

April 7, 1964

W. T. COOK
SHIPPING CONTAINER

3,128,033

Filed Feb. 19, 1962

2 Sheets-Sheet 1

FIG. 1

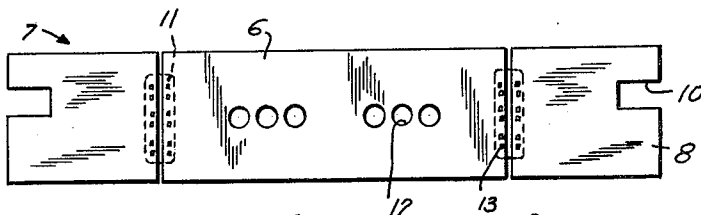


FIG. 2

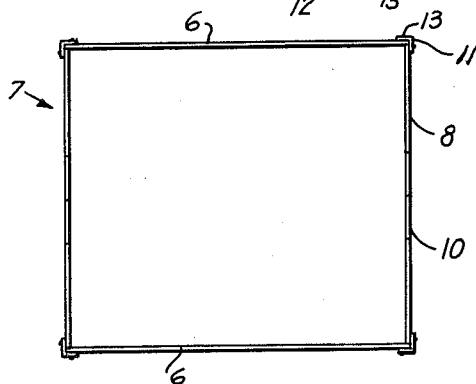
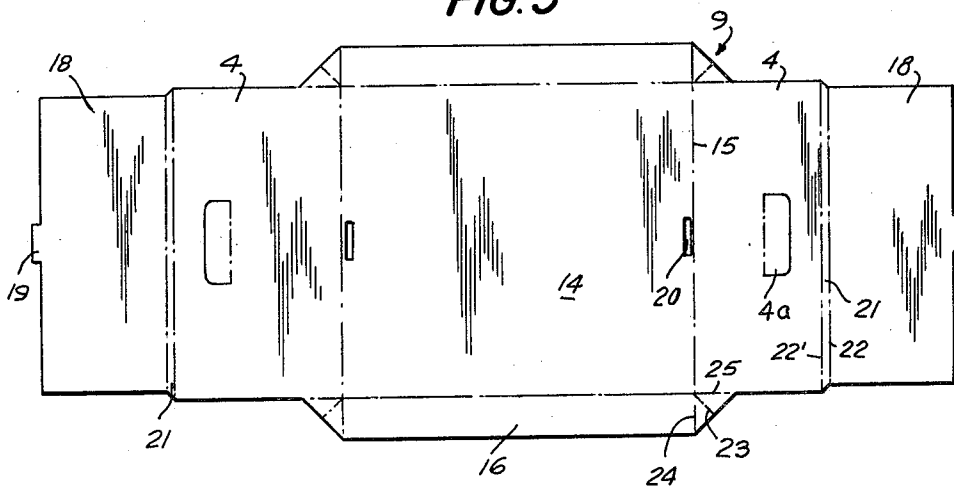


FIG. 3



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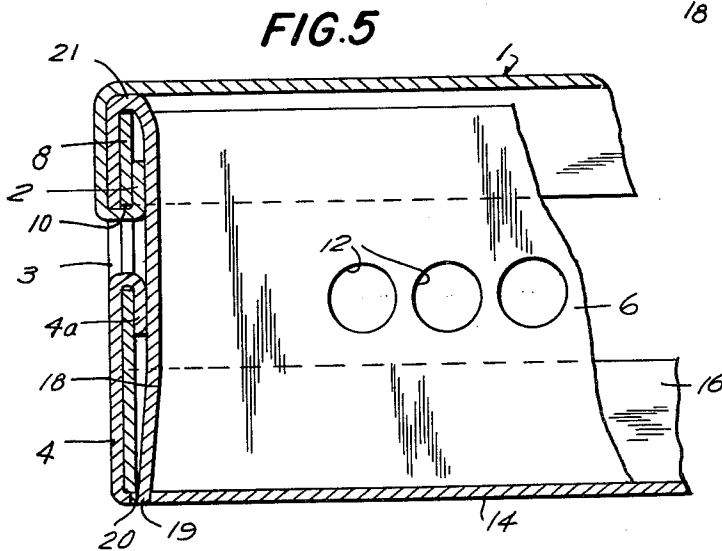
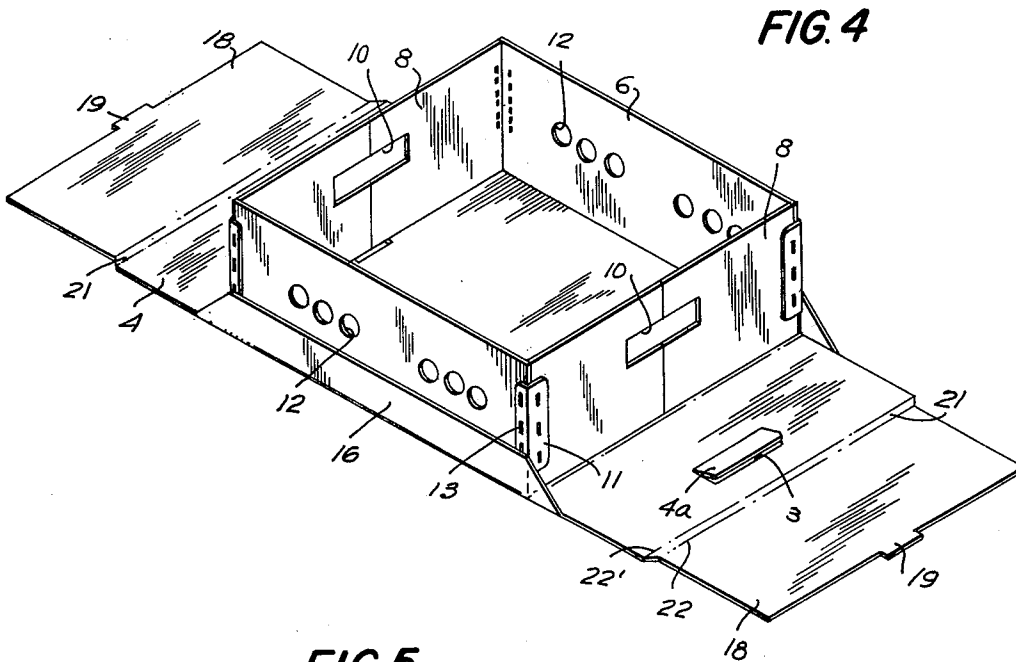
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2 Sheets-Sheet 2



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SHIPPING CONTAINER
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The present invention relates to shipping containers, and more particularly to the so-called knock-down type of containers which may be readily shipped in flat shape and then readily assembled by hand from their component parts without the use of any tools.

The shipping container of this invention is particularly useful in the transportation and storage of perishable goods, such as fruit and vegetables, which have rigid requirements in respect of refrigeration, humidity and stacking conditions, for instance. Thus, the shipping containers are particularly adapted to serve as receptacles for the shipping and storage of tomatoes, grapes, peaches, pears, apples, avocados and such other soft fruits which are readily bruised and perishable, wherefore they must be packed, stored and shipped under ideal conditions, such as high humidity and with plenty of ventilation.

When such containers are made of corrugated cardboard, they are not of sufficient strength to withstand the load exerted on the bottom containers when they are stacked in tiers. If wood is used, they are sufficient strength but the cost of the container, high freight cost due to increased weight as well as the increased handling cost all go to make this type of container prohibitive to use. With this in mind, the instant invention was conceived to provide a combination shipping container made up of composition board and corrugated cardboard which possesses the attributes needed in such a container and avoiding the disadvantages of the prior art. One of the main problems in the design of such a shipping container is to be able to keep the weight down to a bare minimum and still keep the rigidity and strength up in order to meet all the requirements made upon such a container.

It is accordingly the primary object of the present invention to provide a receptacle of unusual strength and rigidity for a shipping container for perishables, which can be readily assembled by hand without the use of tools from prefabricated units which may be shipped and stored in flat form.

It is another object of the present invention to provide a lid for the receptacle, which is fitted tightly down over the outside edges of the receptacle and is securely fastened thereto at each end to provide a smooth gripping opening for subsequent handling in loading, storing, unloading and inspection.

These and other objects and advantages are accomplished in accordance with the disclosures made herein by constructing the receptacle of the container of three separate units, two of which are alike and readily interchangeable. On assembly, three units lock together to form the complete receptacle of the container. The two similar units may be used interchangeably to form the frame portion of the receptacle. Each of these units consists of a flat rigid side board forming the side of the box and two rigid end boards folded inwardly and connected at each end of the flat rigid side board and forming right angles therewith. The flat rigid side boards form parallel side walls of the frame portion and each two of the abutting end boards form parallel end walls of the frame portion. The inwardly folded rigid end boards have elongated cut-outs so formed in each end as to form a slotted opening in the assembled frame portion to provide a handling and locking slot. The connecting means used for fastening the two rigid boards to the side board are flexible and so arranged as to fold the end boards inside the side boards in order to secure maximum strength and rigidity. The third receptacle unit is an

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integral, scored and cut-to-size corrugated cardboard member comprising a central rectangular bottom portion, two upwardly extending flap portions extending laterally of the central rectangular bottom portion and arranged to be locked in upwardly extended position against the side walls of the frame portion, two end walls extending beyond the central rectangular bottom portion arranged to form a right angle therewith and thus form the outside retaining member for the flat rigid end boards and thus form the outer end walls of the receptacle portion, two extensions extending downwardly over the inside faces of the flat rigid end boards and arranged to be substantially parallel thereto, and webs of appropriate thickness for spanning the rigid end boards integrally connecting the outer end walls and the extensions. The inwardly extending rigid end boards of the frame portion are securely locked in place and held between the parallel outer end walls and the extensions of the central rectangular bottom member. Elongated cut-outs are provided in the two parallel end walls in registry with the cut-outs in the two flat rigid end boards. The downwardly extending extensions are provided with locking tabs which securely lock the extensions in place in slots in the central rectangular member thereby to hold the two inwardly extending flat rigid end boards in place therebetween and in snug engagement and thereby prevent the movement of the flat rigid side boards attached thereto.

According to one feature of the invention, the frame portion rigid side boards and rigid end boards are attached together by means of a plurality of flexible metal strips in such a way as to allow the flexible metal strip to form over the end of the rigid side board and allow the rigid end boards to be held against and at right angles to the side board with its outside face flush with the end of the side boards.

The elongated cut-out portion of the two upwardly extending end walls of the corrugated cardboard member are in addition used to further lock the rigid end boards in place by being tucked neatly into and downwardly over said rigid end boards.

The receptacle of the shipping container is covered by a lid member of corrugated cardboard provided with side flaps extending downwardly over the flat rigid side boards.

The side flaps are locked in place by means of inwardly folded tucks formed as the end flaps are folded downwardly into place and in addition the end flaps are provided with locking extensions for holding the cover in place by means of tucking an extension of the cover into the cutouts contained in the two parallel end walls and the cut-outs contained in the two flat rigid end boards. In addition to forming a locking means for retaining the cover on the box, these two extensions form a smooth surface of the elongated opening thereby allowing a smooth surface for the hand to grasp the box in handling.

The above and other advantages, objects and features of the present invention will become more apparent from the following detailed description of one preferred embodiment thereof, taken in conjunction with the accompanying drawing wherein

FIG. 1 is a plan view of one of the two like units forming the frame, in flattened condition;

FIG. 2 is a top view of the two like units assembled into the frame;

FIG. 3 is a plan view of the bottom corrugated paperboard member showing the score lines for folding;

FIG. 4 is a perspective view showing the assembly of the receptacle units with the end flaps of the bottom corrugated paperboard member still unfolded; and

FIG. 5 is a fragmentary vertical section of the assembled container including the receptacle and lid.

Referring now to the drawing and first to FIGS. 4 and

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5, there is shown a shipping container having a receptacle 5 and a corrugated cardboard lid member 1 closing the receptacle. The lid member is of generally conventional design except that the corrugations run in a direction parallel to the sides. The lid has downwardly extending end flaps 2 for securing the lid member to the receptacle during transit. As appears from FIG. 5, the end flaps are tucked back through a suitable cut-out 10 in the end walls 8 of the rigid reinforcing frame. In this manner, the rigid reinforcing frame serves as a further support and load distributing means for the packed container when the same is picked up by means of the end flaps with the fingers of the handler inserted in the cut-out 3 in the end wall 4 of the corrugated cardboard bottom member.

The receptacle of the container consists of three separate units which lock together when they are assembled. Two like ones of these units constitutes the rigid reinforcing frame 7 and the third unit is cardboard bottom member 9. The bottom member locks the rigid frame in position and, when assembled, forms a load-bearing and load-sustaining, rigid container.

The frame portion, as shown in FIGS. 1 and 2, is assembled from two halves, one half section of the frame being illustrated in FIG. 1. These sections are made of any suitable rigid material, pressed wood fibreboard, such as "Masonite," as well as plastic or wood veneer being useful. The assembled frame portion consists of two side walls 6 and two end walls 8 interconnecting the side walls to form a closed frame.

Each half section of the frame, which may be flattened or knocked down when the container is taken apart, consists of a flat side board constituting one side wall 6 and two end boards, each end board having exactly half the length of the end walls 8 so that two adjoining end boards form each end wall. To make this relative folding of the boards possible, they are slightly spaced apart by an amount approximating the thickness of the boards, as seen in FIG. 1. The boards are connected or jointed by metal or other suitable flexible strips 11 which are stitched or stapled to the boards at 13.

Since containers of this type are designed primarily for shipping goods requiring ventilation, holes 12 of any suitable size, spacing and distribution are preferably cut into the side walls 6 of the receptacle frame.

The bottom member 9 is made preferably of corrugated cardboard and serves not only to provide the bottom for the receptacle, thus defining a shipping space with the reinforcing frame, but also to lock the frame into position and thus to form the container. As shown in FIG. 3, this bottom member is of special design and is scored so that it may be readily folded about the frame in the desired manner.

The bottom member is of corrugated cardboard and the corrugations or flutes preferably extend lengthwise of the container, i.e. parallel to the side walls. This arrangement of the corrugation provides added strength for carrying the packed container when the end flaps of the lid member is tucked back behind the reinforcing frame and walls, the lid member also being of corrugated cardboard with the corrugations extending in the lengthwise direction.

The bottom member is an integral sheet of corrugated cardboard having a centrally positioned bottom portion 14 defined by rectangular score lines 15. At assembly time (see FIG. 4), two half sections of the frame, with their end boards being 90°, are placed upon the bottom portion 14 just inside the score lines 15, with the edges of the end boards adjoining each other so as to form the rectangular frame shown in FIG. 4.

Extending outwardly and lengthwise from the bottom portion 14 there are two end walls 4 which are bent upwardly along the score lines 15 to form the outer end walls of the receptacle portion, as shown in the section of FIG. 5. The two end walls 4 have extensions 18 separated from the end walls by a connecting web 21

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defined by parallel score lines 22, 22'. The width of the web 21 corresponds to the thickness of the end boards 8 of the frame so that the extensions may be folded over the boards, as shown in FIG. 5, thus securely to lock the two halves of the frame end walls placed between the corrugated cardboard end walls 4 and extensions 18. The extensions are provided with tabs 19 which enter respective slots 20 in bottom portion 14, thus combining the bottom member and the reinforcing frame into a unitary receptacle portion of the container. The end walls 4 also have locking tabs 4a inwardly and downwardly extending through the cut-outs 10 in the rigid end walls of the frame portion.

As shown, superior locking action is obtained in accordance with one preferred embodiment of this invention by providing lateral flap portions 16 extending from bottom portion 14 and from a part of end walls 4. These bottom flap portions are scored along lines 23, 24 and 25. Score lines 24 are in alignment with the end score lines 15 of the bottom portion while score lines 23 extend diagonally between the score lines 24 and 25, the latter lines being in alignment with the lateral score lines 15 of the bottom member. In this manner, an exceedingly strong locking action is obtained by the webs defined by score lines 24 and 25 when the same are folded inwardly along score line 23, as indicated in FIG. 4.

It can readily be seen from the foregoing description that the shipping container of the instant invention is of novel design which will allow the parts to be shipped in a flat form ready for instant assembly. In addition, the combination of the composition board and the corrugated cardboard cut down the weight of the box and still give it extreme rigidity and weight bearing characteristics. If it is desired to ship or store fruits and vegetables for longer periods of time, the side boards and the downwardly extending extension portions of the corrugated cardboard portion as well as the inside face of the bottom and the lid may be coated with a suitable material to prevent absorption of juices and thus prevent deterioration of these parts. This can also be resorted to where the boxes are to be used again. The strength and rigidity of a shipping container capable of being shipped in flat sections and then assembled as shown herein is far superior to that attained by other structures now being used in this act.

In order to obtain maximum strength and rigidity it is necessary that the corrugations at the bottom and lid members extend lengthwise of the container and parallel to the side walls.

In the use of the rigid side and end board construction it is assured that the shape of the box will always be maintained regardless of the amount of moisture that may have been absorbed by the corrugated portion of the container. In addition, the use of a multiple end wall precludes the possibility of the outside upwardly extending corrugated members of the container becoming softened by the juices of the fruits contained therein and, therefore, they are only subjected to the atmospheric moisture (humidity).

In addition, the design of the shipping container as a whole is such that when the containers are stacked in close relation to one another, as in cold storage or in shipping, the sides of the containers are inset sufficiently to provide horizontal spaces in each row of the tier and thus insure the complete circulation of air in the shipping containers, as is required under governmental regulations. In addition, the folding of the top down over the ends provides additional horizontal air spacings connecting the longitudinal spacing, thus affording complete surrounding of the box by circulating air.

The outstanding advantages of a shipping container of the described type will be self-evident to the skilled in the art. It is manufactured from inexpensive materials, is relatively light, readily knocked down and just as

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readily assembled into an unusually strong and rigid container structure having all the advantages of containers made exclusively of rigid composition board or of corrugated cardboard while having none of their respective disadvantages. The strength of the container is unexpectedly increased by having the corrugations of the bottom and lid members extend lengthwise of the container. The locking action of the bottom member is considerably increased by the special configuration of the flap portions 16 which impart surprising rigidity to the assembled container. The extension of the end flaps of the lid member into gripping engagement with the rigid frame makes it possible to support the packed container by the frame, rather than merely by the weaker cardboard lid, when the container is carried. Finally, making the rigid frame of two half sections which may be readily flattened saves additional space in transporting the component parts of the container to any point of assembly, the corrugated cardboard bottom member as well as the corrugated cardboard lid member also being readily flattened before they are folded into their ultimate shape around the reinforcing frame.

What I claim is:

1. A shipping container comprising a receptacle consisting of three-locked-together but separable units, two of said units being alike and interchangeable, said two units constituting two half sections of a frame portion of the container, each half section consisting of a flat rigid side board and two rigid end boards permanently connected thereto in abutting relationship by means of flexible hinges and forming inwardly extending right angles therewith, the flat rigid side boards forming parallel side walls of the frame portion and each of the two inwardly extending rigid end boards forming parallel end walls of the frame portion, adjoining ends of the inwardly extending end boards having elongated cutouts located centrally between the side walls, said two half sections of the frame portions forming the confining and load bear-

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ing unit of said receptacle, and the third one of said units being an integral corrugated cardboard bottom member comprising a central rectangular bottom portion, containing a suitable plurality of locking cutouts, two end walls forming upwardly extending right angles therewith to thus form the outer locking end wall of the receptacle, a locking tab extending inwardly from each of said outer locking end walls and bent downwardly through a respective pair of said cutout contained in the end boards to lock said ends in butting relation, two extensions substantially parallel to said outer end walls, a suitable plurality of locking tabs projecting from each of said extensions arranged to lock said extensions in parallel position with the outer end walls and when inserted in the suitable plurality of locking cutout slots contained in the bottom member, to thus rigidly contain the two inwardly extending sections of the rigid end boards, webs of the approximate thickness of the rigid frame portions inwardly extending end boards integrally connecting the outer end walls and the extensions, the upwardly extending side portions of the central rectangular bottom portion being extended to provide stiffening means for both said side portions and said upwardly extending outer end walls.

2. A shipping container according to claim 1 wherein the corrugations of the integral corrugated bottom member extend lengthwise of the container parallel to the side walls.

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