United States Patent [19]

Bonnot

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[45] **Aug. 13, 1974**

[54] **POLYVALENT PLIABLE CONTAINER**

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[22] Filed: **Apr. 20, 1972**

[21] Appl. No.: **246,023**

[52] **U.S. Cl.** ..... **220/1.5,** 220/97 R, 220/4 F

[51] **Int. Cl.**..... **B65d 87/00**

[58] **Field of Search** ..... 220/1.5, 4 F, 97 R, 6

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Primary Examiner—William I. Price
Assistant Examiner—Steven M. Pollard
Attorney, Agent, or Firm—Edward E. Dyson; John J. Byrne

[57] **ABSTRACT**

A folding container that is used by all forms of transportion, such as rail, ship and air including a floorboard provided with means of assembly for the placement of side and end panels to thus form an enclosure, the rigidity of which is assured by placing a top on the structure obtained. The surface of this top is embossed to correspond with reliefs and spaces on the bottom of the floorboard facilitating the stacking of several containers either folded or unfolded for use. The resulting folding, multipurpose container is compact in size and is strong enough to resist the great accelerations and decelerations of air travel.

7 Claims, 17 Drawing Figures

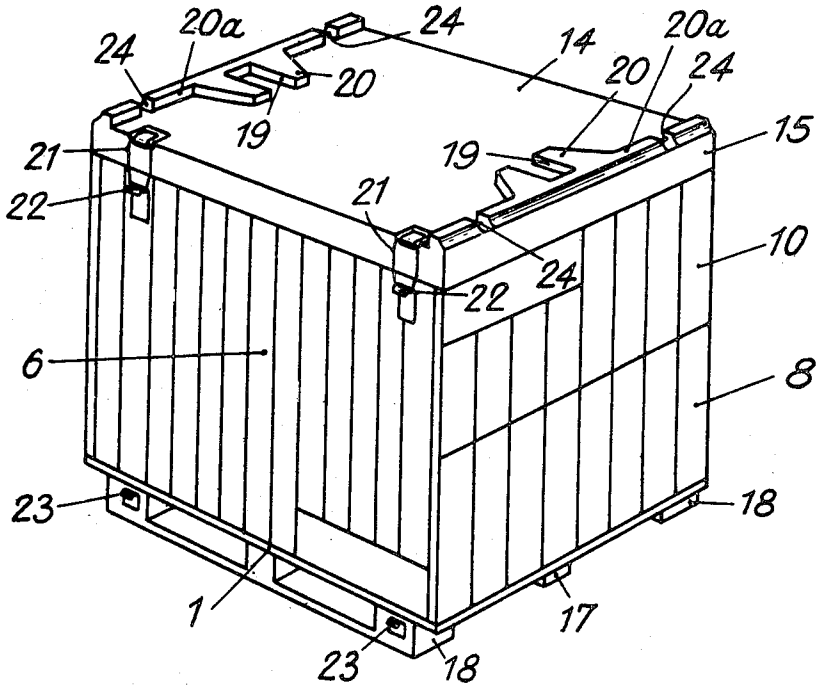

FIG. 1

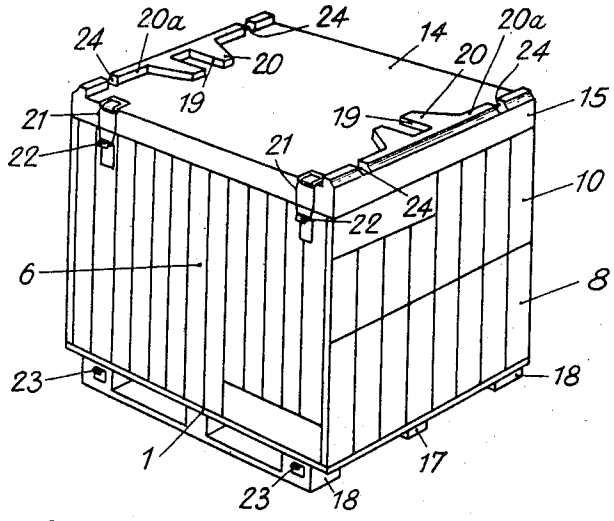

FIG. 2

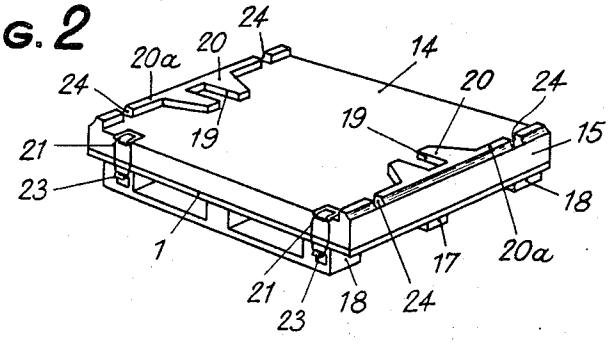

FIG. 3

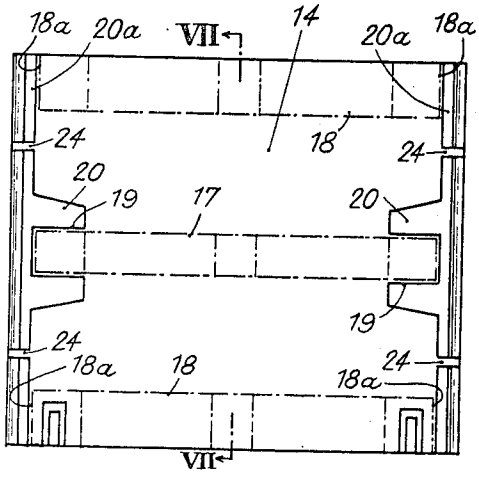

FIG. 4

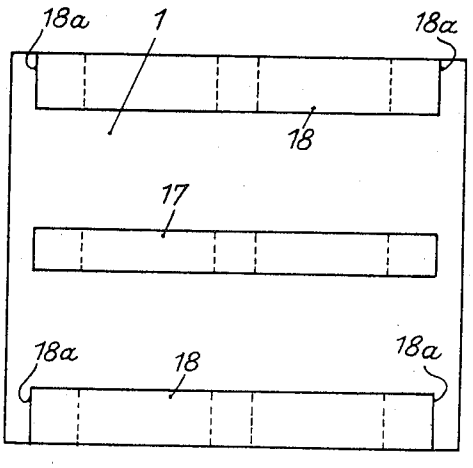

FIG. 5

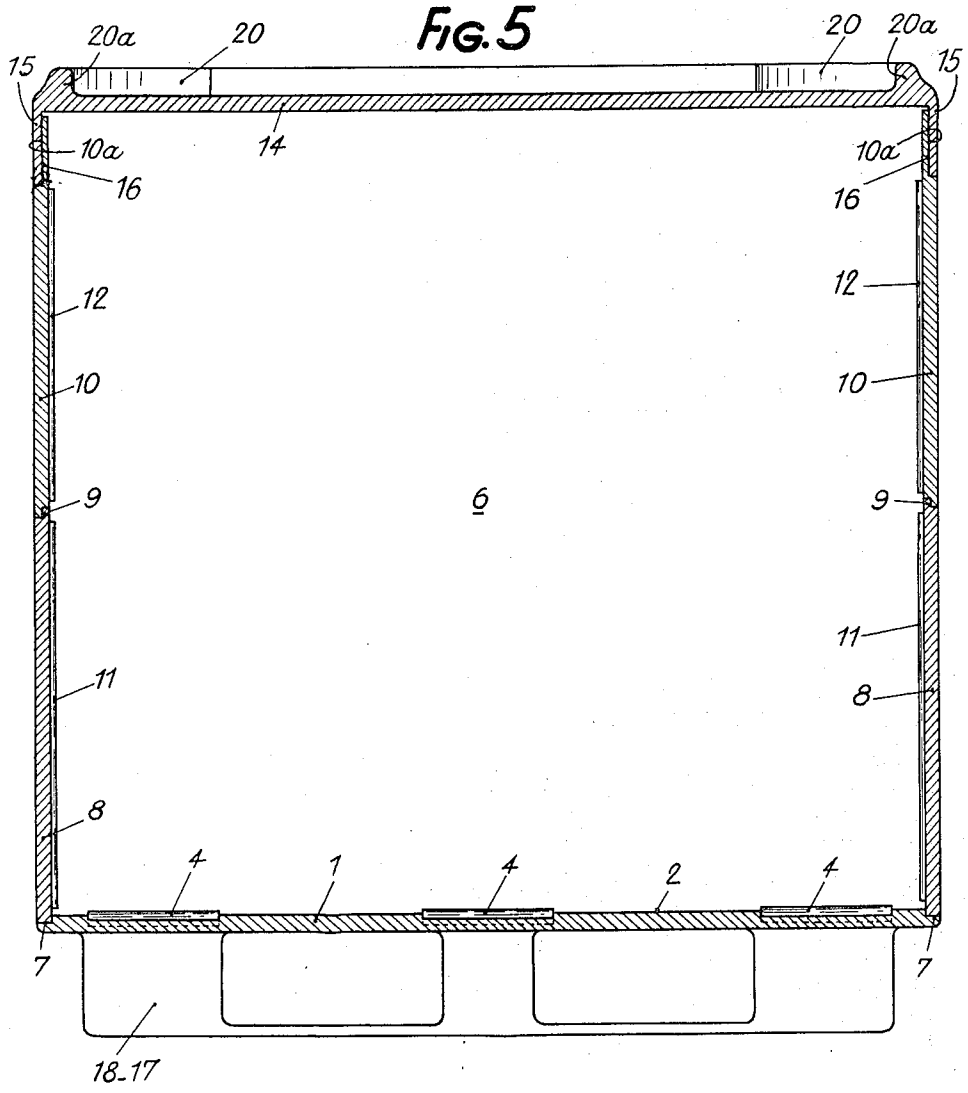
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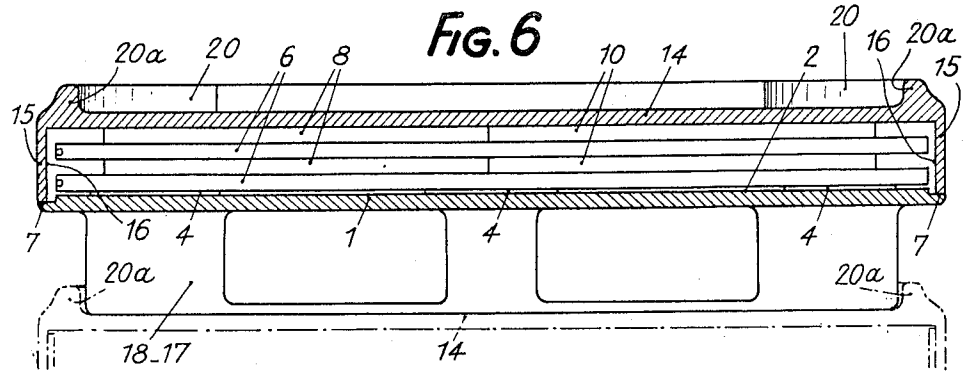
FIG. 6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18-17
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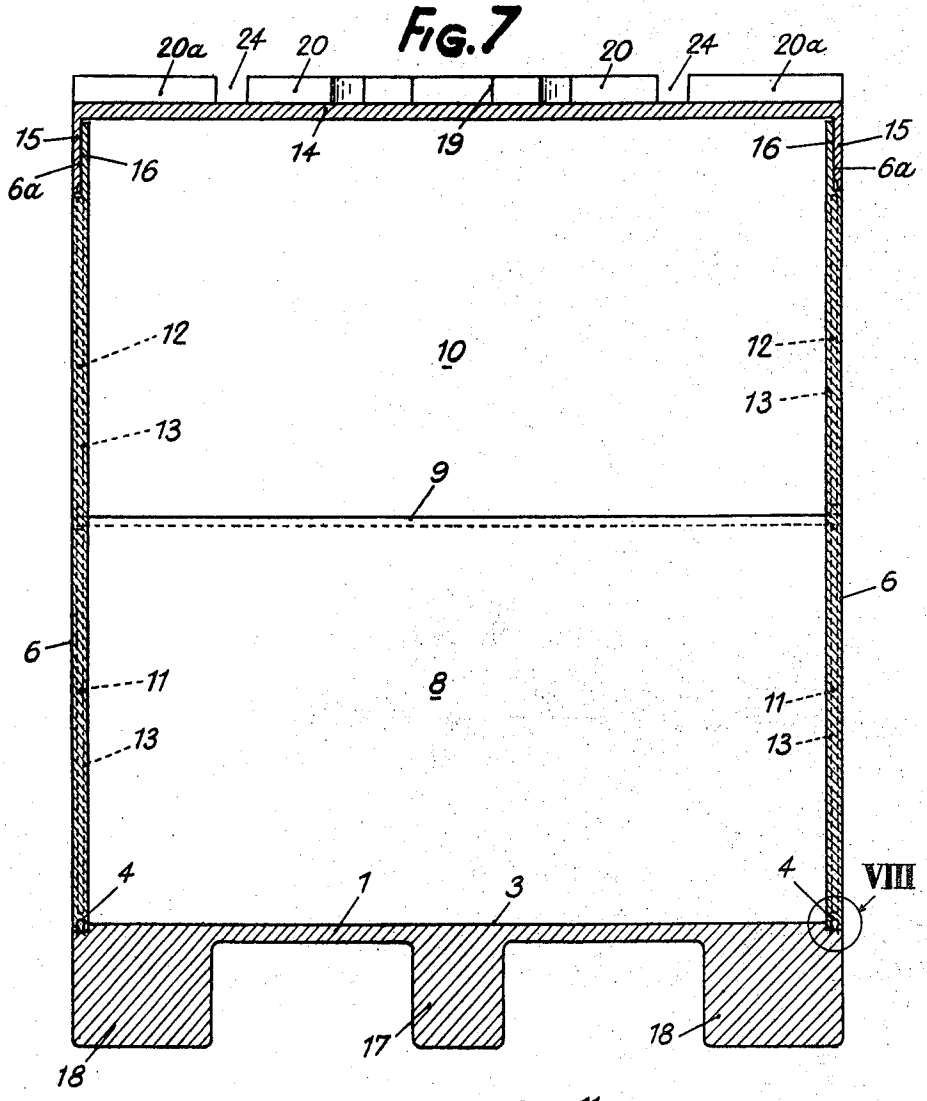
FIG. 7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VIII
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FIG. 8

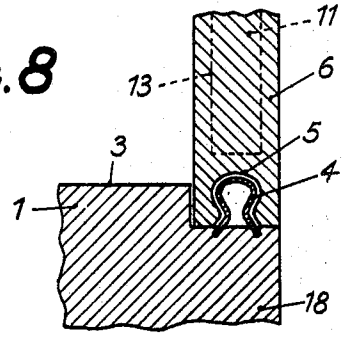
11
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FIG. 9

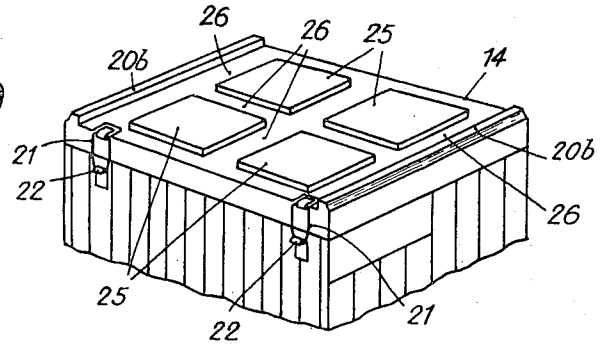


FIG. 10

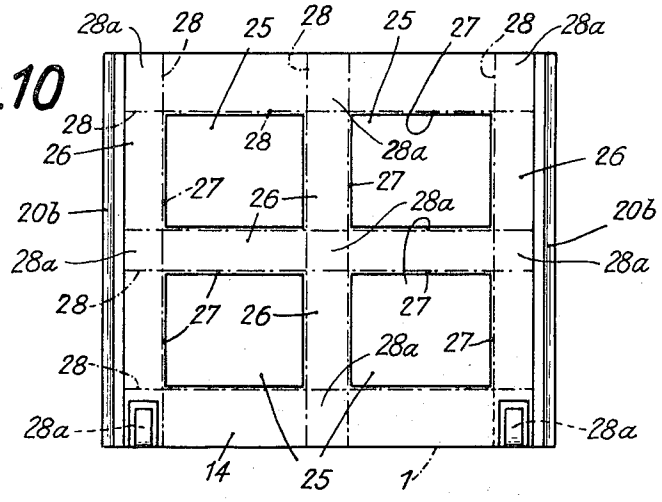


FIG. 11

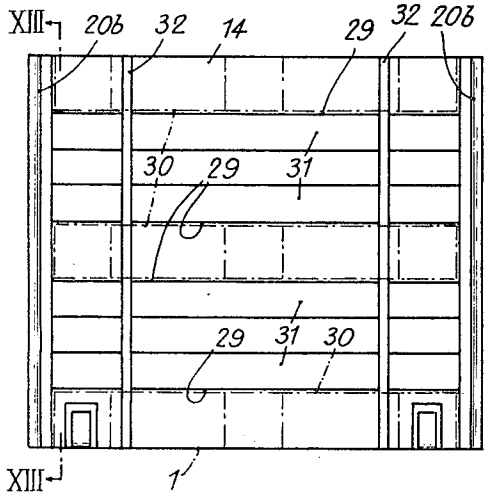


FIG. 12

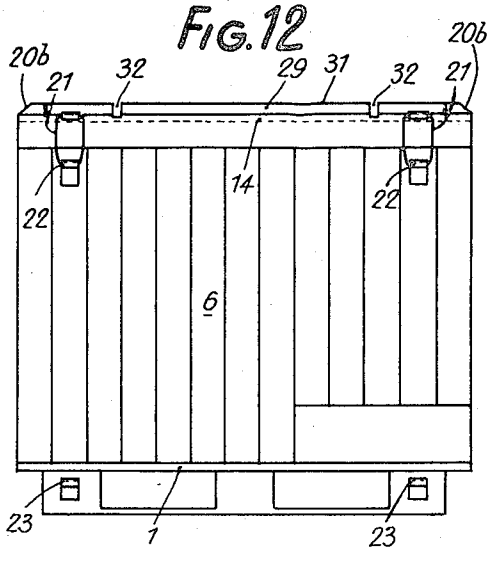


FIG. 13

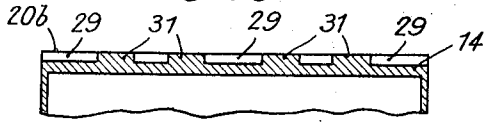


FIG. 14

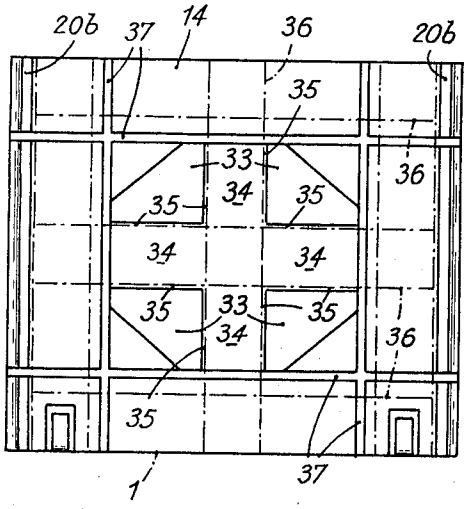


FIG. 15

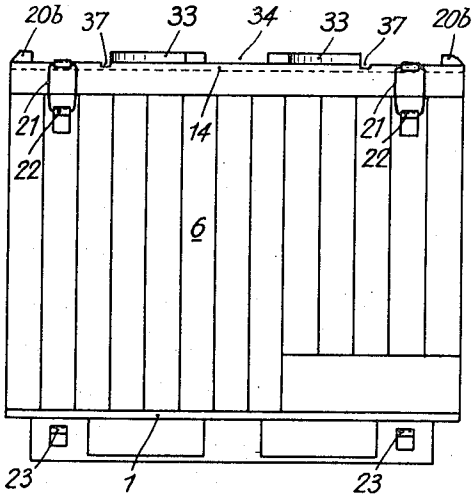


FIG. 16

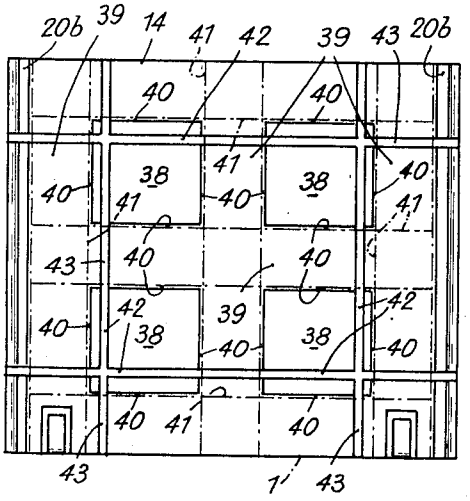
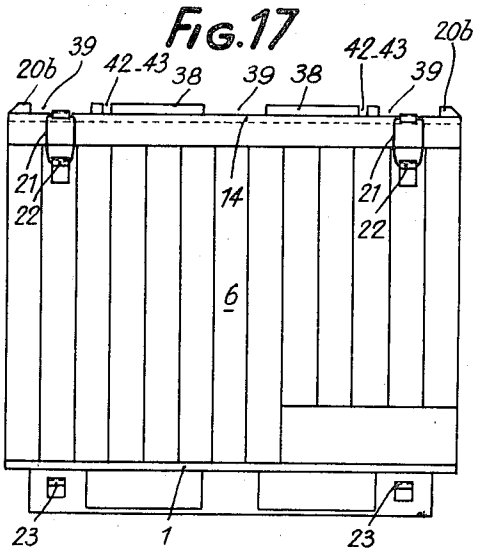


FIG. 17



POLYVALENT PLIABLE CONTAINER

A principal objective of this invention is to provide a folding, multipurpose container answering the requirements of all types of transportation such as rail, ship and air which is directly transferred from one mode of transportation to aonther without difficulty.

The distribution of merchandise comprises all operations between the end of production lines and access to the consumer, such as packaging, the formation of shipment units, stocking, transport and delivery. An objective of this invention is to provide a folding multipurpose container capable of withstanding the great acceleration and deceleration of air travel.

Another objective is to provide a folding multipurpose container, the elements of which are easily and readily assembled and which can be stacked in a reduced space.

This folding multipurpose container of this invention includes a floorboard provided along the lengths of its upper side with means for assembling side panels, the vertical sides of which are flanged to allow the placement of end panels to form an enclosure, the rigidity of which is assured by affixing a top to the structure thus obtained. The surface of this top is embossed to mesh with the reliefs and spaces on the bottom of the floorboard, thus facilitating the stacking of many containers either folded or unfolded for use.

The surface of the top of the container is set off by polygonal reliefs forming spaces between them which allow these reliefs, once several containers are stacked, to be inserted into spaces and reliefs prearranged on the bottom of the containers. These spaces correspond to the size of the polygonal reliefs on the surface of the top of the container.

According to another embodiment of the invention, the surface of the top of the container presents ribs and spaces into which the reliefs and spaces on the bottom of the container are inserted when several containers are stacked.

Because of the reliefs and spaces on the surface of the top of the container, as well as on the bottom of the floorboard, the strength of both the tops and floorboards of these containers is reinforced, while the containers' balance is assured when stacked, whether folded or unfolded for use.

The means of assembly provided along the edges of two sides on the top side of the floorboard of the container includes appropriate metal flanges evenly spaced to correspond with grooves on the lower portion of the side panels, thus guiding and securing the panels upon assembly. Each of the end panels has two indented flanges along its edge. Each flange is provided near its two vertical ends with an appropriate metal flange meant to match grooves made on the vertical edge of each side panel, thus guiding and securing the end panels upon assembly. The periphery of the top of the container is provided with a rim, the inside part of which touches the exterior face of the upper part of the panels once they are assembled. The lower side of the rim, once the panels are removed, rests on the top of the floorboard, providing chamber to house the panels once the container is folded.

These and other objects of the invention will become more apparent to those skilled in the art by reference to the following detailed description when viewed in light of the accompanying drawings wherein:

FIG. 1 is a perspective of the container unfolded for use;

FIG. 2 is a perspective of the container of FIG. 1 in its folded mode;

FIG. 3 is a sketch of the surface of the top of the container;

FIG. 4 is a bottom view of the container's floorboard;

FIG. 5 is a side view of the container with the side panels removed;

FIG. 6 is a vertical cross-section of a folded container;

FIG. 7 is a cross-section along the line VII—VII of FIG. 3;

FIG. 8 is a detailed enlarged cross-section of the sector included by circle VIII of FIG. 7;

FIG. 9 is a fragmented portion of a container viewed in perspective showing a second embodiment of the invention;

FIG. 10 is a top view of the container shown in FIG. 9;

FIG. 11 is a top view of another embodiment;

FIG. 12 is a side view of the container shown in FIG. 11;

FIG. 13 is a partial cross-section of the container of FIGS. 11 and 12 along line V—V in FIG. 11;

FIG. 14 is a top view of another embodiment of the container;

FIG. 15 is a side view of the container in FIG. 14;

FIG. 16 is a top view of another embodiment; and

FIG. 17 is a side view of the container in FIG. 16.

Referring now to the drawings wherein like numerals indicate like parts, the container in the diagram represents a floorboard 1 provided along the edges 2 of its upper surface 3 (see FIGS. 5, 7 and 8) with metal flanges of appropriate size 4, evenly spaced along the edges 2 and adapted to cooperate with grooves 5 on the lower portion of two ribbed side panels 6. This construction guides and retains the panels upon assembly.

The upper part of the floorboard 1 has two grooves 7 along the edges of both ends of the container. The grooves 7 support the lower portion of two ribbed end panels 8 to which two other ribbed end panels 10 are rigidly affixed with a dovetailed joint 9.

End panels 8 and 10 are provided close to their vertical ends with appropriate metal flanges 11 and 12, which are analogous to or different from flanges 4 on floorboard 1 of the container, so long as they are arranged to fit with grooves 13 along the vertical edge of each side panel 6, to guide and retain panels 8 and 19 upon assembly.

The periphery of top 14 of the container is provided with a rim 15, the interior surface 16 of which, upon assembling side panels 6 and end panels 8 and 10, joins exterior notched surface 6*a* of panels 6 and exterior notched surface 10*a* of panels 10 (see FIGS. 5 and 7). The bottom of floorboard 1 is formed with reliefs 17 and 18 to provide the container with adequate support on the ground. Relief 17 is arranged to fit, as shown in FIG. 3, spaces 19 formed by reliefs 20 on the surface of top 14 to allow several containers to be stacked either folded or unfolded for use as shown in FIG. 2. When folded, end edges 18*a* of reliefs 18 on floorboard 1 appear next to the inside surface of border 20*a* of reliefs 20 of top 14.

The container has clasps 21 which attach to hooks 22 on one of the panels 6 when unfolded and to hooks 23 on floorboard 1 when the container is folded (see FIG. 2). Top 14 presents notches 24 on reliefs 20 to permit eventual banding of the unfolded container and the surface of its upper side is roughened to improve the friction between reliefs 17 and 18 when the containers are stacked.

To assemble the container, starting from a folded position such as shown on FIG. 6, top 14 is separated from floorboard 1 and the two side panels 6 are slid into place along flanges 4. After this, one need merely place end panels 8 by fitting flanges 11 into grooves 13 to allow partial loading of the container. When the container is filled, one places end panels 10 in the same way as panels 8. At the end of the operation, top 14 is placed and fasteners 21 are attached to hooks 22.

When the container is to be unloaded, top 14 is lifted. After partial unloading, panels 10 are removed, allowing easy access to the lower portion of the container to complete unloading.

These actions are performed in reverse to obtain a folded container such as shown on FIGS. 2 and 6. All that remains to be done is to fasten clasps 21 to hooks 23 on floorboard 1 or engage the lock, if hooks and clasps are replaced by other means of locking or fastening.

According to FIG. 9, top 14 has rectangular reliefs 25 so arranged as to create between them and side reliefs 20*b* spaces 26 which, when several boxes are stacked, permit these reliefs to be inserted into grooves 27 between reliefs 28 on the bottom of the container's floorboard 1 (see FIG. 10).

The grooves or rectangular openings 27 divide the supporting base of the container floorboard into six reliefs or stringers 28, four along the outer perimeter of the base and two extending perpendicular to each other and intersecting the four along the outer perimeter intermediate their lengths. These are nine points of intersection, 28*a*, of the reliefs or stringers 28. The stringers are connected to the underside of the floorboard at these points and the weight of the container is evenly distributed thereover.

FIGS. 11 and 12 show another embodiment of this invention. Here, the surface of top 14 is ribbed, creating grooves 29 into which the bottom of floorboard 1 bearing reliefs 30, prearranged as in FIGS. 3 and 4, will fit. In order to strengthen top 14 additional ribs 31 are provided (see FIGS. 12 and 13). In this embodiment, notches 32 are hollowed on the surface of top 14 in order to permit as with notches 24 the eventual banding of the container unfolded for use.

Another embodiment for carrying out the invention is shown in FIGS. 14 and 15. As in FIGS. 9 and 10, top 14 bears on its surface reliefs 33, which in this case are substantially triangular and create spaces 34. The above correspond to spaces 35 and reliefs 36 on the bottom of floorboard 1 allowing several containers to be stacked. The surface of top 14 has notches 37 for the eventual banding of the unfolded container.

Another embodiment of this invention is shown in FIGS. 16 and 17. As in FIGS. 9 and 10, top 14 also has reliefs 38 on its surface which are rectangular in shape and are arranged in such a way as to create spaces 39 between them and lateral reliefs 20*b*. These correspond to spaces 40 and reliefs 41 arranged on the bottom of floorboard 1 to permit the two structures to nest when several boxes are stacked. Reliefs 38 bear notches 42 corresponding to notches 43, similar to notches 37 shown in FIGS. 14 and 15, all of which are adapted to permit eventual banding of the unfolded container.

In a general manner, while there has been disclosed effective and efficient embodiments of the invention, it should be well understood that the invention is not limited to such embodiments as there might be changes made in the arrangement, disposition, and form of the parts without departing from the principle of the present invention as comprehended within the scope of the accompany claims.

I claim:

1. A container comprising a floorboard having a first pair of side portions and a second pair of side portions defining a top surface, a pair of side panels having vertical edges and upper and lower edges, interengaging means between said first pair of side portions and the lower edges of said side panels, a pair of end panels having vertical edges and upper and lower edges, second interengaging means between the vertical edges of said side panels and the vertical edges of said end panels, a top structure adapted to engage the tops of said side and end panels to form an enclosure, a support structure affixed to the underside of said floorboard, said support structure comprising a planar base having four spaced, rectangular openings therein arranged in a rectangular pattern and defining load-supporting stringers, said base being spaced from the underside of said floorboard and having side openings therein below each of said side portions of said pair of side portions of said floorboard for receiving container handling equipment.

2. The container of claim 1 wherein said interengaging means are evenly spaced metal flanges on said first pair of side portions which are received in grooves in the lower edges of the side panels guiding and securing them upon assembly.

3. The container of claim 1 wherein said top structure includes embossing on the upper surface thereof conforming to said rectangular openings in said support structure, said embossing being received in said rectangular openings when said containers are stacked.

4. The containers of claim 1 wherein the stringers defined by said rectangular openings in said base comprise three longitudinal stringers and three transverse stringers intersecting said longitudinal stringers, and said base is affixed to said underside of said floorboard at the points of intersection of said stringers.

5. The container of claim 1 wherein said top structure includes slots in its top surface for receiving banding straps.

6. The container of claim 1 wherein said top structure includes a continuous downwardly extending rim having a lower edge engaging said floorboard to form an enclosed container for said side and end panels when in disassembled condition and laid flat on said floorboard.

7. The container of claim 1 wherein said base has opposite outer side edges which are spaced laterally inwardly from at least one of said pair of side portions of said floorboard, the spaced defined thereby receiving bars of a container handling sling which engage the underside of the floorboard.

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