June 22, 1965 J. H. NUTE 3,190,535

SELF-LOCKING CONTAINER

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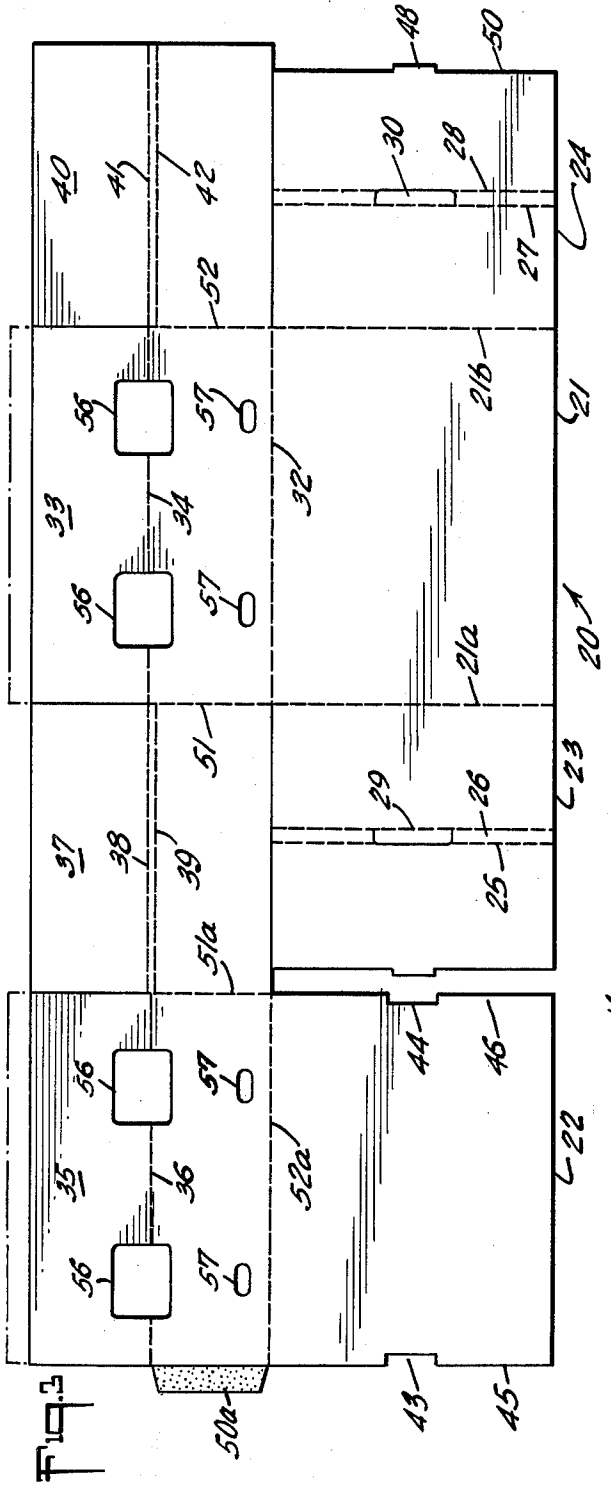


FIG. 3

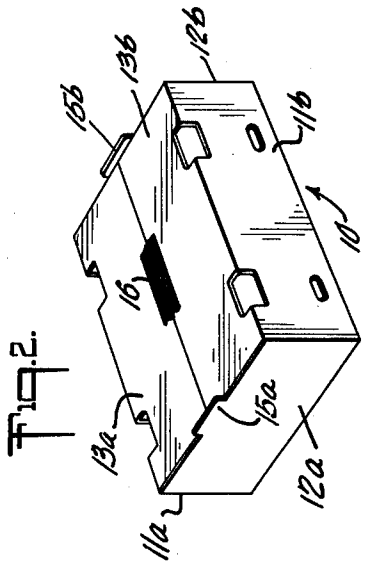


FIG. 2.

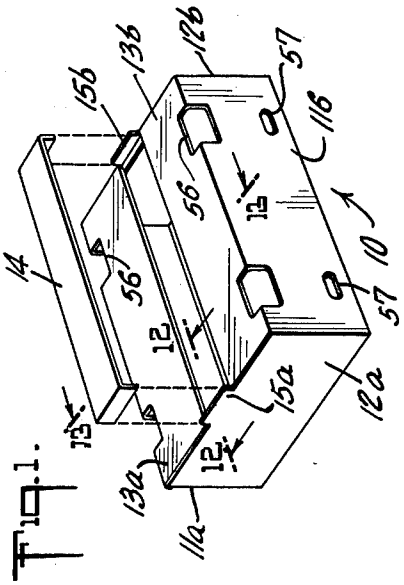


FIG. 1.

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Fig. 4.

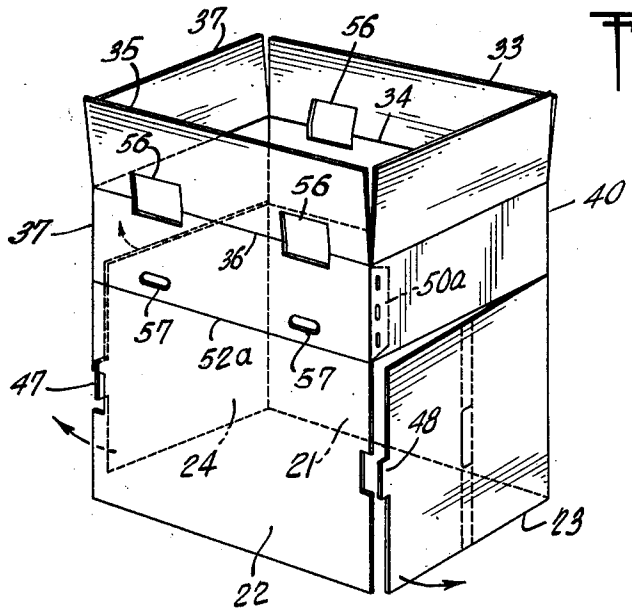
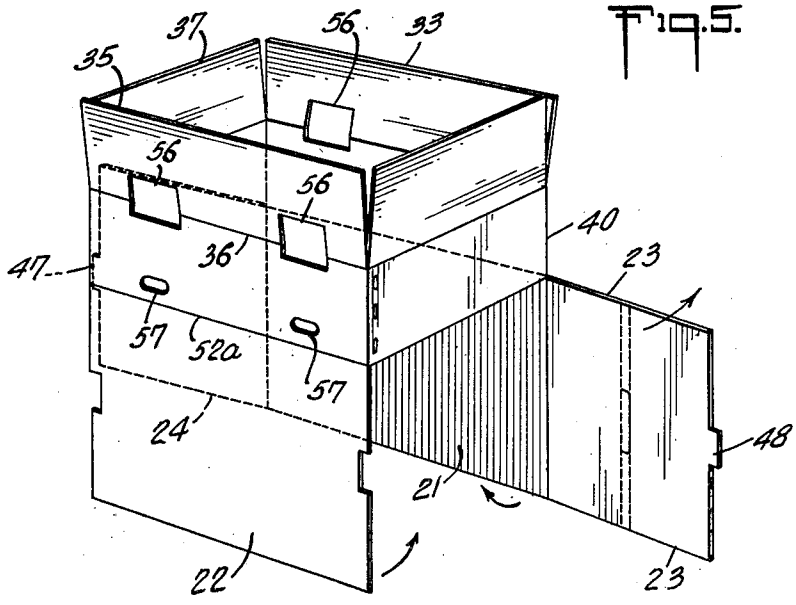


Fig. 5.



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FIG. 6.

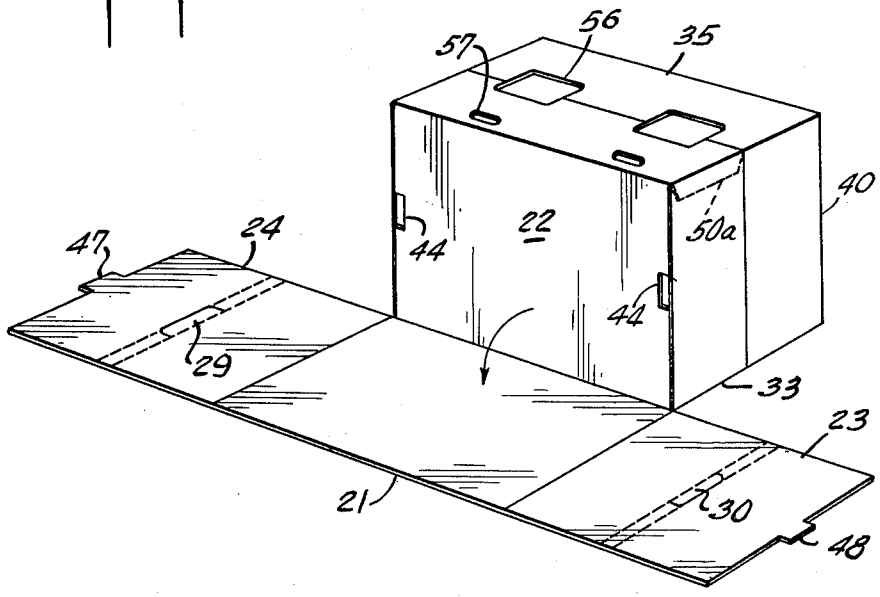
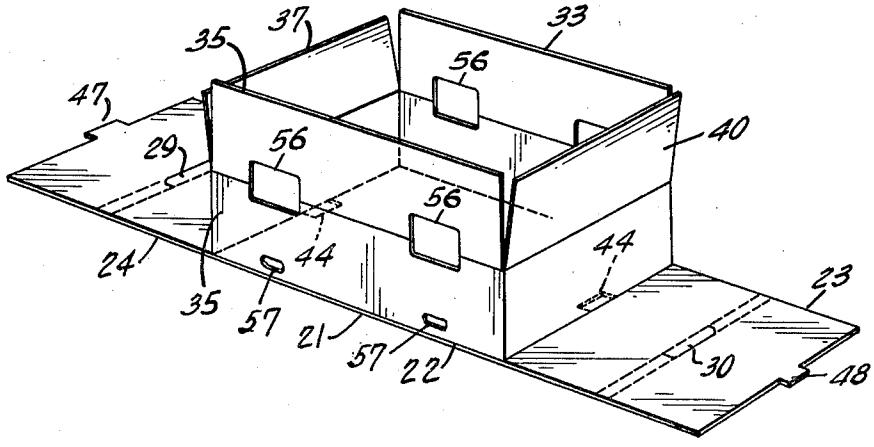


FIG. 7.



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Fig. 8.

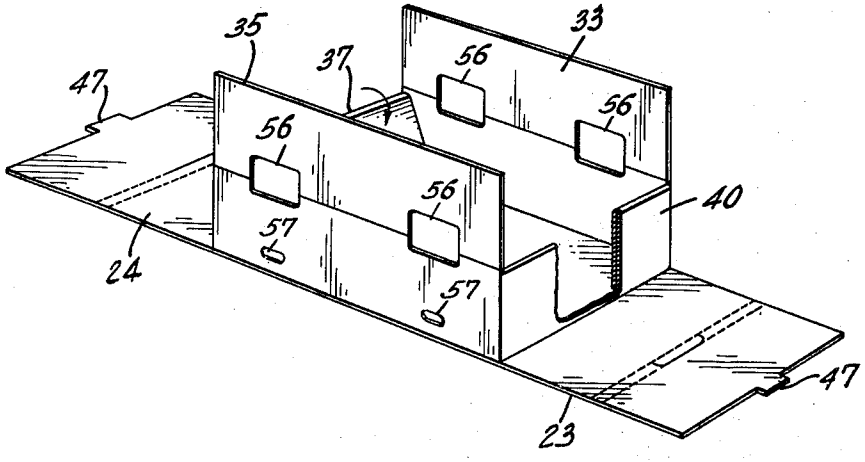
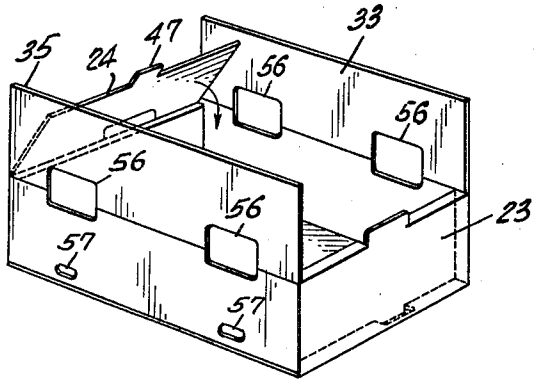


Fig. 9.



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Fig. 10.

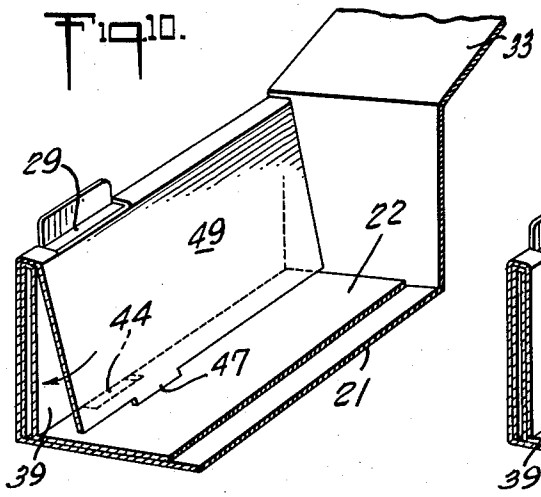


Fig. 11.

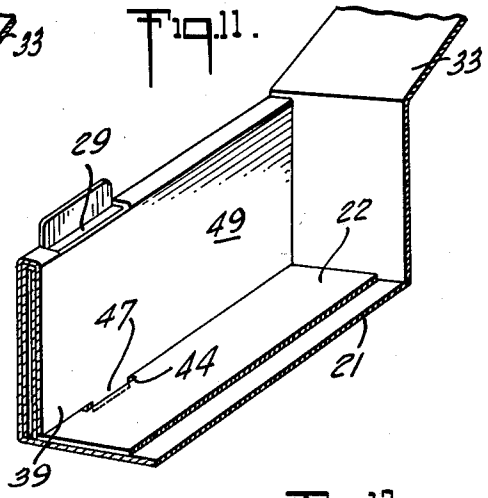


Fig. 12.

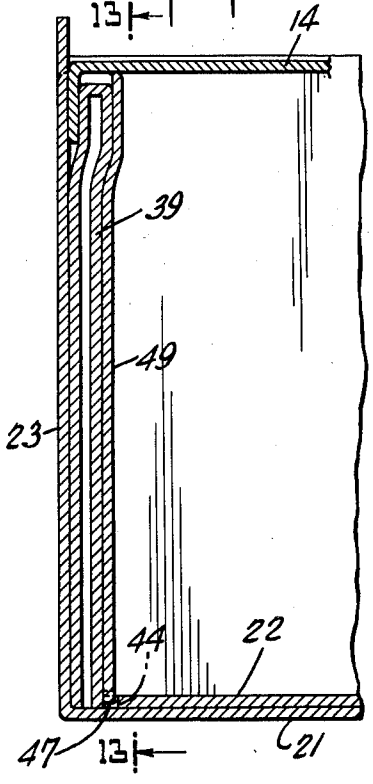
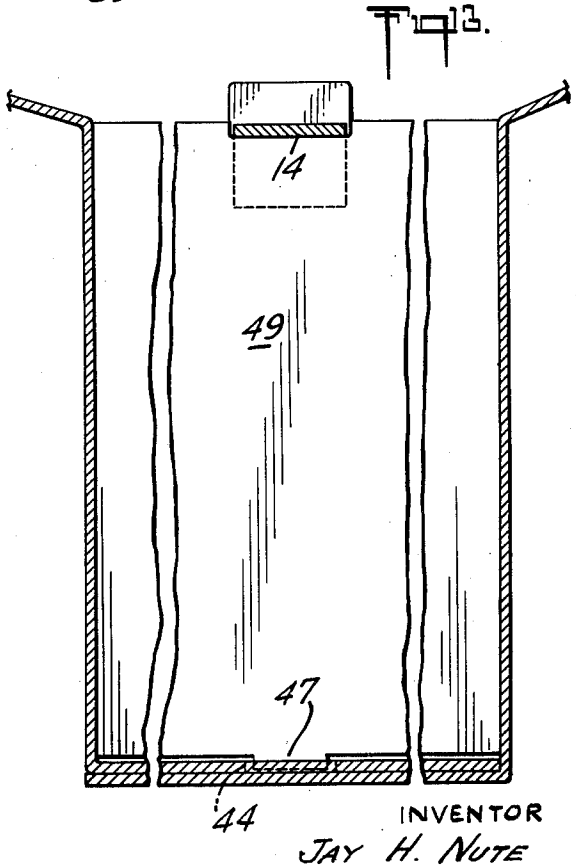


Fig. 13.



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United States Patent Office 3,190,535 Patented June 22, 1965

3,190,535

SELF-LOCKING CONTAINER

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Filed Apr. 19, 1962, Ser. No. 188,822
2 Claims. (Cl. 229—37)

This invention relates to containers, and particularly to containers made of paperboard or similar materials for holding and transporting fruits, vegetables, and other articles packed in bulk.

A principal object of the invention is to provide a container for handling heavy produce such as tomatoes, potatoes, apples or the like, wherein the bottom and certain of the vertical walls are reinforced for stacking strength and wherein cover members are provided which include locking portions particularly designed for efficient interlocking with the reinforced vertical walls.

Another object of the invention is to provide a single cut and scored sheet capable of being erected into a container having multi-ply wall construction, wherein the arrangement and relation of panels affords an interlocking of parts without resort to additional or separate securing means.

A still further object of the invention is to provide a self-locking container which is simple in construction, efficient, economical, readily and quickly assembled at low cost.

Further objects, features and advantages of the invention will readily become apparent to one skilled in the art from a reading of the description and with reference to the accompanying drawings in which:

FIG. 1 is a perspective view of a container made in accordance with the teachings of the present invention;

FIG. 2 is a perspective view of a container modified from FIG. 1 according to another embodiment of the invention;

FIG. 3 is a plan view of a single flat blank from which the container is made;

FIG. 4 is a perspective view of the blank showing certain portions thereof squared up and folded in the first stages of the container formation;

FIG. 5 is a perspective view similar to FIG. 4 showing additional portions of the blank folded in a more advanced stage of the container formation;

FIG. 6 is a perspective view similar to FIG. 5 showing yet further folding of the blank portions in a still more advanced stage of the container formation;

FIG. 7 is a perspective view similar to FIG. 6 showing still yet further folding of the blank portions in a yet still more advanced stage of the container formation;

FIG. 8 is a perspective view similar to FIG. 7 showing still yet further folding of the blank portions in a yet still more advanced stage of container formation with a partial end section exposure;

FIG. 9 shows in perspective substantially assembled the container just prior to locking and securing the end flaps into the bottom of the container;

FIG. 10 shows an end section of FIG. 9 with the end flap just prior to being locked to the bottom of the container;

FIG. 11 is similar to FIG. 10 with the end flap completely locked in;

FIG. 12 is a sectional view through the line 12—12 of FIG. 1;

FIG. 13 is a sectional view through the line 13—13 of FIG. 1.

Referring to the drawings and particularly to FIG. 1 which shows an assembled container according to one embodiment of the invention. The bottom of the assembled

container, indicated as a whole at 10, has joined therewith side panels 11*a* and 11*b* and end walls indicated as a whole at 12*a* and 12*b*. The side panels 11*a* and 11*b* carry cover flaps 13*a* and 13*b* respectively, hinged on their upper edges. As herein shown, the container is of the top opening, double cover style particularly desirable for use in packaging bulk produce. While the container may be formed from various types of paper board or other sheet material, it is preferably formed from strong and relatively stiff but readily foldable resilient corrugated paperboard. Further, the cover flaps 13*a* and 13*b* may have their extremities foreshortened so that on closure they fail to meet but are completely locked and sealed in by an elongated locking strip 14 disposed to have its extremities folded over so as to engage a pair of locking apertures 15*a* and 15*b* formed at the upper central portion of the end walls when the container is completely formed. In the alternative, the cover flaps may be extended so as to have their extremities meet, as shown in FIG. 2, a modified version of the container shown in FIG. 1. Here the covers may be held in locked position by any suitable adhesive member 16 such as tape and the like.

Now referring to FIG. 3 there is shown therein a unitary blank 20, generally rectangularly shaped, from which the container is formed. The blank is cut and appropriately scored to provide a main or bottom outer panel 21 and a scored main or bottom inner panel 22. There is hingedly attached along scorelines 21*a* and 21*b* to the bottom outer panel 21, along the outer edges thereof, a pair of outer end panels 23 and 24 each of which has centrally located dual parallel spaced scorelines 25, 26 and 27, 28 respectively and a pair of centrally disposed elongated apertures 29 and 30 running in the scoreline direction for receiving the locking strip 14 shown in FIG. 1. The scorelines throughout the various figures are shown dotted to represent those locations in which folding of the particular parts of the blank is to take place. There is also hingedly attached along an outer edge 32 of the main bottom outer panel 21 a side panel 33 having a scoreline 34 along the central portion thereof. In a similar manner, there is hingedly attached along an outer edge 52*a* of the main bottom outer panel 22 a side panel 35 having scoreline 36 centrally located similar the scoreline 34 on panel 33. Side panels 33 and 35 have attached thereto between them and along one of their respective outer edges, an inner end panel 37 which has a pair of spaced apart scorelines 38 and 39 centrally located. Side panel 33 has also along its other and opposing outer edge an inner end panel 40 which likewise has a pair of spaced apart scorelines 41 and 42 similar to scorelines 38 and 39 on panel 37. There is further shown on the main bottom inner panel 22, a pair of cut-outs or notches 43, 44 located along opposing edges 45 and 46 of the said panel for receiving a pair of tabs 47 and 48 located along edges 49 and 50 respectively of outer end panels 23 and 24 and is extensive therewith. There is a cooperation of both the notches and tabs for the purpose of locking the end panels to the bottom of the container when the container is finally assembled. Now referring to FIGS. 4 through 9 the blank 20 is shown in progressive stages of forming a container 10 and a preferred sequence of folding or manipulation of the bottom side and end panels will now be described with reference thereto.

In FIG. 4 the blank 20 is first squared up and held in an upright position by causing gummed tab 50*a* to adhere to an outer edge of inner end panel 40. Squaring up first in this position permits all the respective parts or components of the blank to become bent or folded to facilitate assembly of the completed carton. Subsequent to squaring up, the outer end panels 23 and 24 are folded outwardly away from the upright position as shown in

FIG. 5 so as to permit the bottom inner panel 22 to be folded upward along score line 52*a* into the squared portion formed by upright panels 33, 34, 35 and 36. Subsequently the squared partially formed upright carton consisting of bottom panel 22 and sides and end panels 33 through 36 is folded over score line 32 as shown in FIGS. 6 and 7 so as to cause the inner bottom panel 22 to become seated and in complete registry with the bottom outer panel 21. There is further provided a series of holes 56 and smaller apertures 57 in the container to assure proper ventilation and air circulation.

FIGS. 8 and 9 further show the progression of the formation of the box and particularly show the inner end panels 37 and 40 folded inwardly along their centrally located scorelines 38–39 and 41–42 so as to form a pair of two-ply inner end walls when the end walls are completely folded over and closed. After closure of the inner end panels, the outer end panels 23 and 24 are each similarly folded along their respective score lines 25–26 and 27–28 and also made to overlay the closed inner end walls 37 and 40 and to become contiguous therewith to form a continuous 4-ply end wall construction. Upon overlay of the outer end wall, closure is made by permitting the extending tabs on the outer end walls to engage and cooperate with notches 43 and 44 in the main bottom inner panel to form a locking position to complete the end wall construction.

FIGS. 10 and 11 are partially sectioned end portions of the box just prior and subsequent to the locking of the outer end panels with the inner bottom, and particularly with respect to the tab 47 and its cooperation with the notch 43. FIG. 11 is the same as FIG. 10 with the end panel completely formed and finally locked in. There is further shown in FIGS. 10 and 11 an aperture 29, having its counterpart in the opposing end panel not shown in the figure, for receiving a locking bar member 14 as previously discussed with respect to FIG. 1. In particular, FIG. 11 shows a cross-section through the end panel with the locking bar 14 locked in place. It may be seen here that a portion of the end panel is partially displaced inwardly to provide essentially a pressure type contact with the locking bar so as to maintain it fixedly in place.

It is apparent from the foregoing description and with reference to the accompanying drawings, that the present invention provides a container formed from a single sheet of material, such as paperboard, having multi-wall construction and being rapidly interlocked in assembly without resort to additional or separate securing means. The novel locking means embodied in the construction affords an integral container which is very strong and capable of accommodating heavy loads, and which provides end walls having great stacking strength.

While the foregoing specification sets forth the invention in specific terms, and in reference to one embodiment, it is to be understood that many variations and modifications may be resorted to without departing from the broad aspects of the invention as defined by the following claims.

Having described the invention, what is claimed is:

1. A container of paperboard or like material comprising a bottom wall, a pair of oppositely disposed side walls, the first side wall being hinged to an edge of said bottom wall, a pair of oppositely disposed four-ply end walls formed from a first set of end panels hinged to opposed edges of said bottom wall and from a second set of end panels hinged to opposed edges of said one side wall, said end panels being folded into superposed relation about a centrally disposed fold line parallel to and spaced from the end edge of said bottom wall, and the second side wall being hinged to one end of one of the end panels in the second set.

2. A container according to claim 1 wherein said bottom wall includes two panels, one being hinged to the lower edge of said one side wall and the other being hinged to the lower edge of the other side wall, said bottom panels being generally rectangular and coextensive in dimension.

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