section, in erected position, from which the remainder of the container structure is fabricated.

A still further object is to provide an improved compartmented, tray-like container of the kind described in the two preceding paragraphs, in which not only the panels of the aforesaid two-walled partitions, but also a plurality of the panels of each of the aforesaid interleaved type end walls, are derived from the aforesaid single top panel of the aforesaid tube.

Yet another and more specific object of the invention is to provide a container featuring an improved, multiple-ply end wall structure constituted by at least three panels, two of which are integrally hinged to a partition defining panel as described above, being swingable in opposite directions about such hinge into parallelism, the third panel being integrally hinged to a bottom forming member of the carton tube, these end forming panels being interleaved with one another in an improved manner, whereby a smooth, finished interior end wall surface is present when the carton is completely erected.

A still further object is to provide a carton unit fabricated from a flat, one-piece blank of corrugated board or equivalent stock, which container is easily and quickly erected from a flat, knocked-down tubular condition in which it is shipped or stored to an erected condition, presenting upright side walls and bottom and top panels extending between those walls, the top panel being cut and creased to provide partition forming panel members which are bendable downwardly about medial creases and, if desired, interlocked with the bottom so as to afford an upstanding partition or partitions of inverted V-shaped sectional outline, the partition being integrally connected to the side walls by improved bracing gusset formations which contribute substantially to the rigidity of the partition and side wall structure, the top panel being further availed of to provide opposite bendable end wall panels at each end of the container which coat with a bottom-hinged panel and certain side wall-hinged flaps to afford an extremely rugged shipping unit.

The foregoing statements are indicative in a general way of the nature of the invention. Other and more

2

specific objects will be apparent to those skilled in the art upon a full understanding of the construction and operation of the device.

Two embodiments of the invention are presented herein for purpose of illustration. It will be appreciated that the invention may be incorporated in other modified forms coming equally within the scope of the appended claims.

In the drawings;

Fig. 1 is a top plan view of a generally rectangular corrugated board blank employed in fabricating the present container unit;

Fig. 2 is a perspective view, partially broken away, illustrating the container in an intermediate phase of the operation of erecting the same from a flat, knocked-down tubular condition to a fully erected condition, this view indicating in dotted line the position of certain end wall and cross partition forming panels in a preceding phase of the erecting operations;

Fig. 3 is a perspective view illustrating the container unit in fully assembled condition, ready for the reception of its intended contents;

Figs. 4 and 5 are views in transverse vertical cross section and in longitudinal vertical section, respectively, along lines corresponding to line 4—4 and line 5—5 of Fig. 3, more clearly illustrating end and side wall and cross partition details of the unit;

Fig. 6 is a fragmentary view illustrating a portion of a blank employed in fabricating an inclined wall container according to a modification of the principle of the present invention; and

Fig. 7 is a fragmentary view in transverse vertical section, generally similar to Fig. 4, illustrating a pair of the modified containers disposed in immediate side by side relation, thus providing a ventilating passage therebetween.

Referring to Fig. 1 of the drawings, a corrugated paper-board blank 10 is shown died out in a generally rectangular outline. It consists of a series of hingedly articulated panels including, from right to left in the order named, a bottom forming panel 11, a side wall forming panel 12 hinged to panel 11 by a transverse crease 13, a partition and end wall forming section or panel, generally denoted 14, hinged to panel 12 by means of a series of aligned end and intermediate creases 15, 16, and a second side wall forming panel 17 which is hinged to the panel 14 by a similar series of aligned end and intermediate creases, also designated 15, 16, respectively.

A pair of first end wall forming flaps 18 are integrally hinged to bottom panel 11 by means of creases 19 which are medially interrupted by shallow, U-shaped slits 20. These slits define a ventilating opening at the bottom of the end walls of the completed carrier. Rectangular end wall flaps 21 are integrally hinged to opposite ends of panel 12 by creases 22. A pair of second rectangular end wall forming panels 23 are integrally hinged to the ends of panel 14 by a crease 24, and creases 24 integrally hinge end wall flaps 26, similar to flaps 21, to the side wall panels 17.

Partition and end wall forming panel or section 14 is provided with a central, longitudinally extending crease 28 which hingedly articulates a pair of like partition forming panels 29 to one another, each of generally rectangular outline. This crease intersects the mid-point of the two intermediate creases 16 at opposite sides of panel 14. Parallel slits 30 extend in opposite direction from the termini of creases 16 and are provided with 45°, mutually inturned outer extremities 30'. These extremities terminate at the respective end wall creases 24, thus defining triangular webs 31 at the four corners of the panel 14. The other two sides of the webs 31 are defined by the creases 15, 24, respectively. The slitting of the blank at 29, 30 thus frees a pair of third end wall

forming panels 32 from side wall panels 12, 17, for swinging about the respective end hinges 24. Panels 32 are separated from partition panels 29 by means of specially shaped slits 33 which comprise aligned straight portions 34 separated by stepped shouldered portions 35. The shouldered portions outline locking lugs or feet 36 at three points along the length of slit 33. Slits 34 terminate at the side slits 30.

The inner ends of slits 30 are provided with outwardly divergent, 45° angled portions 37, whose termini are connected by 45° creases 38 with the junction point of the intermediate side creases 16 and the central creases 28. Creases 16, 28 thus define triangular gussets 39 connecting partition panels 29 with the side walls 12, 17 at triangular areas 40 of the latter which, in the erected condition of the container, are located at the upper margin of the walls.

Bottom forming panel 11 is provided with two series of elongated, longitudinally aligned slots 41 which are adapted to receive the locking feet or lugs 36 on the partition forming sections 29, when the container unit is completed and erected, the shoulders 35 of the lugs then abutting panel 11. Side wall panels 12, 17 are each provided with a central ventilating opening 42.

It has not been deemed necessary to illustrate the container unit in its completed, flat, tubular, knocked-down condition. This condition is assumed when the bottom and side wall forming panels 11, 17 are folded upwardly, inwardly and downwardly about the respective side marginal creases 13 and series of creases 15, 16, the thus folded panels being then secured to one another in edge abutting relation, as by a suitable tape.

Although I have illustrated a unit having a bottom forming panel 11 of full transverse width, it is to be understood that this is not an essential feature of the invention. If desired, the bottom may also be conventionally formed of two similar panels hinged to the respective side walls 12, 17 in an obvious manner, with end wall forming flaps equivalent in function to the flaps 18 hinged to the opposite extremities of such composite bottom forming structure.

In erecting the container unit from its flat, tubular condition, the same is spread to a rectangular sectional outline by exerting compressive force on the opposite side margins of the collapsed tube or envelope, represented by the crease 13 and the series of creases 15, 16. The container unit may be temporarily locked in this expanded condition by swinging the partition forming panels 29 downwardly about medial crease 28, the gussets 39 buckling downwardly about creases 16, 38 to a side by side relation to walls 12, 17 at this is done. Locking feet lugs 36 are snapped into the slots 41 of bottom panel 11, with their shoulders 35 in direct edge engagement with the last named panel. This holds the tube in rectangular condition, freeing the hands of the operator for the ensuing manipulations in completing the end walls of the container, as follows:

The first end wall forming flaps 18, hinged to bottom panel 11, are first folded upwardly well beyond vertical position, i. e., sufficiently inwardly of the container interior to enable the end wall forming panels 32 of member 14 to be swung downwardly and outwardly about their creases 24 from the dotted to the solid line position shown in Fig. 2, which operation is next performed. The parts are then released, leaving the panels 32, 18 urged in side by side contact with one another under their inherent spring, with the former disposed outwardly of the latter, as illustrated in solid line in Fig. 2 of the drawings. End wall flaps 21, 26 are then folded inwardly about creases 22, 25, respectively, and disposed in outward side by side relation to flaps 32.

As a final folding operation, the remaining end wall forming panels 23 are swung downwardly about creases 24 to a vertical position in face contact with the flaps, as illustrated in Fig. 3, in which position the flaps and

panels 23 are secured together, as by staples or stitches 43. The presence of the end wall flaps 21, 26 between inner and outer end wall forming panels 18, 23 provides space for the convenient insertion of the anvil of a stapling mechanism. Likewise, panels 32 and flaps 21, 26 space the outer end wall panel 23 substantially from the inner panel 18 in the central zone of the end wall, i. e., adjacent a ventilating opening 44 defined by the slit 20 (Fig. 4). This affords a desired circulating space for freer flow of air into or out of the opening. The container is completed by applying further stitches 43 or staples adjacent the top of the end walls, these stitches extending through all of the component parts of the end walls and locking the inner panels 18 in upright position.

The rigid, multi-ply end structure constituted by interleaving the end wall panels and flaps as described above, coupled with the action of the triangular webs 31 of locking the end walls to the side walls at the container corners and the side bracing action of the two-walled partition 46 constituted by panels 29, contributes great rigidity and column strength to the container as a whole. It is capable of sustaining a heavy load represented by similar filled containers resting in a stack thereon. In this respect it approximates the strength of a wooden container. The partition 46 (and there may be several, if desired) of course sustains its share of the load also, in addition to bracing the side walls through its gusset connections to the latter. Panels 18 present smooth inner end surfaces.

Effective ventilating of the container interior is made possible through openings 45 in the bottom of partition 46, the shoulders 35 on locking lugs 36 insuring that the lower edges of panels 29 are elevated above bottom 11 in these zones. (See Fig. 5.) The inverted V-outline of the partition not only adds stability to the latter, it also affords a ventilating passageway through which air is conducted between ventilating openings 45 and the side wall openings 42, which are aligned with the erected partition.

The container is very attractive in appearance and may be produced readily in styles embodying more than one partition by a simple extension of the principle of the invention.

A modified embodiment of the invention is illustrated in Figs. 6 and 7 of the drawings. Parts of the blank for making the same which correspond to parts shown in Fig. 1 of the drawings will be indicated by similar reference numerals, primed. It is the main objective of the modification shown in Figs. 6 and 7 to provide a container unit whose side walls 12', 17' are upwardly and outwardly inclined to some extent. This results in the provision of a ventilating passage S (Fig. 7) between a pair of the containers arranged in immediate side by side relationship. To this end, short creases 48 are formed in the side wall panels 12', 17', connecting the extremities of the respective pairs of angled slit extensions 37' of each partition panel 49 constituting part of a partition 50. Incidentally, the embodiment of Figs. 6 and 7 incorporates a plurality of partitions 50 formed from the panel 14', so that they are necessarily of less vertical depth than the panels 29 of the first form. Triangular areas of the stock are also died out at 48' for increased flexibility of gussets 39' about hinges 38'.

When these provisions are made it is found that an unusual effect results as the panels 49 are swung downwardly about their medial crease 51, in setting up the modified container unit. The extra triangular webs 52 outlined by the creases 38' and 48 bend inwardly about the crease 48, while an outward thrust is exerted through the gussets 39' and these webs on the walls 12', 17', causing the same to assume the outwardly inclined appearance illustrated in Fig. 7 of the drawings.

This is no doubt better described as the result of a local outward bowing of the tops of walls 12', 17', in the

5

zones of the several partitions 50, since the respective shapes and areas of the bottom panel 11' and partition and end wall forming panel 14' are the same. In any event the scalloped contour of the walls has the effect of a general upward inclination in making possible the ventilating passage S between containers disposed side by side, as in Fig. 7.

I claim:

1. A tray-like paperboard container which is fabricated from a one-piece paperboard blank, the blank being cut and creased to provide a series of integrally connected panels which form when the container is erected, a bottom wall, side walls hinged to the side edges of the bottom wall and end walls extending between opposite ends of the side walls, said end walls each comprising a pair of inner and outer end wall forming panels which are hinged to one another on a transverse crease at the top edge of the end of the container, one of said end wall forming panels being connected to the side wall forming panels by corner webs which are hinged thereto on longitudinal and transverse creases, respectively, and an end wall forming flap hinged to the end of the bottom wall forming panel and disposed in upturned relation to said bottom forming panel, said inner and outer end wall forming panels being folded downwardly about the crease hinging the same to one another with said inner panel disposed between and paralleled by said outer panel and flap whereby said flap constitutes an inner part of the end wall and faces the interior of the container and said end wall forming panels and flap being secured in rigid relation to each other.

2. A tray-like paperboard container which is fabricated from a one-piece paperboard blank, the blank being cut and creased to provide a series of integrally connected panels which form when the container is erected, a bottom wall, side walls hinged to the side edges of the bottom wall and in upright relation thereto and upright end walls extending between opposite ends of the upright side walls, said end walls each comprising a pair of inner and outer end wall forming panels which are hinged to one another on a transverse crease at the top edge of the end of the container, the outer one of said end wall forming panels being connected to the side wall forming panels by corner webs which are hinged thereto on longitudinal and transverse creases, respectively, at the top edges of the container and an end wall forming flap hinged to the end of the bottom wall forming panel and disposed in upturned relation to said bottom forming panel, said end wall forming flap being substantially the full depth of the end wall, said inner and outer end wall forming panels being folded downwardly about the crease hinging the same to one another and into engagement with each other, said inner panel being disposed between said outer panel and flap and said panels and flap being secured to each other whereby said flap constitutes an inner part of the end wall and faces the interior of the container.

3. A tray-like paperboard container which is fabricated from a one-piece paperboard blank, the blank being cut and creased to provide a series of integrally connected panels which form when the container is erected, a bottom wall, side walls hinged to the side edges of the bottom wall and in upright relation thereto and upright end walls extending between opposite ends of the upright side walls, said end walls each comprising a pair of inner and outer end wall forming panels which are hinged to one another on a transverse crease at the top edge of the end of the container, one of said end wall

6

forming panels being connected to the side wall forming panels by top corner webs which are hinged thereto on longitudinal and transverse creases, respectively, at the top edges of the container, an end wall forming flap hinged to the end of the bottom wall forming panel and disposed in upturned relation to said bottom forming panel, said end wall forming flap being substantially the full depth of the end wall, said inner and outer end wall forming panels being folded downwardly about the crease hinging the same to one another with said inner panel disposed between and paralleled by said outer panel and flap, and end flaps integrally hinged to the side wall forming panels and interleaved between said hingedly connected inner and outer end wall forming panels, and said end wall forming panels and flaps being secured in rigid relation to each other.

4. A tray-like paperboard container which is fabricated from a one-piece paperboard blank, the blank being cut and creased to provide a series of integrally connected panels which form when the container is erected, a bottom wall, side walls hinged to the side edges of the bottom wall, end walls extending between opposite ends of the side walls, and a transverse partition intermediate the ends of the side walls, said end walls each comprising a pair of inner and outer end wall forming panels which are hinged to one another on a transverse crease adjacent the end of the container, one of said end wall forming panels being connected to the side wall forming panels by corner webs which are hinged thereto on longitudinal and transverse creases, respectively, and an end wall forming flap hinged to the end of the bottom wall forming panel and disposed in upturned relation to said bottom forming panel, said inner and outer end wall forming panels being folded downwardly about the crease hinging the same to one another with said inner panel disposed between and paralleled by said outer panel and flap, and said inner and outer panel and flap being secured in rigid relation to each other whereby said flap constitutes an inner part of the end wall and faces the interior of the container and said transverse partition comprising a pair of panels integrally hinged to one another by a transverse crease extending between and at a right angle to said side wall forming panels, said cross partition panels being hinged to the side wall forming panels by triangular gussets formed in the last named panels and said pair of partition forming panels being folded inwardly about their connecting transverse crease and having their edges secured in longitudinal spaced relation to the said bottom forming panel thereby to form a rigid partition of inverted V-shape.

References Cited in the file of this patent

UNITED STATES PATENTS

688,421	Keys	Dec. 10, 1901
1,211,223	Pinkerton	Jan. 2, 1917
2,132,957	Mahone	Oct. 11, 1938
2,303,264	Flick	Nov. 24, 1942
2,354,098	Bamber	July 18, 1944
2,389,703	Van Rosen	Nov. 27, 1945
2,435,135	Franck	Jan. 27, 1948
2,549,682	Grossniklaus	Apr. 17, 1951
2,578,775	Belsinger	Dec. 18, 1951
2,579,760	Saidel	Dec. 25, 1951
2,605,035	Williamson	July 29, 1952

FOREIGN PATENTS

649,414	Great Britain	Jan. 24, 1951
---------	---------------	---------------