



US 20030052038A1

(19) **United States**

(12) **Patent Application Publication**

Boersma

(10) **Pub. No.: US 2003/0052038 A1**

(43) **Pub. Date: Mar. 20, 2003**

(54) **CORRUGATED CONTAINER WITH INTEGRAL PALLET**

(52) **U.S. Cl. 206/598; 229/101; 229/939; 229/120.36**

(76) Inventor: **Benjamin Boersma**, Caledonia, MI (US)

(57) **ABSTRACT**

Correspondence Address:
Waters & Morse, P.C.
400 Ledyard Building
125 Ottawa, N.W.
Grand Rapids, MI 49503 (US)

A corrugated container for shipping products includes a product storage compartment mounted and an integral pallet for lifting the container with a forklift vehicle. The container side walls include opposed end panels and opposed side panels. One pair of panels extends to the bottom of the product storage compartment and is integral with storage compartment bottom panels. The other pair of panels extends further than the bottom of the storage compartment to a container bottom and is integral with container bottom panels. The distance between bottoms is sufficient to accommodate the tines of a forklift vehicle. In one embodiment, the side walls are collapsible for storage and transport when empty. Stacking blocks formed of wrapped honeycomb material are positioned between the container bottom and the storage compartment bottom to support the storage container bottom above the container bottom. The blocks are spaced apart to permit insertion of forklift tines.

(21) Appl. No.: **10/244,967**

(22) Filed: **Sep. 16, 2002**

Related U.S. Application Data

(60) Provisional application No. 60/322,116, filed on Sep. 14, 2001.

Publication Classification

(51) **Int. Cl.⁷ B65D 5/00; B65D 19/00; B65D 25/04**

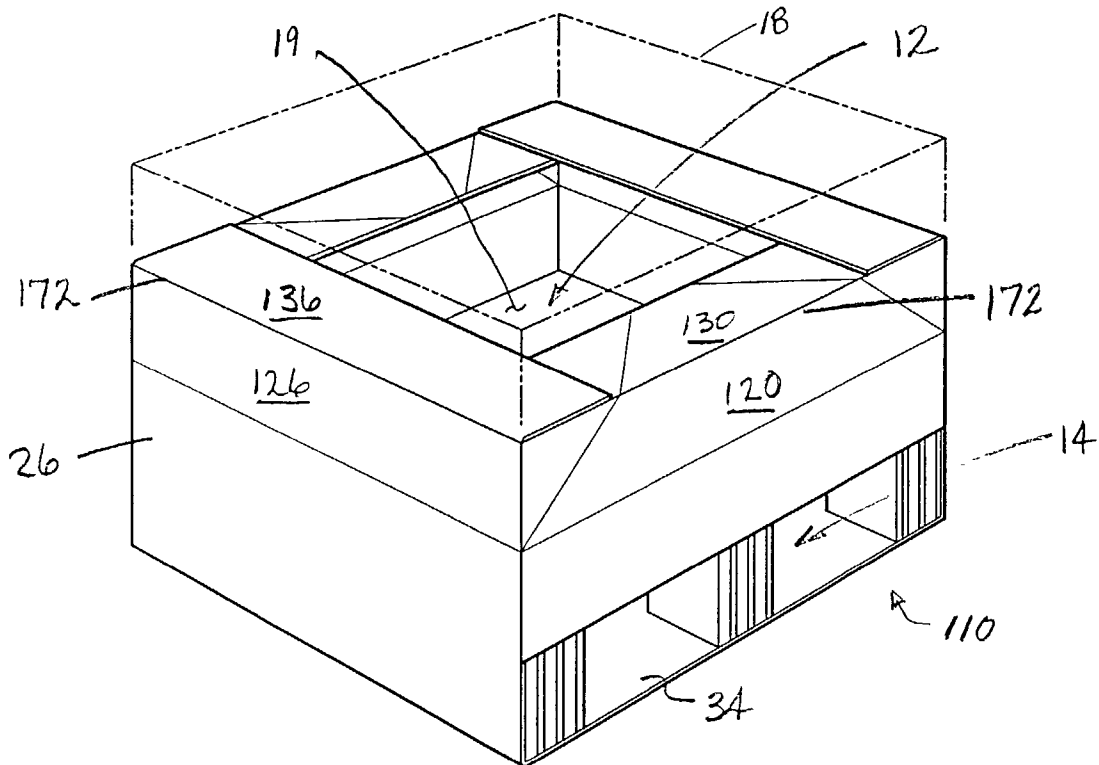


FIG. 1

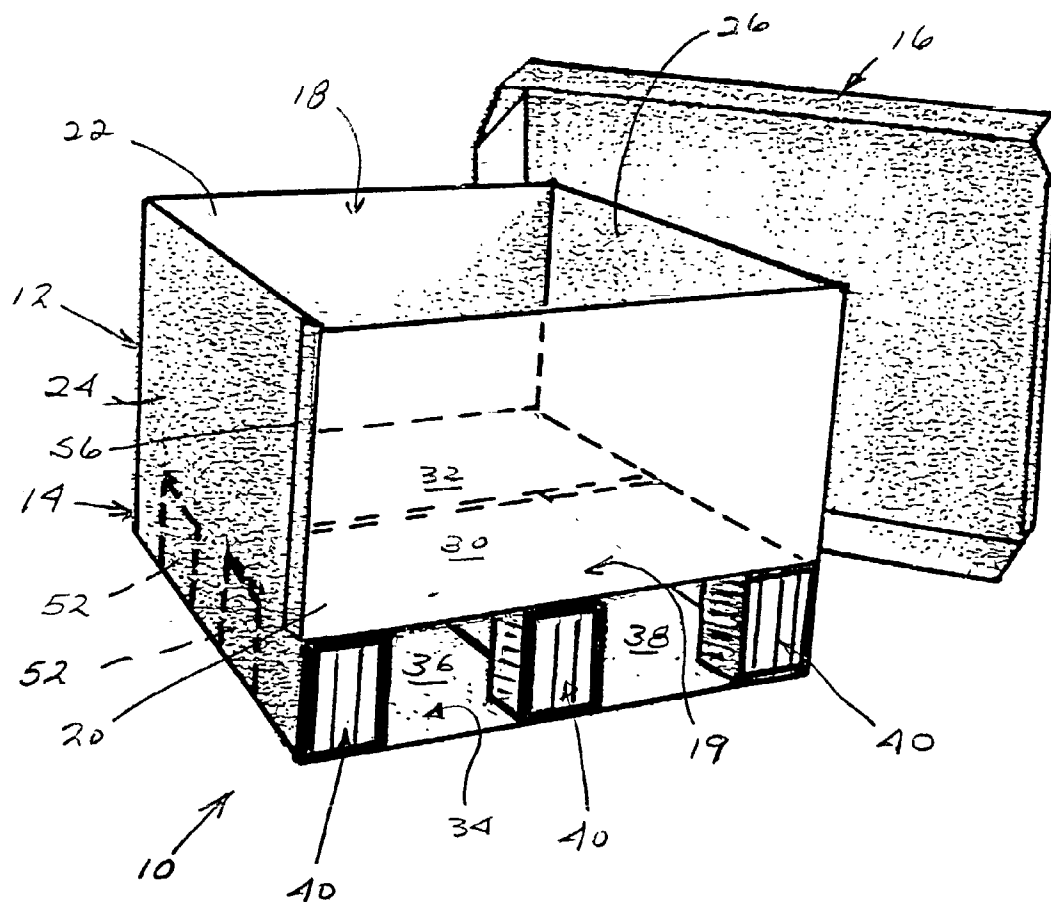


FIG. 2

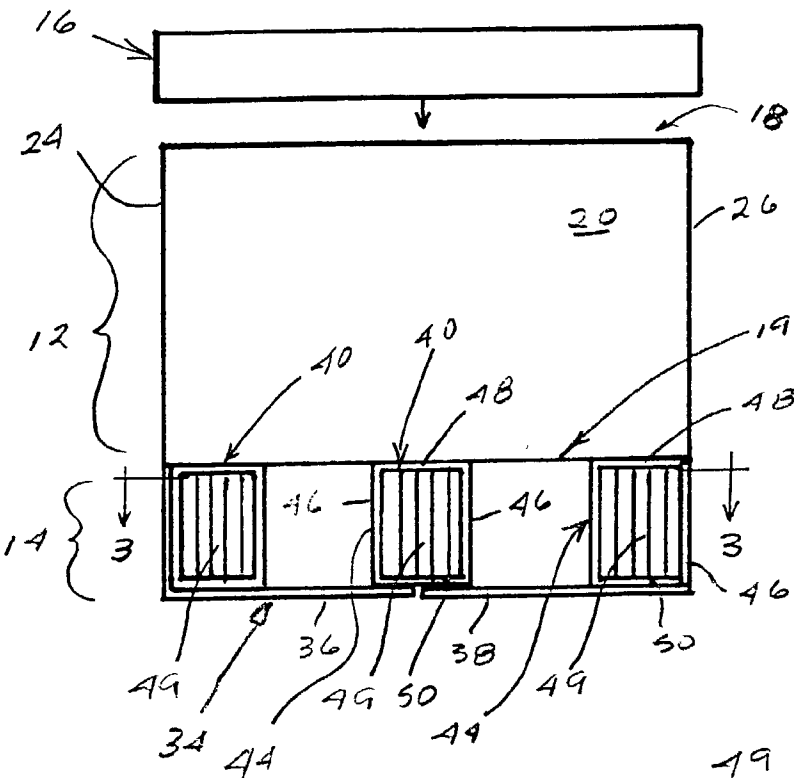


FIG. 3

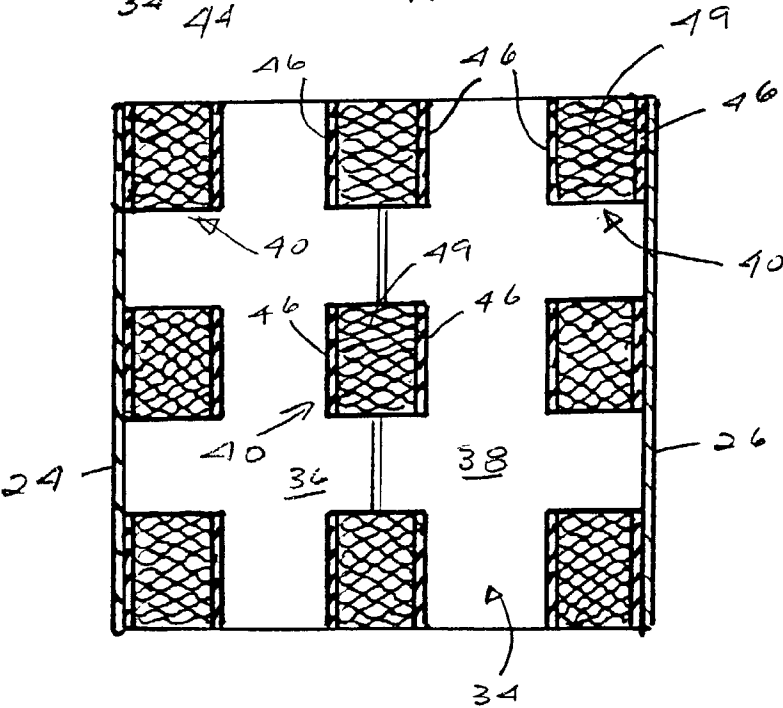


FIG. 4

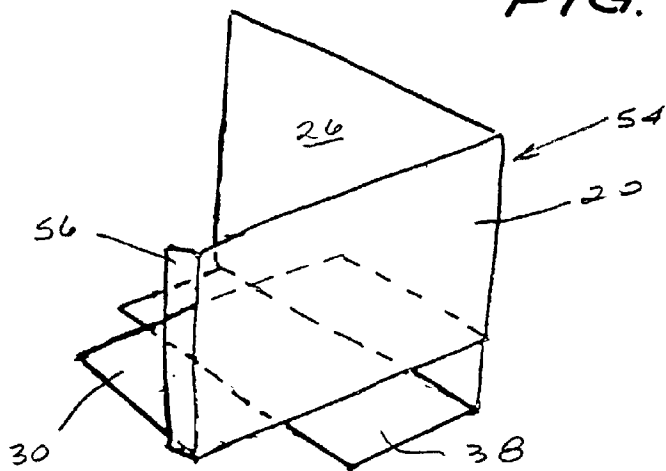
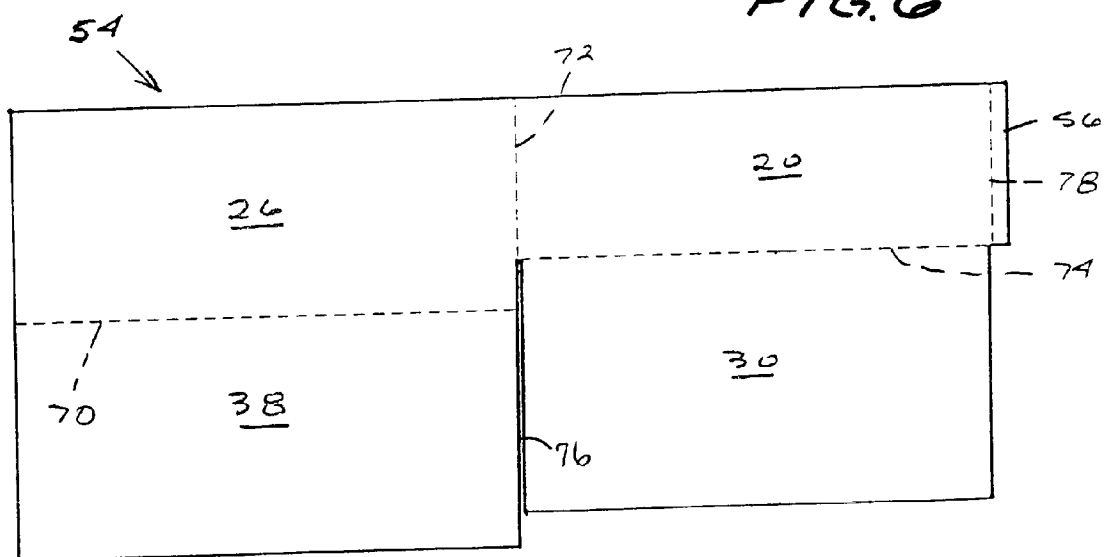


FIG. 6



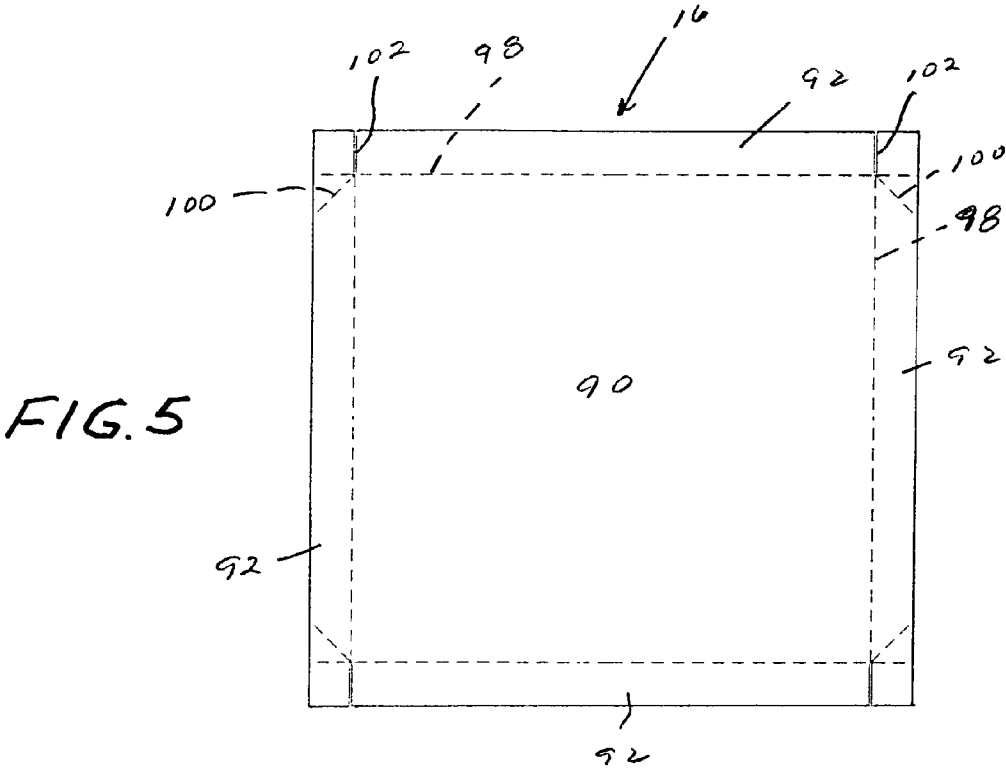


FIG. 7

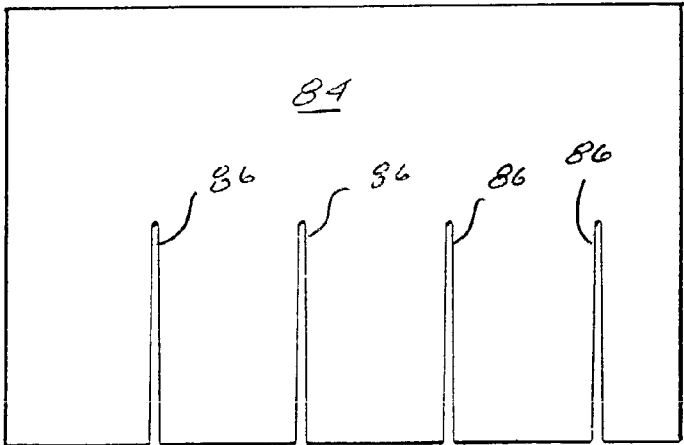
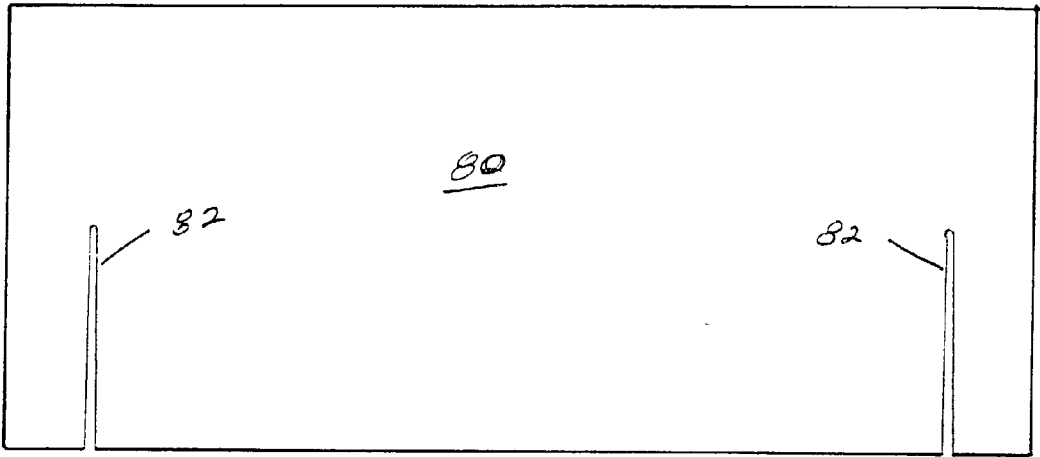


FIG. 8

FIG 9

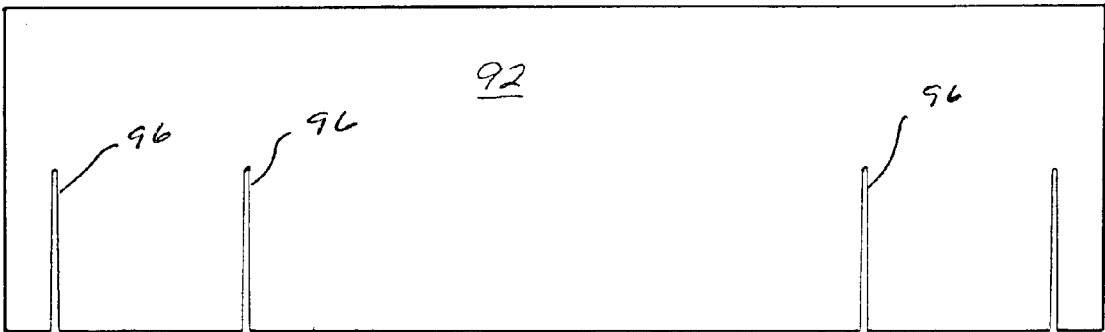
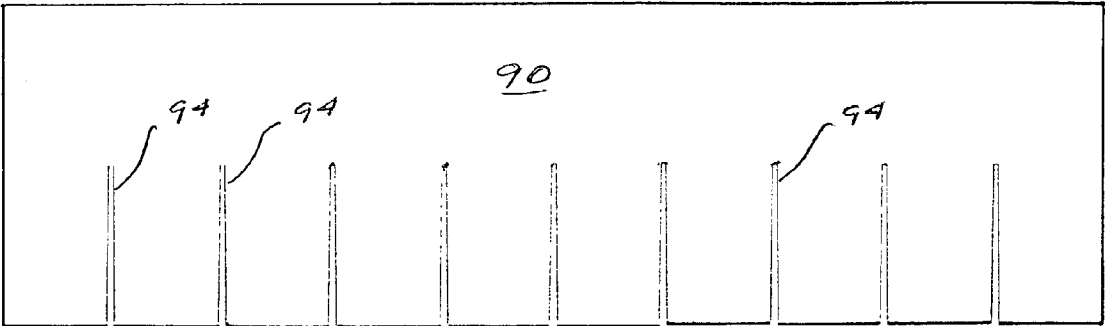
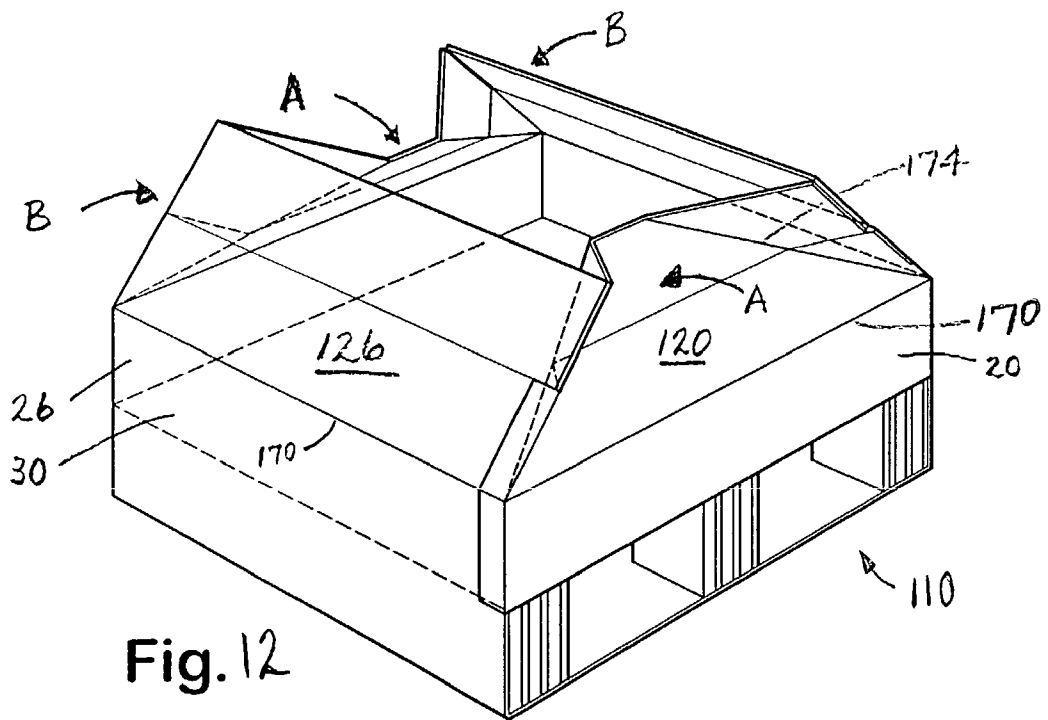
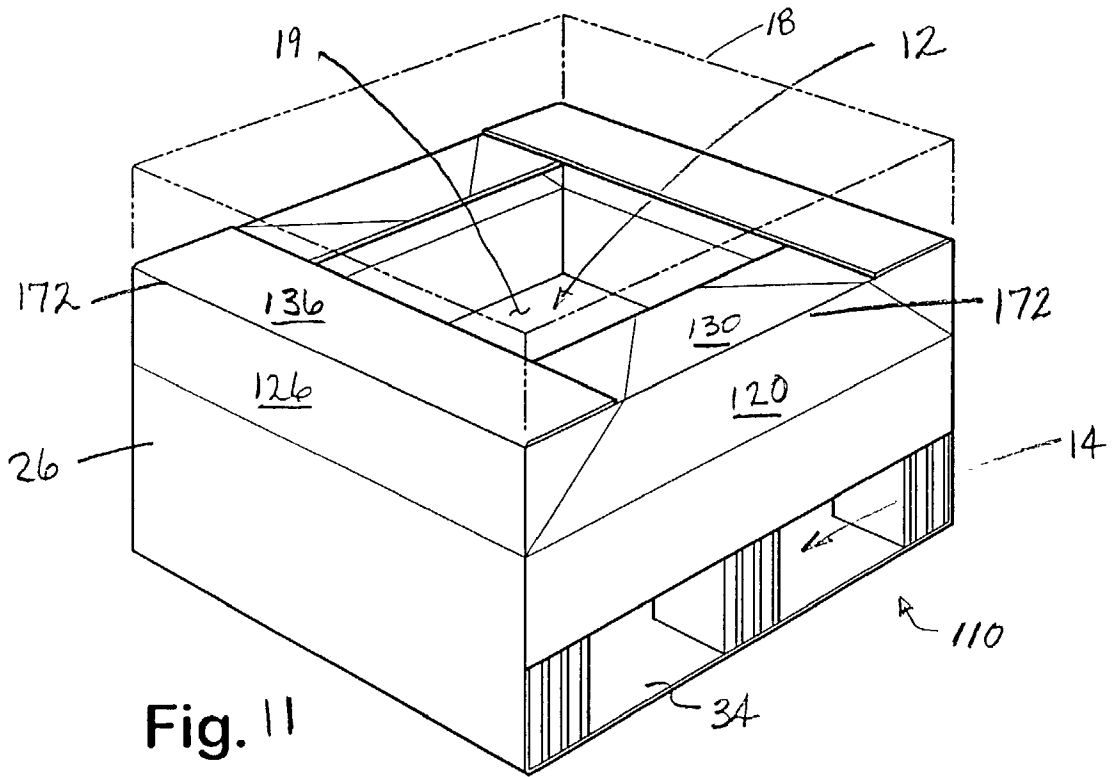


FIG. 10



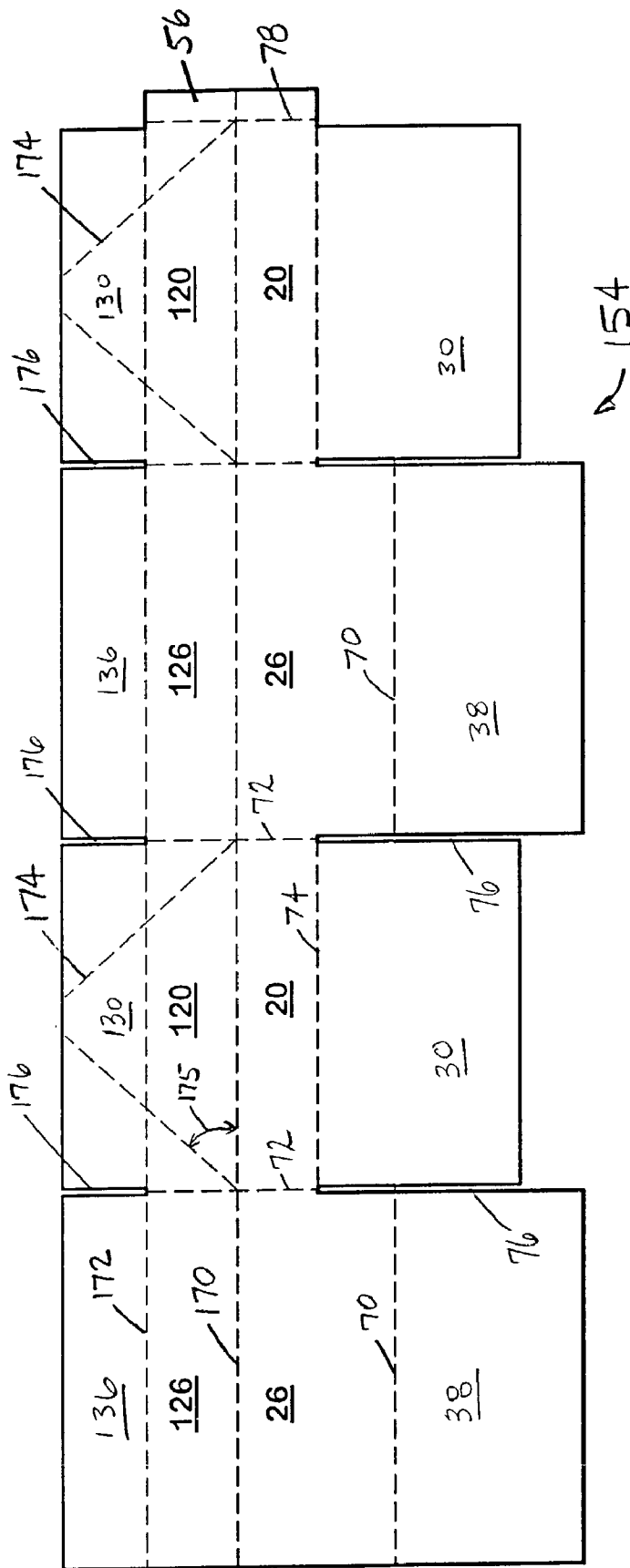


Fig. 13

CORRUGATED CONTAINER WITH INTEGRAL PALLET

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0001] Not Applicable.

RELATED APPLICATIONS

[0002] This application claims the benefit of U.S. Provisional Application S. No. 60/322,116, filed Sep. 14, 2001.

BACKGROUND OF THE INVENTION

[0003] Corrugated fiberboard boxes are widely used for packaging products for shipment or transportation. In many applications, the containers are transported by placing them on wooden skids or pallets and then moving the palletized containers by means of a forklift truck wherein tines of a lifting fork fit between upper and lower surfaces of the wooden pallet. Large boxes or containers, sometimes called bulk boxes, often are placed on a skid before the box is filled with products. Skid size boxes are sometimes stitched or fastened to a skid on manufacture and shipped to the user as a single unit.

[0004] This process involves some drawbacks. Separate wooden pallets are expensive and subject to breakage and have to be disposed of separately from the corrugated fiberboard containers. This is a special concern in Europe, where environmental laws restrict the use of materials that are not readily recyclable, which wooden skids are not.

[0005] An object of the present invention is to provide an improved recyclable corrugated container that incorporates its own corrugated pallet or skid.

SUMMARY OF THE INVENTION

[0006] A corrugated container for shipping products includes a product storage compartment mounted on an integral pallet for lifting the container with a forklift vehicle. The container product comprises opposed end panels and opposed side panels, the end panels extending from the top to the bottom of the product storage compartment, the side panels extending from the top downwardly further than the bottom of the storage compartment to a container bottom. The distance between the bottom of the product storage compartment and the bottom of the container is sufficient to accommodate the tines of a forklift vehicle therebetween. A storage compartment bottom panel is integral with at least one end panel and is folded upwardly therefrom. A container bottom panel is integral with at least one side panel and is folded upwardly therefrom. The container further comprises a plurality of spaced stacking blocks, preferably formed of wrapped honeycomb material or other suitably crush resistant material, positioned between the container bottom and the storage compartment bottom so as to support the storage container bottom at an elevated position above the container bottom. The stacking blocks are spaced sufficiently between the side panels that the tines of a forklift vehicle can fit into the space between the storage compartment bottom and the container bottom from two or four directions in order to pick up the container.

[0007] In one aspect of the invention, the panels of the container are formed of two blanks or fabrication sheets,

with each sheet including an end panel, a side panel, a container bottom panel, and a storage compartment bottom panel. The blank includes score lines for folding the panels in their desired position. The lower ends of the end and side panels are offset so that the lower portion of one panel is folded upwardly to form the storage compartment bottom, while the lower portion of the other panel is folded upwardly to form the container bottom.

[0008] In another aspect of the invention, the panels of the container are formed of at least one fabrication sheet, with the at least one sheet including an end panel, a side panel, a container bottom panel, and a storage compartment bottom panel. The fabrication sheet includes score lines for folding the panels in their desired position. The lower ends of the end and side panels are offset so that the lower portion of one panel is folded upwardly to form the storage compartment bottom, while the lower portion of the other panel is folded upwardly to form the container bottom. The fabrication sheet further includes score lines for folding an upper portion of the end and side panels over the top of the container for reducing the volume of the container.

[0009] The present invention provides a cost effective box having an integral corrugated pallet and eliminates the problems associated with the use of separate wooden pallets.

[0010] These and other features and advantages of the present invention are described in detail below and shown in the appended drawings.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

[0011] FIG. 1 is a perspective view of a container with integral pallet in accordance with the present invention.

[0012] FIG. 2 is an end view of the container of FIG. 1.

[0013] FIG. 3 is a sectional view taken along lines 3-3 of FIG. 2.

[0014] FIG. 4 is a perspective view showing one fabrication panel of the present invention shown folded into its assembled configuration.

[0015] FIG. 5 is a plan view of the container top in unassembled form.

[0016] FIG. 6 is a plan view of one of two fabrication panels of one embodiment of the invention.

[0017] FIG. 7 is a plan view of one interior partition panel employed in the present invention.

[0018] FIG. 8 is a plan view of another interior partition panel employed in the present invention.

[0019] FIG. 9 is a plan view of still another interior partition panel employed in the present invention.

[0020] FIG. 10 is a plan view of still another interior partition panel employed in the present invention.

[0021] FIG. 11 is a perspective view of a container with integral pallet in accordance with a further embodiment of the invention.

[0022] FIG. 12 is a perspective view of the container of FIG. 11 in a partially folded configuration.

[0023] FIG. 13 is a plan view of a fabrication panel for the container of FIGS. 11-12.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0024] Referring to the drawings, a container 10 constructed in accordance with the present invention is shown in FIG. 1. Container 10 is preferably formed of corrugated fiberboard. Other comparable corrugated material could be employed.

[0025] Container 10 is generally rectangular and comprises an upper storage compartment 12 and a lower pallet compartment 14 positioned below the storage compartment. A top 16 fits on an open top 18 of the storage compartment. Storage compartment 12 comprises opposed end panels 20 and 22 and opposed side panels 24 and 26. End panels 20 extend downwardly from the open top 18 of the container to the bottom 19 of the storage compartment, which is formed by bottom panels 30 and 32. Bottom panels 30 and 32 are integral with end panels 20 and 22, respectively, and are formed from a common blank or sheet of fabrication material by folding the end panels upwardly along a score line between the end and bottom panels so that the panels are perpendicular with each other.

[0026] Side panels 24 extend to a bottom 34 of the container, which is formed by container bottom panels 36 and 38. Panels 36 and 38 are integral with side panels 24 and 26 and are joined at the lower edges of those panels. Panels 36 and 38 are formed into position by folding the panels along a score line at the lower edge of the side panels.

[0027] As formed, the container has a storage compartment bottom 19 positioned above a container bottom 34, with the distance between the bottoms being sufficient to receive the lifting tines of the forklift vehicle. A distance of about 4¾ inches is typical, but other distances will work.

[0028] A plurality of stacking blocks 40 fit between the bottoms of the storage compartment and the container in order to support the storage compartment bottom at its elevated position above the container bottom. While stacking blocks 40 can be formed of any material that is sufficiently rigid to maintain the spacing between the container and storage compartment bottoms, a particularly effective and relatively inexpensive stacking block is formed of a wrapped honeycomb fiberboard material having a plurality of adjoining vertical tubular cells. This honeycomb material is relatively inexpensive and lightweight and yet possesses sufficient crush resistant characteristics to support most anticipated loads in the storage compartment of the container. Honeycomb material having ½ inch to ¾ inch wide cells formed of multi-weight material (such as 42-33-42 weight paper) works satisfactorily in the present invention. Desirably, the stacking blocks are formed of the same type of material as the rest of the container, so that the entire container can be reused or recycled as one material.

[0029] In a typical carton, which may be 45 inches or more on a side, a preferred stacking block arrangement is nine stacking blocks, arranged in rows of three at the ends and middle of the container. This configuration is shown in FIG. 3.

[0030] The stacking block sizes are selected so that the tines of a forklift vehicle can fit between stacking blocks and

can be inserted into the pallet portion of the container sufficiently to lift the container. The stacking block sizes are also selected in order to provide sufficient column strength for the load anticipated for the container. A typical block size is approximately nine inches long, five inches wide, and four inches high.

[0031] As shown in FIG. 2, the honeycomb portions 49 of the stacking blocks are enclosed with a corrugated wrapper 44. The wrapper includes vertical panels 46, a top panel 48 that abuts the bottom 19 of the storage compartment, and a bottom panel 50 that abuts the container bottom 34. The top and bottom wrapper panels close the top and bottom sides of the cells and improve the crush resistance of the cells, while vertical panels 46 provide vertical stability for the cells and protects the sides of the cells from accidental injury from the forklift tines. The honeycomb portion 49 is glued to the wrapper as a structural unit. Wrapped honeycomb material is available commercially in assembled form. The stacking blocks themselves are glued, preferably with hot melt glue, in position in the container. The wrapper facilitates gluing the honeycomb material in the container.

[0032] While the foregoing honeycomb stacking blocks provide ample crush resistance in a lightweight and inexpensive package, other stacking blocks would be functionally acceptable. The stacking blocks, for example, could be formed of a roll or log of single faced corrugated material, with one or two logs being wrapped with a corrugated wrapper. The log supports, however, are more expensive. Weight and expense, durability, and crush resistance are factors that affect the design selection of the stacking blocks.

[0033] As shown in FIG. 1, the container has openings for inserting forklift tines in either end of the box. The openings for the tines could be placed in all four directions by removing cutout portions 52, shown in phantom, in the side panels of FIG. 1. These cutout portions are between the respective stacking blocks and between the bottoms of the storage compartment and container, in a manner similar to the openings in the ends of the container.

[0034] The container of the present invention is formed from one or more sheets of fabrication material, with each sheet of material containing a number of panels, and score lines being formed in the fabrication material for folding the material at the proper places in order to construct a container. While the whole container could be formed of a single sheet of fabrication material, the skid size boxes are quite large and would require very large fabrication equipment. A more desirable configuration, shown in FIG. 4, employs two blanks or sheets of fabrication material 54, each of which constitutes one half of the container. The layout of fabrication sheet 54 is illustrated in FIG. 6 prior to folding the container into its desired shape. Fabrication sheet 54 comprises a side panel 26, an end panel 20, a container bottom panel 38 that forms half of the container bottom, and a storage compartment bottom panel 30 that forms half of the storage compartment bottom. A flap 56 along a side edge of the end panel folds over an adjoining edge of a side panel of the other half of the container and is glued thereto in order to make a single container out of the two fabrication sheets. The other half of the container is identical to the fabrication sheet 54 shown in FIGS. 4 and 6, with the two sheets fitting together to form a complete storage compartment. Flaps 56 are attached to the sides of the adjoining section of the

container by staples (called stitching) or by glue or the like. As shown in FIG. 6, fabrication panel 54 has score lines 70 between side panel 26 and container bottom panel 38, while score line 72 is positioned between a side edge of side panel 26 and end panel 30. Another score line 74 is formed between a bottom edge of end panel 20 and bottom panel 30. A slot 76 is formed between inner edges of panels 38 and 26 and panel 30 so that panel 30 can be folded along score line 74 and then oriented perpendicularly to panel 26 by folding panel 20 along score line 72. Another score line 78 is formed between flap 56 and a side edge of end panel 20 for folding the flap perpendicularly to end panel 20.

[0035] If desired for specific products, the interior of the container can be subdivided in a conventional manner using interfitting perpendicular partition panels, as shown for example in FIGS. 7-10. Panel 80 in FIG. 7, for example, has slots 82 therein, and this panel is mounted perpendicular to panel 84, shown in FIG. 8, which has slots 86 therein. The panels are positioned perpendicularly to each other and one of the panels is inverted, with the slots 82 fitting into slots 86, thereby providing a subdivided insert panel for holding individual products in the container.

[0036] Panels of a somewhat different configuration are reflected in panels 90 and 92 in FIGS. 9 and 10 respectively. Panel 90 has slots 94 therein, while panel 92 has slots 96 therein. When the panels are arranged perpendicularly and one of the panels is inverted, slots 94 fit in with slots 96 in order to provide a matrix of individual product holder partitions in the container.

[0037] An advantage to the present invention is that a rigid container having an integral pallet can be formed from two sheets of fabrication material and a plurality of relatively inexpensive support blocks. This construction provides a secure, rigid container formed of a single, reusable and recyclable material.

[0038] Alternative constructions of the present invention are possible, subject to the limitations of equipment and tooling for fabricating the containers. For example, as stated above, the entire container could be formed of a single sheet or more than two sheets of fabrication material. Also, the bottoms of the container and storage compartment could be formed by flaps extending all the way across the container on one or both sides of the container instead of two flaps that extend halfway across. The advantage to the present construction is that a single die can be used for producing both sides of the container. Also, the bottom of the storage compartment or container can be reinforced by a rectangular insert support layer positioned at the bottom of the storage compartment.

[0039] The materials from which the present invention are constructed are preferably conventional corrugated fiberboard materials. These come in various thicknesses, and a thickness can be selected depending upon the load that needs to be supported. A one ply, two ply, or three ply material is employed in the preferred practice of the present invention, depending on the application.

[0040] The illustrated configuration of the container of the present invention has an open top, and a top or lid 16 fits on the open top. Lid 16 has a top panel 90 with downwardly extending flanges 92 formed at the edges of top panel 90. Desirably, the lid is formed of a single blank or sheet of

fabrication material 96, as shown in FIG. 5, and folded along score lines 98 and 100 to form the perpendicular edges of the box top. Slots 102 in the edges permit the edges of the boxes to be folded at right angles at the corner of the box. The box components are glued together to hold them in their constructed shape. An open top container with a separate lid is not the only type of container top closure feasible with the present invention. Other types of top closures, such as partial or full top flaps, can be used.

[0041] Referring now to FIGS. 11-13, a further embodiment of a container 110 constructed in accordance with the present invention is shown. Container 110 is preferably formed of corrugated fiberboard. Other comparable corrugated material could be employed.

[0042] Container 110 is generally rectangular and comprises an upper storage compartment 12 and a lower pallet compartment 14 positioned below the storage compartment 12. Storage compartment 12 comprises opposed end panels 20 and opposed side panels 26. End panels 20 extend downwardly from the open top 18 of the container to the bottom 19 of the storage compartment, which is formed by bottom panels 30. Bottom panels 30 are integral with end panels 20 and are formed from a common blank or sheet of fabrication material by folding the end panels upwardly along a score line 74 between the end and bottom panels 20, 30 so that the panels are perpendicular with each other.

[0043] Side panels 26 extend to a bottom 34 of the container, which is formed by container bottom panels 38. Panels 38 are integral with side panels 26 and are joined at the lower edges of those panels. Panels 38 are formed into position by folding the panels along a score line 70 at the lower edge of the side panels 26.

[0044] As shown in FIG. 13, the container of the present invention is formed from one sheet of fabrication material, although multiple sheets can be employed as described in the first embodiment. Each sheet of material contains a number of panels, and score lines being formed in the fabrication material for folding the material at the proper places in order to construct container 110. The layout of fabrication sheet 154 is illustrated in FIG. 13 prior to folding the container 110 into its desired shape.

[0045] Fabrication sheet 154 comprises side panels 26, end panels 20, container bottom panels 38, and storage compartment bottom panels 30. A flap 56 along a side edge of one end panel 20 folds over an adjoining edge of side panel 26 and is glued thereto. Flap 56 is attached to side panel 26 of the container by staples (called stitching) or by glue or the like. Fabrication panel 154 has score lines 70 between side panels 26 and container bottom panels 38, while score lines 72 are positioned between side panels 26 and end panels 30. Another score line 74 is formed between end panels 20 and bottom panels 30. Slots 76 are formed between inner edges of panels 38 and 26 and panels 30 so that panel 30 can be folded along score line 74 and then oriented perpendicularly to panel 26 by folding panel 20 along score line 72. Another score line 78 is formed between flap 56 and end panel 20 for folding the flap perpendicularly to end panel 20.

[0046] Additional score lines 170 are positioned between end and side panels 20, 26 and upper portions of end and side panels 120, 120 respectively. With fabrication panel 154

in unassembled form (i.e. laying flat), panel **154** could be folded in half across its breadth at score line **170**. Once assembled with flap **56** attached to side panel **26**, however, end and side panels **20**, **26** provide mutual support against folding on score lines **170**. Fabrication panel **154** is therefore provided with additional score lines **174** extending from score lines **170** at an angle **175** across upper portions **120** of end panels **20** to the upper edge of panel **154**. The angle of score lines **174** with respect to score lines **170** is substantially forty five degrees. As seen in **FIG. 12**, upper portions **120**, **126** can be folded inwardly on score lines **170** as upper portions **120** are simultaneously folded along score lines **174**. Upper portions **120**, **126** are also simultaneously folded relative to each other along a portion of score lines **72**.

[0047] Additional score lines **172** are provided between upper portions **120**, **126** of end and side panels **20**, **26** and optional flap portions **130**, **136**, respectively. With upper portions **120**, **126** in the upright/unfolded position, optional flap portions **130**, **136** can also be in an upright/unfolded position, extending the overall height of end and side panels **20**, **26**, as shown in phantom in **FIG. 11**. In the alternative, optional flap portions **130**, **136** are separated by slits **176** so that they can be folded along score lines **172** to form a lip partially enclosing the opening of container **110**. With flap portions **130**, **136** returned to the upright/unfolded position, upper portions **120**, **126** can again be folded along score lines **170**, **174** into a parallel relationship with the bottom of container **110**. **FIG. 12** illustrates the process of folding upper portions **120**, **126** inwardly. Arrows A, B show the folding of upper portion **120** inwardly on score lines **170**, **174**, and upper portion **126** along score line **170**, toward a parallel relationship with the bottom of container **110**. Container **110** occupies substantially less volume with upper portions **120**, **126** folded along score lines **170** into parallel relationship with the bottom of container **110**. With a lid for container **110** in place over the folded panels **120**, **126**, container **110** presents a more compact package for storage and transport. Container **110** can thus be more efficiently conveyed from its place of fabrication to a user who might place products into container **110** for further transport. Container **110** is also adaptable for use with smaller volume articles where a common container is desirable. In either instance, upon final delivery of products transported in container **110**, container **110** can be folded/collapsed into its more compact form for transport to a reuse or recycling location.

[0048] It should be understood that the foregoing is merely representative of the preferred practice of the present invention and that various changes in the arrangements and details of construction may be made herein without departing from the spirit and scope of the present invention.

I claim:

1. A container for shipping products, formed of corrugated sheet material, that includes an integral pallet for lifting the container with a forklift vehicle, the container having a product storage compartment comprising generally enclosed peripheral side walls, a bottom, and an open top, the side walls comprising opposed end panels and opposed side panels, the end panels extending from the top to the bottom of the product storage compartment, the side panels extending from the top downwardly further than the bottom of the storage compartment to a container bottom, the distance between the bottom of the product storage compartment and

the bottom of the container being sufficient to accommodate the tines of a forklift vehicle therebetween, at least one end panel being integral with a storage compartment bottom panel, at least one side panel being integral with a container bottom panel, the container further comprising a plurality of spaced stacking blocks positioned between the container bottom and the storage compartment bottom so as to support the storage container bottom at its elevated position above the container bottom, the stacking blocks being spaced sufficiently between the side panels that the tines of a forklift vehicle can fit into the space between the storage compartment bottom and the container bottom in order to pick up the container.

2. A container as in claim 1 wherein the sheet material comprises corrugated cardboard and the stacking blocks comprise honeycomb material, with the honeycomb material including a plurality of interconnected cells having substantially vertical side walls.

3. A container as in claim 2 wherein the honeycomb material is formed of fiberboard and further comprise a corrugated fiberboard wrapper enclosing the honeycomb material.

4. A container as in claim 3 wherein the stacking blocks are formed of honeycomb cardboard material having vertically oriented cells that are $\frac{1}{2}$ to $\frac{5}{8}$ inches across the cell walls.

5. A container as in claim 1 wherein the container further comprises forklift side entry openings in the side panels of the container between the container bottom and storage compartment bottom, the side entry openings being sized and positioned so as to permit a forklift vehicle to pick up the container from the side of the container, the support blocks being spaced sufficiently to permit the insertion of forklift tines into the container through the side entry openings for container lifting purposes.

6. A container as in claim 1 wherein the panels of the container are formed of one or more integral fabrication panels, with each fabrication panel comprising an end panel and an adjacent side panels at least one of the fabrication panels including a storage compartment bottom panel that forms at least a portion of the storage compartment bottom, the other fabrication panel including a container bottom panel that forms at least a portion of a container bottom.

7. A container as in claim 5, wherein the storage compartment bottom panel is contiguous with a lower edge of the end panel and the container bottom panel is contiguous with a lower edge of the side panel.

8. A container as in claim 5 wherein the container includes two fabrication panels, each panel including one end panel and one side panel, the fabrication panels fitting together to provide a complete container, the fabrication panels having overlapping flap portions at side edges thereof that fold over and attach to adjacent fabrication panels to form a complete container.

9. A container as in claim 8 wherein the two fabrication panels are substantially identical.

10. A container as in claim 1 wherein the panels of the container are formed of one or more integral fabrication panels, with each fabrication panel comprising an integral sheet of corrugated material including at least an end panel and a side panel, with an intersection therebetween being scored for folding the end panel into perpendicular orientation with respect to the side panel, at least a portion of the compartment bottom panel being formed from a lower

portion of the end panel, with the lower portion being scored for folding the end panel and compartment bottom panel into perpendicular orientation with respect to each other, at least a portion of the container bottom panel being integral with the side panel, a lower portion of the side panel being scored for folding the portion of the container bottom panel into perpendicular orientation with respect to the side panel.

11. A container as in claim 1 wherein the panels are formed of a material selected from the group consisting of one, two, and three ply corrugated fiberboard sheeting.

12. A container as in claim 1 wherein the side walls have a first score parallel to the storage compartment bottom, and at least one of the end panels and the side panels have a second score arranged at an angle to the first score to facilitate folding a portion of the side walls into a substantially parallel relationship to the storage compartment bottom.

13. A container as in claim 12 wherein the second score describes a forty five degree angle with respect to the first score.

14. A container constructed of corrugated sheet material forming peripheral side walls, a container bottom panel, and defining an open top; the container comprising a product storage compartment and an integral pallet structure, the product storage compartment comprising a product storage compartment bottom panel and the pallet structure compris-

ing a plurality of spaced supports positioned between the container bottom panel and the storage compartment bottom panel to support the storage compartment bottom panel above the container bottom panel, the spaced supports being formed and arranged so that the tines of a forklift vehicle can fit into the space between the storage compartment bottom panel and the container bottom panel and between the spaced supports; and the side walls comprising opposed end panels and opposed side panels, at least one end panel being integral with the storage compartment bottom panel and at least one side panel being integral with the container bottom panel.

15. A container as in claim 14 wherein the container is formed of at least one fabrication sheet, the fabrication sheet including score lines for creating a fold between an end panel and an adjacent side panel, between an end panel and a storage compartment bottom panel, and between a side panel and a container bottom panel.

16. A container as in claim 15 wherein the fabrication sheet further includes score lines for folding an upper portion of the end panel and an upper portion of the side panel into the open top of the container for reducing the volume of the container.

* * * * *