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Munroe

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[45] **Mar. 26, 1974**

[54] **DEMOUNTABLE PALLET AND CONTAINER ASSEMBLY**

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[52] **U.S. Cl.** ..... **217/12 R,** 108/53, 108/56, 206/65 R, 206/65 B, 217/15, 217/26.5, 217/43 A

[51] **Int. Cl.** **B65d 9/12**

[58] **Field of Search** ..... 217/12 R, 43 R, 43 A, 26, 217/26.5, 15, 47; 206/65 R, 65 B; 108/53, 55, 56

[56] **References Cited**

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[57] **ABSTRACT**

A pallet supports a demountable box-like container. In one embodiment, the container has side and end walls each including a plurality of vertically aligned wall panels, and a plurality of vertically spaced horizontal tray members are positioned within the container. Each tray member includes a plurality of article receiving cavities and a peripheral lip portion which projects outwardly between the edges of the wall panels for retaining the tray member. Corner posts connect the side wall panels to the end wall panels and have notches for receiving locking bands which surround the container and engage the ends of the wall panels through the notches. In another embodiment, the side and end wall panels of the containers are removably secured to the pallet by hook members mounted on the wall panels and which engage cross pins attached to the upper deck portion of the pallet.

4 Claims, 12 Drawing Figures

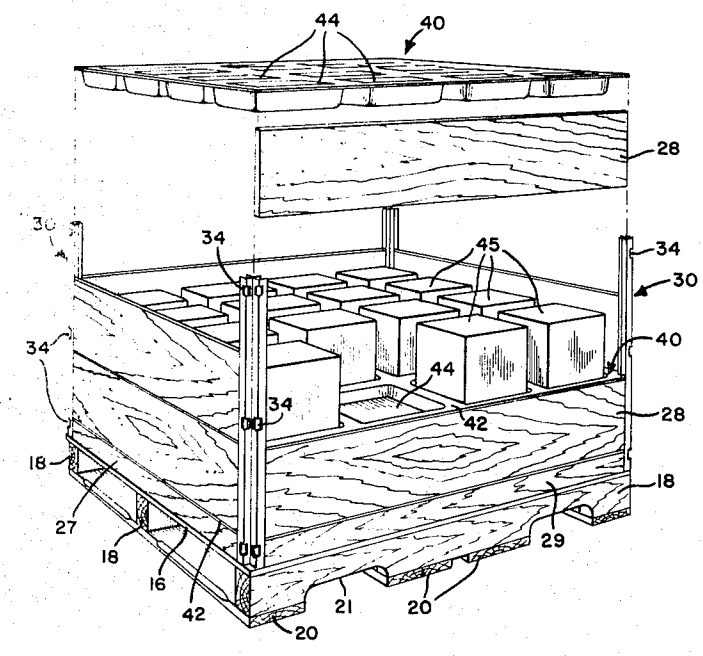


FIG-1

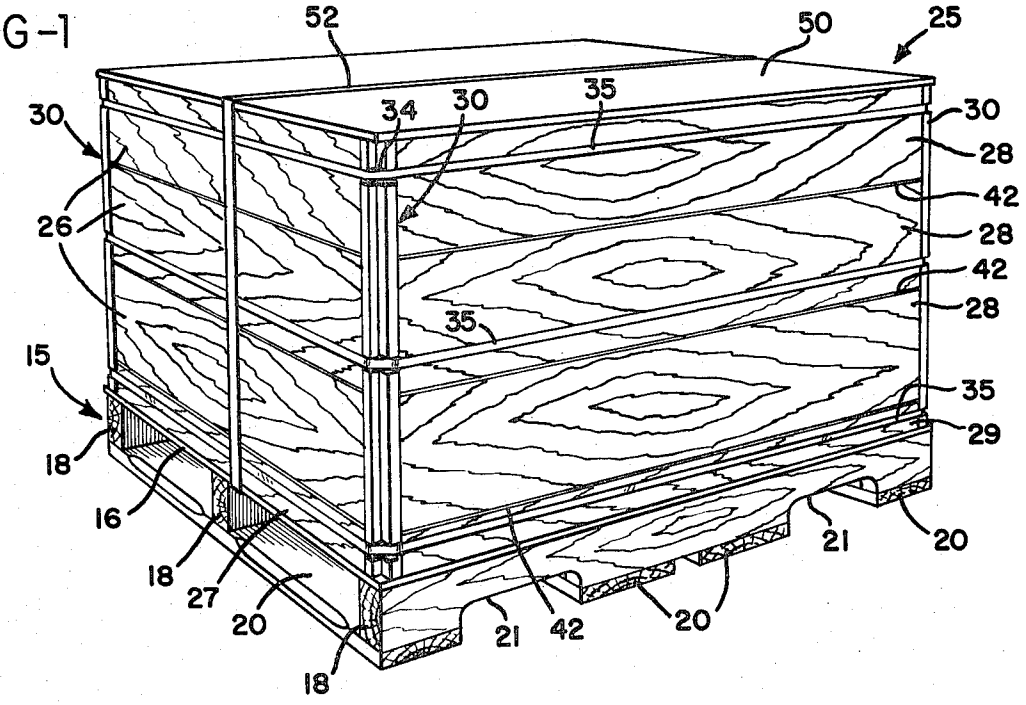
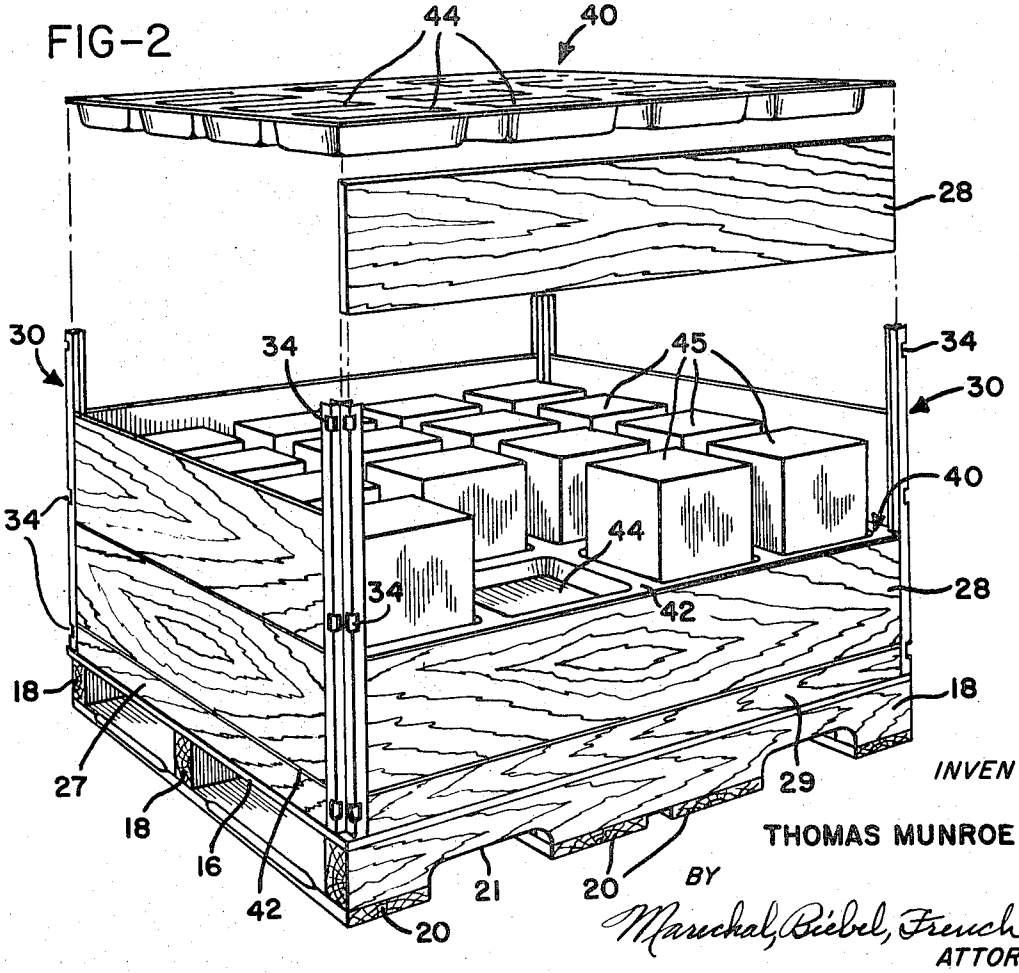


FIG-2



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FIG-3

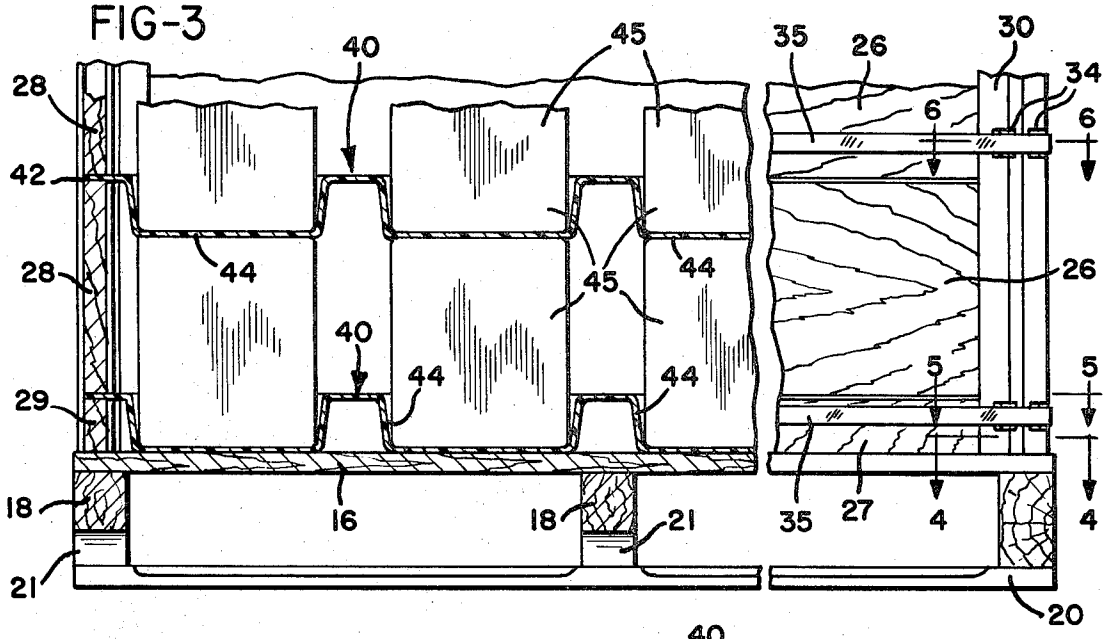


FIG-4

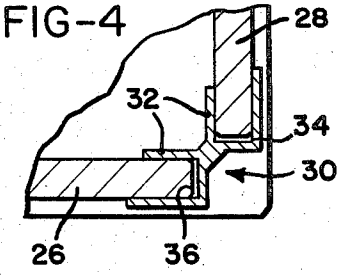


FIG-5

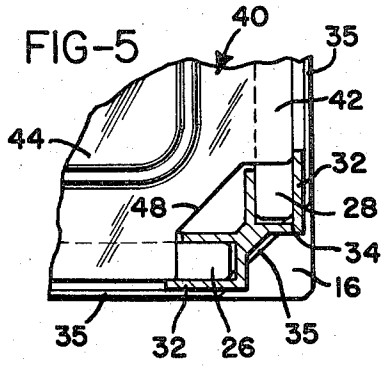


FIG-6

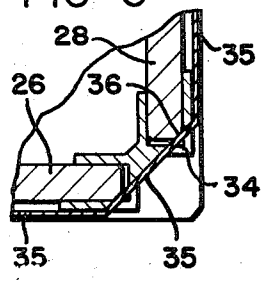


FIG-7

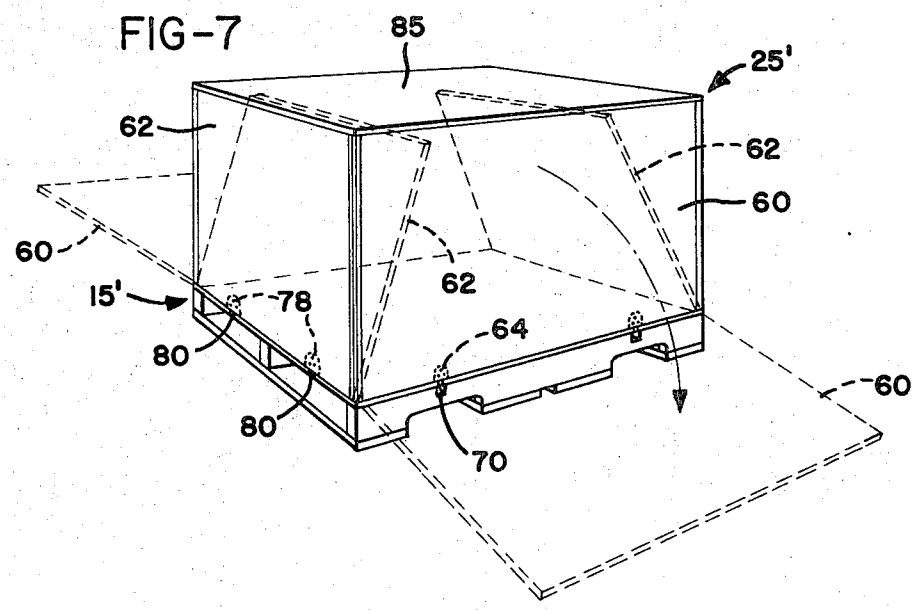


FIG-8

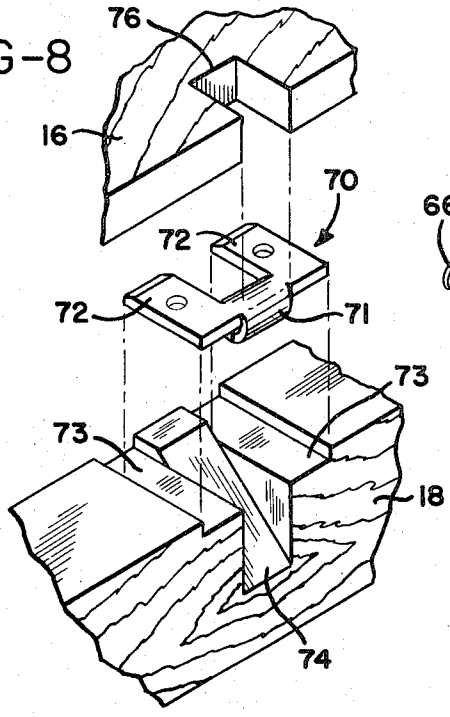


FIG-9

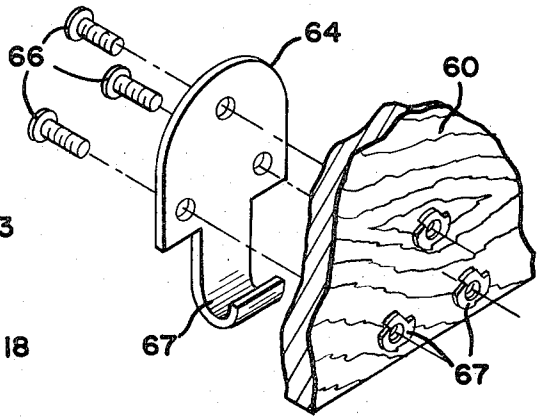


FIG-10

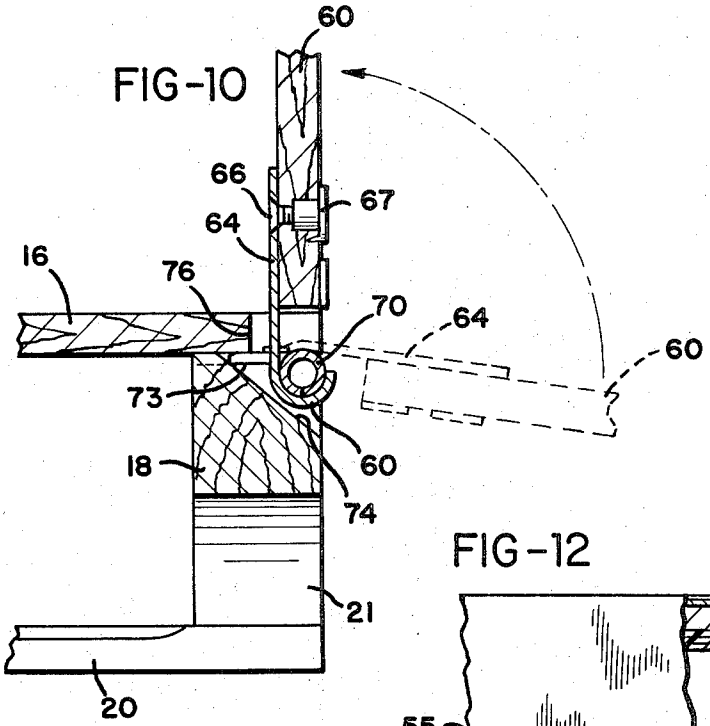


FIG-11

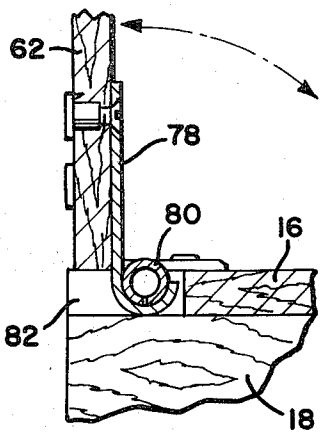
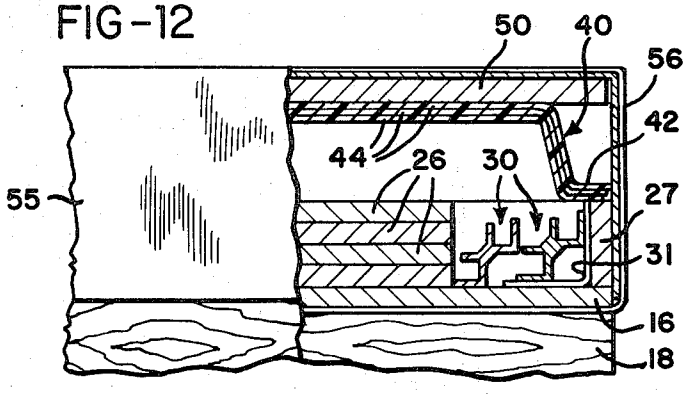


FIG-12



DEMOUNTABLE PALLET AND CONTAINER ASSEMBLY

BACKGROUND OF THE INVENTION

There have been many proposed pallet assemblies including a knock-down or demountable container which is mounted on the upper deck of the pallet for receiving a load of material or articles. Typical such pallet assemblies are shown in U.S. Pat. Nos. 2,775,360, 2,897,995, 3,133,511 and 3,477,604. When the pallet and container assemblies are used for transporting articles, commonly the articles are loosely stacked within the container or individually packaged in boxes which are stacked within the container. To prevent shifting of the articles or boxes within the container, cardboard or wood spacers or other packing material is inserted between the articles and/or between the articles and the side walls of the container. Frequently, this packing operation requires significant time and labor and may result in non-uniform loading of the pallet.

SUMMARY OF THE INVENTION

The present invention is directed to an improved demountable pallet and container assembly which is especially suited for locating a plurality of articles in prearranged stacked relation and for protecting the articles in the event the container assembly is subjected to substantial impact. The container assembly of the invention also provides for convenient loading of articles into the container and for convenient subsequent unloading of the articles from the container. The invention further provides for securing the side and end walls of the container to a pallet in a manner which forms a rigid connection but which may be conveniently and quickly disassembled and arranged in a compact relation for storing of the assembly.

In accordance with one embodiment of the invention, a pallet supports a rectangular container having side and end walls each including a plurality of vertically aligned wall panels. A plurality of tray members are positioned within the container, and each tray member has a peripheral edge portion which projects outwardly between the adjacent edge surfaces of the wall panels. A plurality of recesses or cavities are formed within each tray member, and the depth of the cavity and the height of the wall panels are selected according to the height of the articles to be transported so that the articles are disposed in stacked relation after the wall panels and tray members are assembled. Vertical corner posts secure the side wall panels to the end wall panels and are provided with vertically spaced notches for receiving corresponding locking straps or bands which firmly engage the ends of the wall panels.

In accordance with another embodiment of the invention, side and end wall panels of the container are each secured to the pallet by means of hook members which attach to the wall panels and engage cross pin members secured to the pallet. The side and end wall panels are assembled and disassembled by pivoting the panels between generally horizontal and vertical positions.

Other advantages and features of the invention will be apparent from the following description, the accompanying drawings and the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a pallet and container assembly constructed in accordance with the invention;

FIG. 2 is a view similar to FIG. 1 with portions removed and exploded to illustrate the assembly of the container;

FIG. 3 is a fragmentary section of the pallet and container assembly shown in FIGS. 1 and 2;

FIG. 4 is a fragmentary corner section taken generally on the line 4—4 of FIG. 3;

FIG. 5 is a fragmentary corner section taken generally on the line 5—5 of FIG. 3;

FIG. 6 is a similar fragmentary corner section taken generally on the line 6—6 of FIG. 3;

FIG. 7 is a perspective view of a pallet and container assembly constructed in accordance with another embodiment of the invention and showing, by dotted lines, the container being disassembled;

FIG. 8 is a fragmentary exploded perspective view of the one portion of a wall panel coupling used on the pallet and container assembly shown in FIG. 7;

FIG. 9 is a fragmentary perspective exploded view of another portion of the coupling used on the assembly shown in FIG. 7;

FIG. 10 is a fragmentary vertical section showing the coupling portion of FIG. 9 connected to the coupling portion of FIG. 8;

FIG. 11 is a view similar to FIG. 10 and showing another wall panel coupling used on the container and pallet assembly shown in FIG. 7; and

FIG. 12 is a fragmentary vertical section of the pallet and container shown in FIGS. 1–3 as arranged for storing and shipping without a load of cargo.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the pallet and container assembly shown in FIG. 1, a conventional wood pallet 15 includes a rectangular upper deck 16 commonly formed of plywood, three longitudinally extending spacer legs or rails 18 secured to the underneath surface of the deck 16, and a set of bottom skids or stringers 20 which are secured to the bottom of the rails 18. Recesses 21 are formed within each of the rails 18 and are adapted to receive the projecting tines or forks of a fork-lift truck. The forks of the truck may also be inserted in the space between the upper deck 16 and the stringers 20 to provide for four-way entry of the truck into the pallet.

In accordance with the present invention, a rectangular box-like container 25 is mounted on the upper deck 16 of the pallet 15 and includes a series of vertically aligned end wall panels 26 and 27 and a series of vertically aligned side wall panels 28 and 29. The lower wall panels 27 and 29 are rigidly secured to the upper deck 16 of the pallet 15 by a series of fasteners, such as brackets 31, FIG. 12, or other suitable fastening means.

The end and side wall panels 26–29 are retained in vertical alignment by a set of four corner posts 30 (FIGS. 1, 2 and 4) each including a set of integrally connected channel portions 32 which receive the corresponding end portions of the wall panels. The corner posts 30 may be cut from an extrusion, or separate channel channel portions 32 may be rigidly connected, as for example, by vertically spaced welds. Each of the

corner posts **30** includes a series of vertically spaced notches **34** which are adapted to receive corresponding wrap around steel bands **35** as shown in FIG. **1.** The notches **34** are of sufficient depth that the bands **35** firmly engage and bite into the end corner surfaces **36** of the adjacent wood wall panels so that the panels are rigidly secured to the corner posts.

Referring to FIGS. **2, 3** and **5,** a plurality of rectangular tray members **40** are positioned in vertically spaced relation above the upper deck **16** of the pallet **15,** and each of the tray members **40** includes a peripheral lip portion **42** which projects outwardly between the adjacent edge surfaces of the wall panels **26–28.** Preferably, the tray members **40** are vacuum formed from a thermoplastic sheet material, such as an ABS plastic, and each tray member includes a plurality of uniformly spaced recesses or cavities **44** which are adapted to receive a load of articles **45** to be transported. The size and depth of the cavities **44** is determined according to the size and shape of the articles **45** so that after multiple layers of articles and tray members are assembled along with the wall panels **26–29,** the articles **45** are arranged in stacked relation on the upper deck **16** of the pallet **15** with the tray members **40** sandwiched between the articles. The cavities **44** confine the articles to provide for a uniformly loaded pallet and prevent lateral shifting of the articles **45.**

While the articles **45** are illustrated herein in the form of rectangular boxes, it is to be understood that the articles may be in any form and that the cavities **44** generally conform to the configuration of the articles. As shown in FIG. **5,** a notch or recess **48** is formed within the outwardly projecting peripheral lip portion **42** of each tray member **40** for receiving the corner posts **30.** After the tray members **40,** the articles **45** and the wall panels **26–29** are assembled, a rigid top cover **50** formed of a material such as plywood, is mounted on the upper ends of the corner posts **30** and the upper edges of the wall panels and is secured thereto by one or more surrounding steel bands **52** which extend under the upper deck **16** of the pallet **15.**

Referring to FIG. **12,** the pallet and container assembly shown in FIGS. **1** and **2** may be knocked down or demounted and assembled on the upper deck **16** of the pallet **15.** That is, the wall panels **26** and **28** are stacked on the upper deck **16,** and the corner posts **30** are placed between the stacked wall panels and the bottom wall panels **27** and **29** which are rigidly secured to the upper deck **16.** The height of the panels **27** and **29** is therefore selected to accommodate the depth of the recess in trays **40** (FIG. **3**) and also the thickness of the panels **26** and corner posts **30** (FIG. **12**). The tray members **40** are nested and inverted so that the outwardly projecting peripheral lip portion **42** rests upon the upper edge surfaces of the wall panels **27** and **29.** The top cover **50** may be placed upon the wall panels **26** and **28** or upon the tray members **40,** and the entire assembly may be covered by a cardboard cap **55** secured to the pallet **15** by a surrounding steel band **56.** If desired, the cardboard cap **55** may also be used in place of the wood cover **50** on the erected container shown in FIG. **1** and secured in place by the upper steel band **35.**

Referring to FIGS. **7–11** showing a pallet and container assembly constructed in accordance with another embodiment of the invention, a pallet **15'** supports a container **25'** having opposing side wall panels **60** and opposing end wall panels **62.** A set of hook members **64** (FIGS. **9** and **10**) are mounted on the lower edge portion of each side wall panel **60,** and each hook member is secured by a set of fasteners such as screws **66** and T-nuts **67.** Each hook member **64** is formed of sheet metal and includes a U-shaped portion **68** projects in overlying relation to the lower edge surface of the side wall panel **60.**

Pin members **70** (FIG. **8**) are mounted on the outer rails **18** of the pallet **15'** for the hook members **64,** and each pin member **70** includes a cylindrical pin portion **71** rigidly connecting two flange portions **72.** Recesses **73** are formed within the top surface of the outer rails **18** of the pallet **15** for receiving the flange portions **71** and are spaced on opposite sides of sloping grooves or notches **74** which align with corresponding notches **76** formed within the upper deck **16** of the pallet **15.**

As shown in FIGS. **7** and **10,** the side wall panels **60** are assembled to the pallet **15'** by connecting the U-shaped portions **67** of the hook members **64** to the corresponding pin portions **71** of the pin members **70** when the side wall panels **60** are located in generally horizontal positions. The side wall panels **60** are then pivoted to upright positions causing the lower edge surfaces of the side wall panels to engage the top surface of the deck **16** of the pallet **15** so that the side wall panels **60** are firmly locked to the pallet **15'.**

The end wall panels **62** are connected to the ends of the pallet **15'** in a manner similar to that of the side wall panels **60.** That is, a set of hook members **78** (FIG. **11**) are bolted to the lower edge portion of each end wall panel **62.** Each hook member **78** includes a U-shaped portion **79** which projects away from the end surface of the wall panel for engaging a pin member **80** secured to the upper deck **16'** of the pallet **15'** within a corresponding notch **82.** The end wall panels **62** are assembled to the pallet **15'** by positioning each end wall panel generally horizontally in overlying relation to the pallet deck and then uprighting the end wall panels after the U-shaped hook portions **79** are seated on the pin members **80.** After the side and end wall panels **60** and **62** are assembled, a set of corner posts **30** (not shown in FIG. **7**) are inserted onto the adjacent end portions of the wall panels. Strapping bands are extended around the wall panels and over a top rigid cover **85** in the same manner as described above in connection with the pallet and container assembly shown in FIGS. **1** and **2.**

From the drawings and the above description, it is apparent that a pallet and container assembly constructed in accordance with the present invention provides desirable features and advantages. For example, the tray members **40** cooperate with the end and side wall panels **26–29** to provide for positively locating and confining a load of articles within the container **25.** Furthermore, the side and end wall panels and the tray members may be conveniently and quickly assembled and disassembled and, as shown in FIG. **12,** may be arranged in a compact manner to provide for transporting the pallet and container when demounted. The corner posts **30** and the steel wrapping band **35** cooperate to provide another important feature. That is, the bands **35** extend through the notches **34** which not only prevent the bands from shifting but also enables the bands to engage and bite into the end surfaces **36** of the wall panels (FIG. **6**). The lower band **35** therefore locks the corner posts **30** to the lower end and side wall

panels and the upper steel bands lock the upper end and side wall panels to the corner posts.

The embodiment shown in FIGS. **7–11** provides for a simplified but rigid connection between the side and end wall panels of the container and the pallet. That is, the hook members **64** and **78** cooperate with the pin members **70** and **80** to form simple and economical but rigid and positive releasable couplings between the pallet and the side and end walls of the container.

While the forms of apparatus herein described constitute preferred embodiments of the invention, it is to be understood that the invention is not limited to these precise forms of apparatus, and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. A demountable pallet and container assembly comprising a generally rectangular rigid pallet having a deck forming a load supporting surface and means defining laterally extending passages adapted to receive a fork-lift truck, a set of opposite vertical side walls and opposite vertical end walls, each of said walls including a series of vertically aligned wall panels, at least one generally rectangular tray member overlying said deck surface and including a lip portion along at least one edge, said lip portion projecting outwardly between a set of adjacent said wall panels, and means for securing said wall panels to said pallet, said securing means comprising a plurality of corner posts each engaging the corresponding adjacent edges of said wall panels, and means defining at least one notch within each said corner post for receiving a band wrapped around said wall panels and corner posts.

2. A pallet and container assembly as defined in claim **1** wherein said tray member has a peripheral said lip portion projecting between adjacent said wall panels of both said side walls and both said end walls.

3. A pallet and container assembly as defined in claim **1** including a plurality of said tray members arranged in vertically spaced relation, means defining a plurality of cavities within each said tray member for locating and retaining articles to be transported, and the depth of said cavities and the height of said wall panels being correlated to provide for stacking of the articles on said deck surface of said pallet with said tray members disposed between the stacked articles.

4. A pallet and container assembly as defined in claim **1** wherein the lowermost said side wall and end wall panels are rigidly secured to said deck of said pallet.

* * * * *