Dec. 20, 1960 M. E. FOSTER 2,965,276

PALLET CONTAINER

Filed April 24, 1957 5 Sheets-Sheet 1

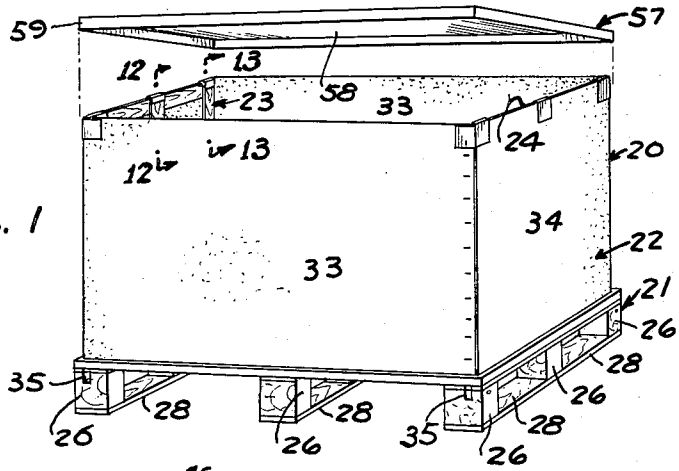
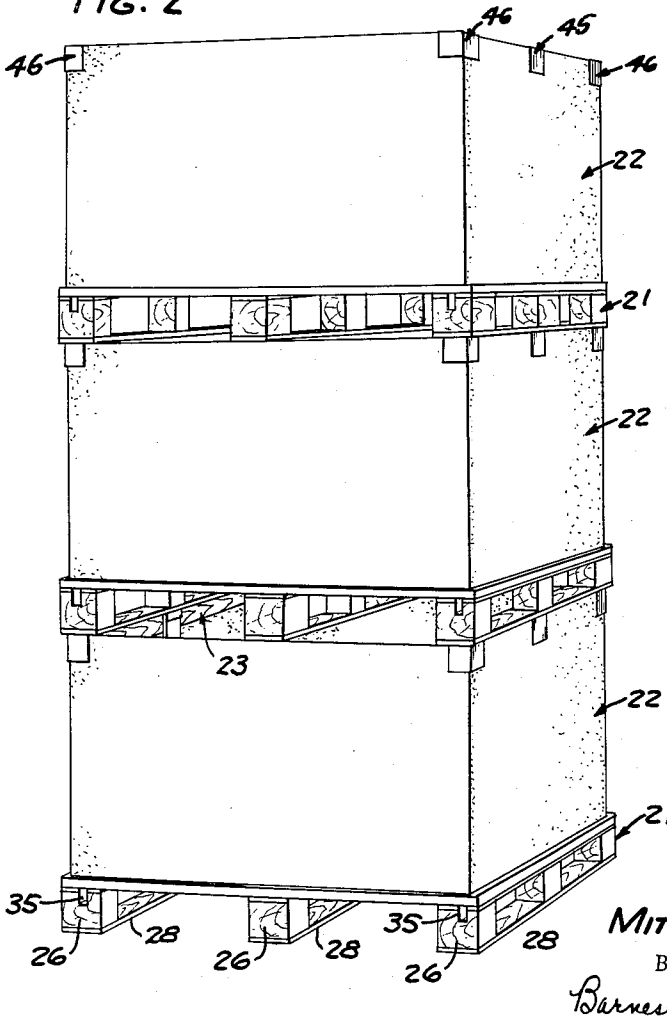


FIG. 1

FIG. 2



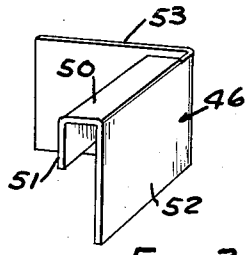


FIG. 3

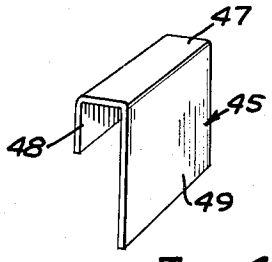


FIG. 4

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PALLET CONTAINER

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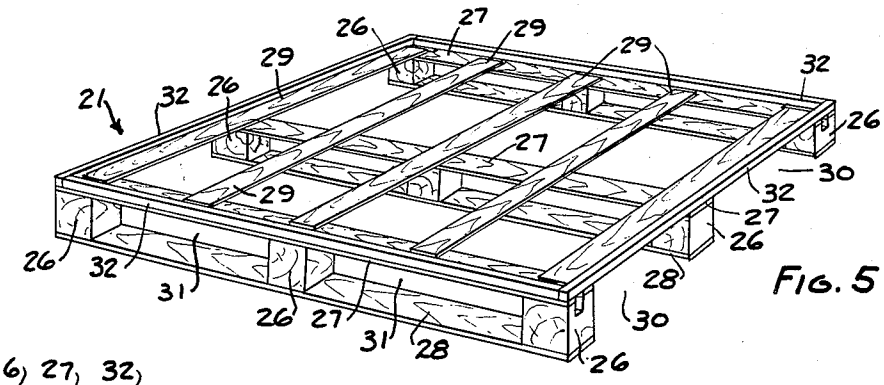


FIG. 5

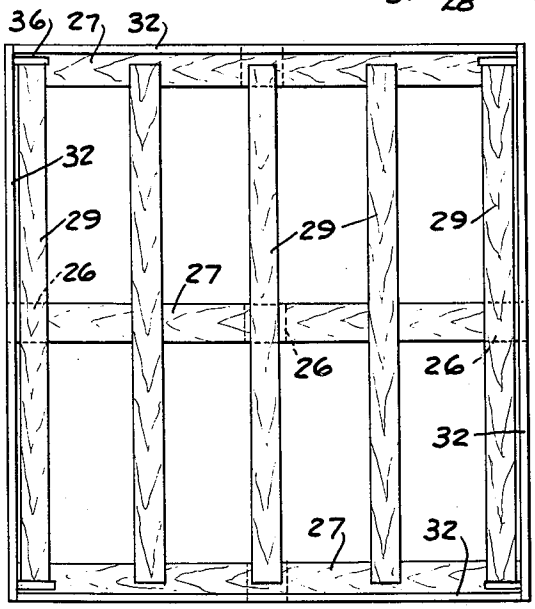


FIG. 6

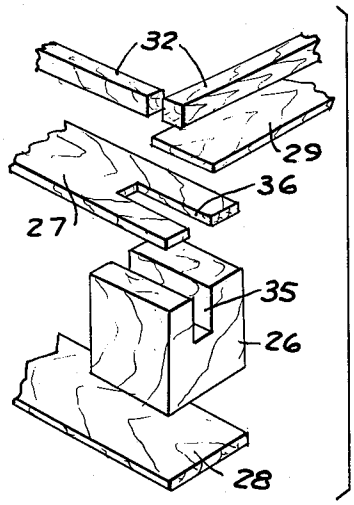


FIG. 7

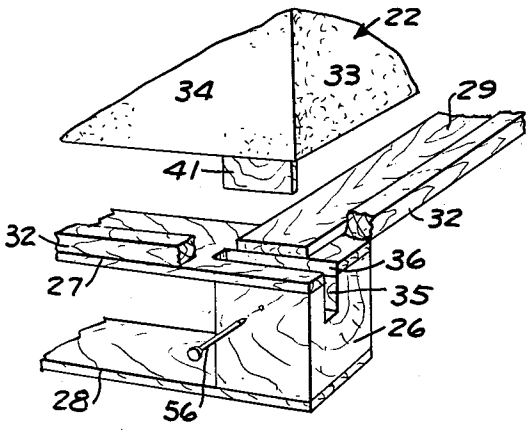


FIG. 8

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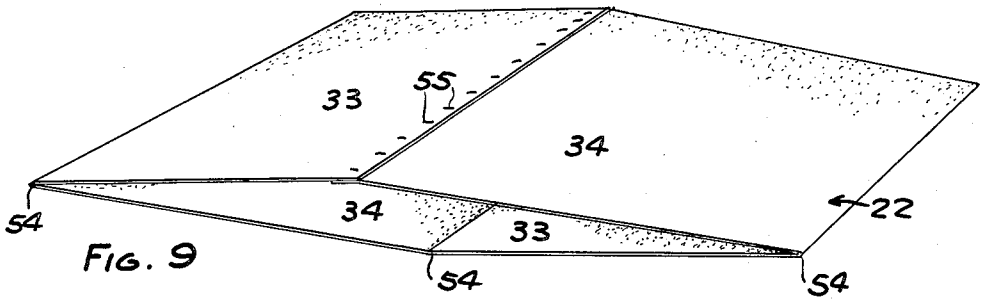


FIG. 9

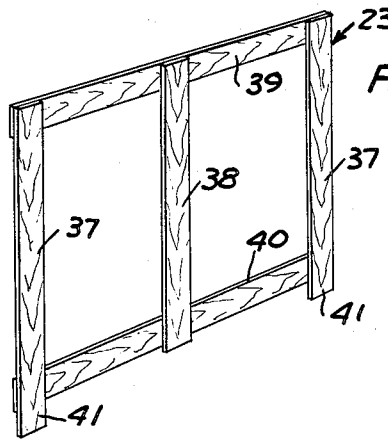


FIG. 10

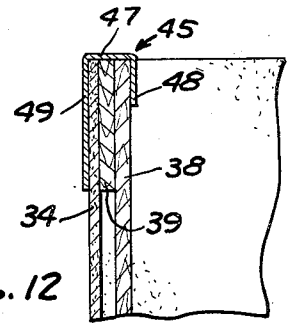


FIG. 12

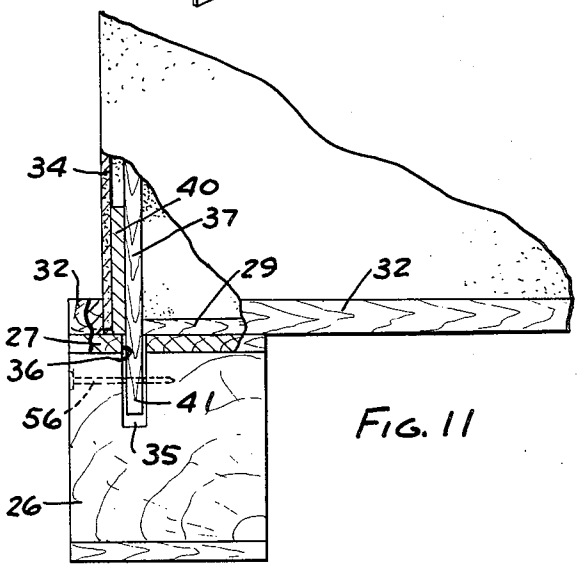


FIG. 11

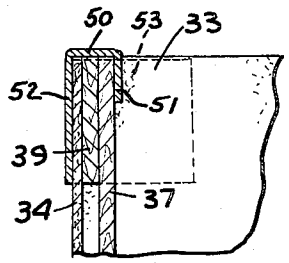


FIG. 13

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PALLET CONTAINER

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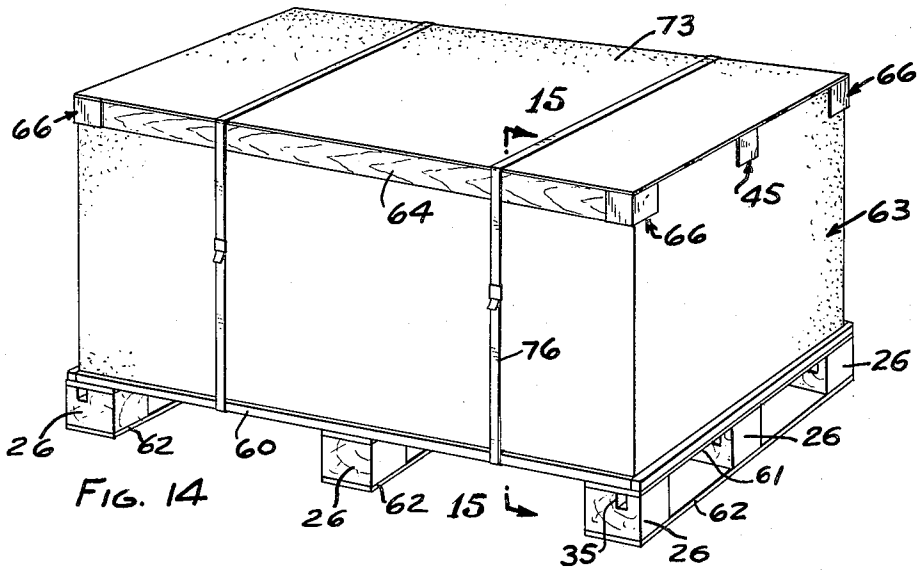


FIG. 14

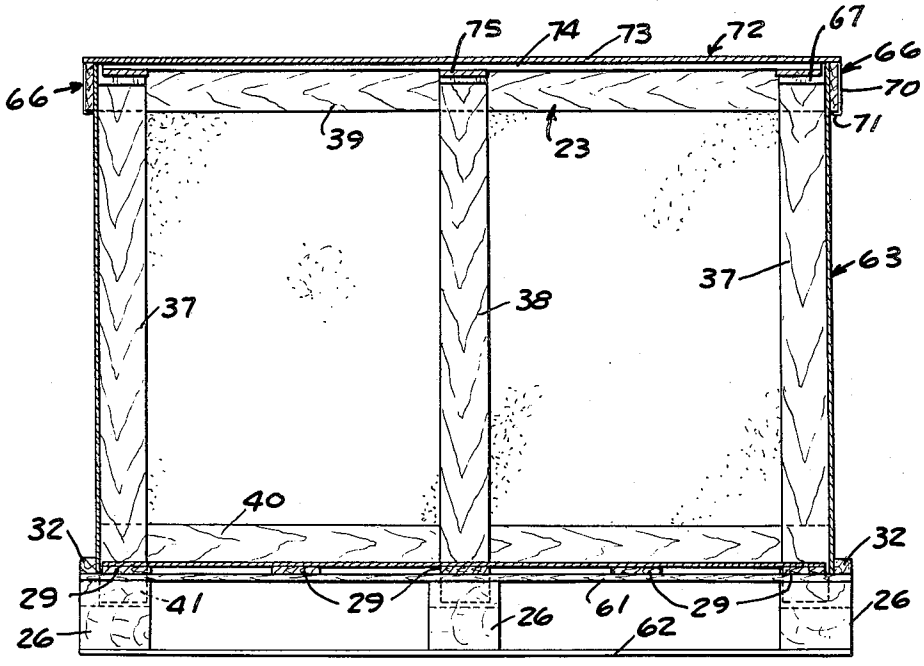


FIG. 15

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PALLET CONTAINER

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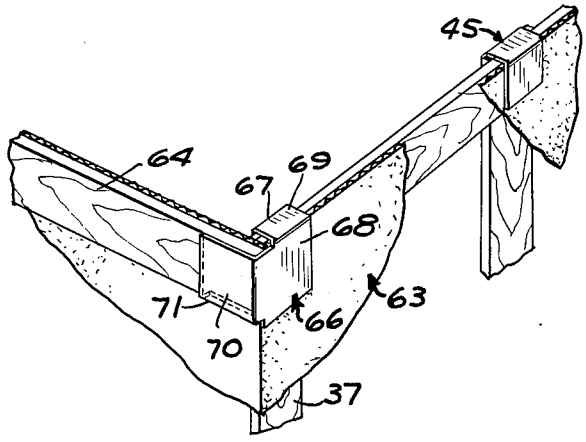


FIG. 16

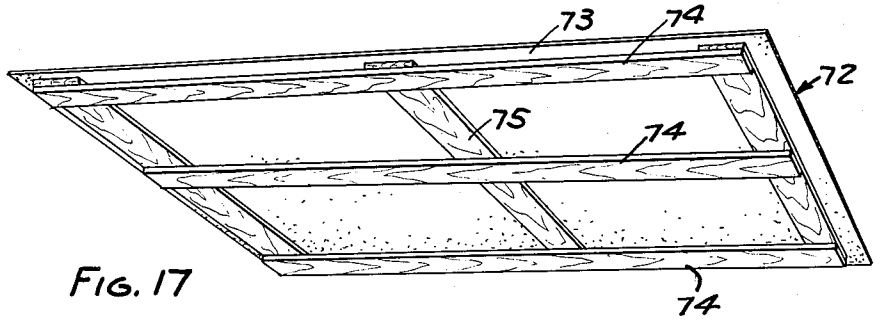


FIG. 17

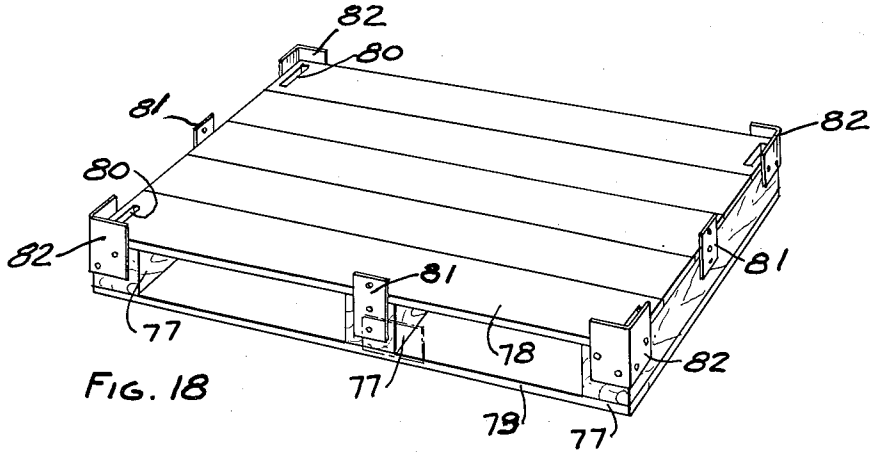


FIG. 18

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United States Patent Office

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Patented Dec. 20, 1960

2,965,276

PALLET CONTAINER

Mitchell Eli Foster, Detroit, Mich., assignor to Packing Material Company, Inc., Detroit, Mich., a corporation of Michigan

Filed Apr. 24, 1957, Ser. No. 654,759

8 Claims. (Cl. 229—23)

This invention relates to pallet containers and particularly to pallet containers of the type which can be readily assembled and disassembled and stacked vertically one on another.

In the handling of loads for transports or storage it is desirable to be able to readily move the load. In order to facilitate such movement pallets have been used which provide a generally flat deck on which the load is supported and means for supporting the deck in vertically spaced relationship to the ground to enable the tines of a fork-lift truck to enter below the deck for moving the pallet. Because certain types of loads cannot be readily supported on an open pallet, containers have been used in connection with the pallet to form a pallet-type container.

It is desirable that the pallet-type container be light in weight and be sufficiently strong to permit one container to be stacked on another. In addition, the pallet container should have a great corner strength and be highly resistant to bulging. The pallet container should be low in cost and preferably should be readily assembled and disassembled for return and reuse.

One type of pallet container which has been used comprises a corrugated box banded or glued to a wooden pallet. Such a corrugated box container has the disadvantage in that it does not have sufficient strength to permit stacking of one pallet container on the other for shipment or storage. Some efforts have been made to provide special liners for the corrugated pallet container or to use special corrugated board in order to improve the stacking qualities but these have not proved successful and, in addition, have greatly increased the cost of the corrugated pallet container. Another disadvantage of the corrugated pallet container is that it does not have sufficient corner strength and there is a tendency for the corners to tear under heavy stress. A further disadvantage of the corrugated pallet container is the tendency to bulge when subjected to heavy loads.

Another type of pallet container which has been used comprises thin sheets of wood veneer reinforced with horizontal cleats nailed or otherwise fastened to a wooden pallet and strips of wire extending horizontally about the periphery of the veneer with their ends hooked together. Such a wire-bound pallet container has the disadvantage of being heavy and cumbersome. In addition, it is difficult to assemble, requiring the work of several workmen. The wire-bound pallet container has limited stacking strength because its strength is due solely to the strength of the veneer. In addition, the wire-bound pallet container is relatively expensive.

Another type of pallet container which has been used comprises four wooden panels nailed to a wooden pallet and held together by horizontally extending steel banding. Such a wooden pallet-type container is fairly difficult to assemble, since each panel must be placed in position and nailed to the pallet. The use of the steel banding is essential in order to provide any degree of strength. The assembly problems are further complicated in case the lumber has warped. In addition, in this wooden

pallet container weaknesses are created during assembly due to nailing failures and splits in the wood. The wooden pallet container is quite heavy. It cannot be readily disassembled for return to the source for reusing and its cost is relatively high.

Another type of pallet container which has been used comprises the use of corrugated sides on a wooden pallet combined with vertical pieces of wood fastened to the corrugated sides and acting as stiffeners. The wooden pieces may or may not be nailed to the outside of the pallet. Such a container has limited strength and a top is necessary in order to provide sufficient rigidity for stacking.

It is therefore an object of this invention to provide an improved pallet container which has good stacking qualities.

It is a further object of this invention to provide such a pallet container which has good corner strength.

It is a further object of this invention to provide such a pallet container which has a high resistance to bulging.

It is a further object of this invention to provide such a pallet container which is light in weight.

It is a further object of this invention to provide such a pallet container which can be readily assembled and disassembled by one workman.

It is a further object of this invention to provide such a pallet container wherein the component parts can be shipped or stored separately and quickly assembled to form the container.

In the drawings:

Fig. 1 is a perspective view of a pallet container embodying the invention.

Fig. 2 is a perspective view of a plurality of pallet containers embodying the invention and positioned in vertically stacked relationship.

Fig. 3 is a perspective view on an enlarged scale of a metal corner bracket utilized in the invention.

Fig. 4 is a perspective view on an enlarged scale of a metal side bracket utilized in the invention.

Fig. 5 is a perspective side view of the pallet utilized in the pallet container shown in Fig. 1.

Fig. 6 is a plan view of the pallet shown in Fig. 5.

Fig. 7 is an exploded fragmentary perspective view on an enlarged scale of the lower right-hand corner of the pallet shown in Fig. 6.

Fig. 8 is a fragmentary perspective view on an enlarged scale of the lower left-hand corner of the pallet container shown in Fig. 1 in partly assembled relationship, portions being broken away.

Fig. 9 is a perspective view of a tube used in the pallet container shown in Fig. 1, the tube being in a generally collapsed condition.

Fig. 10 is a perspective view of a vertical frame used in the pallet container shown in Fig. 1.

Fig. 11 is a fragmentary side elevational view on an enlarged scale of the lower left-hand corner of the pallet container shown in Fig. 1, portions being broken away.

Fig. 12 is a fragmentary sectional view on an enlarged scale taken along the line 12—12 in Fig. 1.

Fig. 13 is a fragmentary sectional view on an enlarged scale taken along the line 13—13 in Fig. 1.

Fig. 14 is a perspective view of a modified form of pallet container.

Fig. 15 is a sectional view on an enlarged scale taken along the line 15—15 in Fig. 14.

Fig. 16 is a fragmentary perspective view on an enlarged scale of an upper corner of the pallet container shown in Fig. 14, portions being broken away.

Fig. 17 is a perspective view of a cover used in the pallet container shown in Fig. 14.

Fig. 18 is a perspective view of a modified form of pallet which may be used in making the pallet container.

Referring to Fig. 1, pallet container 20 comprises a pallet 21, a tube 22 and diametrically opposed vertical panels or frames 23, 24 positioned to contact the interior surfaces of tube 22.

As shown in Figs. 5 and 6, pallet 21 comprises horizontally spaced blocks 26 connected by vertically spaced stringers 27, 28. Deck boards 29 extend transversely over upper stringers 27 and connect the stringers to form the pallet. By this construction, deck boards 29 provide a substantially horizontal deck onto which loads may be placed and blocks 26 and stringers 27, 28 space the deck vertically above ground to permit the tines of a fork-lift truck to be inserted into spaces 30 or 31 for lifting and moving the pallet. The use of bottom stringers 28 is optional.

Rim cleats 32 extend horizontally around the periphery of pallet 21. As shown in Figs. 1 and 2, tube 22 is rectangular in shape and comprises diametrically opposed pairs of vertically extending sides 33, 34. The lower ends of sides 33, 34 project within rim cleats 32 with a close fit (Fig. 11) and rest on stringers 27 so that rim cleats 32 contact a portion of the lower outer surface of tube 22 to tend to limit the outward movement of tube 22 relative to the pallet. As shown in Fig. 9, tube 22 has both ends open and may be collapsed to bring sides 33, 34 into flat relationship for shipment and storage.

As shown in Figs. 1 and 2, blocks 26, at the corners of the pallet container, are provided with slots 35 extending parallel to stringers 27, 28. As shown in Figs. 7 and 8, the two end stringers 27 are provided with corresponding slots 36 in overlying relationship to slots 35. As further shown in Figs. 7 and 8, the deck boards 29 at the ends of the pallet are of such a length that they terminate adjacent the slots 36, 35 and are spaced slightly from the adjacent rim cleats 32 so as to accommodate the lower edges of sides 33 of tube 22 (Fig. 6).

Referring to Fig. 10, frames 23, 24 comprise vertically extending cleats 37, 38 connected by horizontal top and bottom cleats 39, 40, respectively. The endmost vertical cleats 37 have the lower portions 41 thereof extending vertically downwardly below the lower horizontal cleat 40. These portions 41 extend into slots 36, 35 to support frame 23 on pallet 21 (Fig. 11). Frames 23, 24 are positioned within tube 22 with the horizontal cleats 39, 40 adjacent the inner surface of tube 22 (Figs. 1 and 11).

As shown in Fig. 6, the ends of the deck boards 29 terminate in a straight line spaced inwardly of rim cleats 32 a distance generally equal to the thickness of cleats 37 and 40 of the panels 34. Thus, when the pallet container is assembled the lower edges of tube 22 are firmly clamped between rim cleats 32 and deck boards 29 or the horizontal cleats 40 of frames 23, 24. As shown in Fig. 11, the depth of slot 35 is greater than the vertical dimension of portion 41 so that the lower horizontal cleats 40 can seat solidly on the upper surface of stringers 27.

Means are provided for fastening the upper end of tube 22 to the upper end of frames 23, 24 and comprises side clip 45 and corner clips 46, preferably made of metal. As shown in Figs. 4 and 12, clip 45 comprises an inverted U-shaped portion having a base 47, short leg 48, and long leg 49. Clip 45 is placed over the upper end of vertical cleats 38 with the short leg contacting the inner surface of cleat 38 and the long leg extending downwardly against a portion of the outer surface of side 34 of tube 22. The base of clip 45 contacts the upper end of side 34, upper horizontal cleat 39, and vertical cleat 38. Corner clip 46 also includes an inverted U-shaped portion having a base 50, short leg 51 and long leg 52. Long leg 52 extends beyond the edge of base 50 and a projection 53 extends away from long leg 52 at right angles. Clip 46 is positioned at the upper corner, as shown in Figs. 1 and 13, with short leg 51 contacting the inner surface of vertical cleat 37 and long leg 52 contacting a portion of the outer surface of side 34. Base 50 contacts the upper end of side 34, horizontal cleat 39 and vertical cleat 37. Projection 53 wraps around the corner of the tube contacting a corner portion of the outer surface of side 33 and clamping this corner portion against the end portions of cleats 37 and 39. It should be understood that the clips at the other upper corners of tube 22 are of similar and complementary construction.

In manufacturing pallet containers of this invention the pallet 21 is assembled by fastening the parts thereof together, preferably by nailing or stapling. Tube 22 is formed from a sheet of suitable material by folding along scored lines 54 (Fig. 9) and fastening the ends thereof by staples 55 or other means such as stitching or gluing. Frames 23, 24 are made by fastening horizontal cleats 39, 40 to vertical cleats 37, 38 by suitable means such as nailing.

The pallet 21, tube 22 and frames 23, 24 may be shipped in compact form to the user. After receipt by the user, they may be stored in the same compact form until their use is required. These components may then be assembled, as presently described, and used for storage or shipment. When the pallet container is no longer needed, the components may be disassembled and stored once again until further needed or returned to the source in disassembled condition.

In order to assemble the components a workman places the pallet 21 on a flat surface. Tube 22 is then expanded and placed on the pallet with the open ends thereof extending upwardly and downwardly. In this connection, although tube 22 is illustrated as a one-piece unit with its ends stitched as at 55, it may also be formed as two similar pieces each with a score line 54. The lower end portions of tube 22, either the one-piece unit or the two-piece unit, are inserted within rim cleats 32 (Fig. 11). Frames 23, 24 are then placed within tube 22 with horizontal cleats 39, 40 adjacent the inner surfaces of sides 34 and the portions 41 of frames 23, 24 are inserted in slots 36, 35. Each frame is pushed downwardly to bring lower horizontal cleat 40 into abutting contact with upper stringer 27. This causes the lower edges of sides 34 of tube 22 to be clamped between cleats 40 and the adjacent rim cleats 32. The lower corners of sides 33 are thus also clamped between the adjacent rim cleats 32 and the coplanar side edges and end edges of cleats 37 and 40, respectively. At this point, a pin, lag screw or nail 56 may be driven through block 26 and portion 41 to securely fasten portion 41 in block 26, as shown in Fig. 11. Clips 45, 46 are then slipped over the upper ends of the tube and frame and the assembly of the pallet container is thereby completed.

The resultant pallet container has sufficient strength to withstand the stresses involved in moving and storing heavy loads. In addition, the pallet containers may be stacked vertically without the use of covers and, at the same time, without any danger of bulging or crushing. The corners are sufficiently strong so that there is no tendency to tear under heavy stress.

In my opinion, a major factor in obtaining the high stacking strength is the use of the vertical cleats 37, 38, These vertical cleats support the weight of one pallet container which is placed on top of another. The bottom horizontal cleat 40 of each frame 23, 24 also adds to the stacking properties by its resting solidly against stringer 27 thereby assisting in supporting the load. The clips 45, 46 which lock the tube 22 to the frames 23, 24 make the unit more rigid and provide a solid support for stacking purposes. It should be understood that additional vertical cleats may be added as required. In addition, all or any number of the vertical cleats may be extended into complementary slots in the pallet.

A major factor in preventing bulging is the cooperative action of rim cleats 32 with the horizontal cleats 40 of frames 23, 24 in preventing the inward and outward move-

ment of the lower end of tube 22. The clips 45, 46 and horizontal cleats 39 of frames 23, 24 hold the upper end of the tube 22 and prevent bulging inwardly or outwardly of the upper end. If further resistance to inward bulging is required, additional horizontal cleats may be provided. The metal corner clips 46 provide corner strength for the pallet container.

I have found that in most instances a satisfactory pallet container is obtained by using frames 23 in diametrically opposed relationship on opposite sides only of the pallet and tube. Where additional stacking strength is required, additional frames may be added on the other sides of the pallet and tube.

It can be seen that the pallet container can be readily disassembled and assembled by one workman without the use of nails, staples or glue. The cost of each pallet container is quite low.

If the nature of the load is such that it must be protected, a cover 57 may be placed over the upper end of the pallet container, as shown in Fig. 1. Cover 57 may be made in any desired form, preferably of a lightweight material such as is used for making tube 22. The cover shown comprises a flat top portion 58 which rests on the upper end of the pallet container and a downwardly projecting peripheral portion 59 adapted to contact the outer surface of the upper end of the pallet container. Obviously, covers reinforced with cleats may also be used.

Tube 22 may be made of a lightweight fibrous material such as corrugated paper board, fiber board or ply veneer, the latter being a thin sheet of plywood having a sheet of waterproof paper glued to one surface thereof. Ply veneer is preferred where additional strength is required and where the pallet container is to be stored outdoors. As pointed out previously, if desired tube 22 may be made of several pieces of scored material and the pieces need not be stitched or otherwise fastened together, since the lower ends thereof are securely held between rim cleats 32 and frames 23, 24 and the upper ends thereof are secured to frames 23, 24 by clips 45, 46.

In the form of pallet container shown in Figs. 14–17 the length of deck boards 60 is greater than the length of stringers 61, 62. In this construction, the frames 23, 24 are positioned along the short sides of the pallet and contact with the shorter sides of tubes 63. Positioning of frames 23, 24 at the short ends of the pallet when feasible is desired because of the use of smaller frames reducing the weight and the cost of the unit. In this type of arrangement, or even when the frames are arranged along the longer sides of the pallet, if there is a tendency for the sides of the tubes that are not directly adjacent the frames to bulge, these sides may be reinforced by a horizontally extending cleat such as shown at 64.

Cleat 64 is positioned adjacent the outer surface of the long side 65 of the tube 63. When a cleat such as shown at 64 is utilized, a modified form of corner clip 66 is used. Clip 66 includes a U-shaped portion having a short leg 67, long leg 68 and base 69 and, in addition, a right-angle projection 70. Right-angle projection 70 is provided with an inwardly extending lip 71 along its lower edge. In position corner clip 66 has short leg 67 in contact with the inner surface of vertical cleat 37 and long leg 68 in contact with a portion of the outer surface of tube 63. Base 69 contacts the upper end of vertical cleat 37, horizontal cleat 39 and tube 63. Projection 70 contacts the outer surface of additional horizontal cleat 64 while lip 71 extends beneath cleat 64 and supports the cleat 64. This form of the invention provides longitudinal strengthening so that a reinforcement is provided to all sides of tube 63. This form is otherwise identical with the form shown in Figs. 1–13.

As shown in Fig. 17, a modified form of cover 72 may be used with either form of the invention and comprises a flat sheet 73 made of a fibrous material such as that used for tube 22 or tube 63 and spaced longitudinal slats 74 and transverse slats 75 fastened to one surface of sheet 73. As shown in Figs. 14 and 15, cover 72 may be placed over the upper end of the pallet container with the edges of sheet 73 which project beyond the periphery of the frame formed by slats 74, 75 contacting the upper end of the pallet container. Steel banding 76 may then be fastened around the pallet container extending transversely, as shown in Fig. 14. The reinforced top 72 is particularly usable in instances where the container is used for bulky material which results in void spaces in the container. Under such circumstances there might be a tendency for the sides of the container to collapse inwardly. However, a reinforced top such as shown at 72 provides such an arrangement with sufficient rigidity to withstand tight banding.

A modified form of pallet is shown in Fig. 18 and comprises longitudinally extending members 77 connected by vertically spaced stringers 78, 79 to form a flat imperforate deck. Slots 80 are provided at the corners of the pallet to serve the same function as in the previous forms of the invention. Vertically extending flat plates 81 and corner plates 82 are fastened to block 77 and extend upwardly to serve as the means for limiting the outward movement of tube 22 in place of rim cleats.

I claim:

1. A pallet container comprising a horizontal deck, means adapted to contact the ground for maintaining said deck in vertically spaced relationship to the ground, said means providing horizontally extending spaces beneath said deck into which the tines of a fork-lift truck can be inserted for lifting and moving the pallet container, a vertically extending open-ended tube of fibrous material positioned on said deck, rigid means mounted in fixed position on and around the periphery of said deck and forming stationary cleats contacting a portion of the lower outer surface of said tube and thereby limiting any tendency of said lower portion of the tube to move outwardly beyond the periphery of said deck, a pair of rigid vertically extending frames separate from said tube and positioned within said tube in diametrically opposed relationship, each said frame engaging a portion of the interior surface of said tube and clamping said portion against said last mentioned rigid means, interengaging means between the lower end of each said frame and said deck for supporting said frame in position, each said frame comprising horizontally spaced vertically extending cleats and vertically spaced horizontally extending cleats fastened to and connecting said vertical cleats, at least some of said vertical cleats extending downwardly beyond the lowermost horizontal cleat, said interengaging means comprising said portions of said vertical cleats which extend downwardly below said horizontal cleat and complementary slots in said deck into which said portions extend, said slots being spaced from the periphery of said deck, the depth of said slots being greater than the length of said portions of said vertical cleats which extend downwardly beyond said lowermost horizontal cleat whereby said lowermost horizontal cleat abuts said deck, and means for disengageably connecting the upper portion of said tube to each said frame whereby said pallet container may be assembled by placing said tube on said deck with said rigid means locating said tube on said deck, and inserting said frames downwardly within said tube to impart rigidity to portions of said tube and to clamp portions of said tube against said rigid means.

2. The combination set forth in claim 1 wherein said means for contacting the lower portion of the outer surface of said tube comprises rim cleats mounted on said deck and extending along the periphery of said deck and engaging the lower surface of said tube.

3. The combination set forth in claim 1 wherein said means for contacting the lower portion of the outer surface of said tube comprises horizontally spaced metal plates extending vertically upwardly from the periphery of said deck and contacting the outer surface of said tube.

4. The combination set forth in claim 1 wherein said deck comprises a plurality of horizontally spaced parallel deck boards extending longitudinally and a plurality of horizontally spaced parallel deck boards extending transversely, said slots extending longitudinally through said longitudinally extending deck boards, said horizontal cleats of said frame being positioned adjacent and in contact with the interior surface of the tube, at least some of said transversely extending deck boards having the ends thereof terminating adjacent said slots.

5. The combination set forth in claim 1 including a pair of horizontally disposed cleats extending along the outer surface of each of the upper edges of the other two sides of said tube, and means clamping a portion of said tube between the inner face of each said last mentioned horizontal cleat and the adjacent end of the adjacent frame.

6. The combination set forth in claim 1 wherein said deck comprises a plurality of horizontally spaced parallel deck boards extending longitudinally and a plurality of horizontally spaced parallel deck boards extending transversely, said slots extending longitudinally through said longitudinally extending deck boards, said horizontal cleats of said frame being positioned adjacent and in contact with the interior surface of the tube, at least some of said transversely extending deck boards having the ends thereof terminating adjacent said slots, said means for contacting the lower portion of the outer surface of said tube comprising rim cleats mounted on said deck and extending along the periphery of said deck.

7. A pallet container comprising a horizontal deck means adapted to contact the ground for maintaining said deck in vertically spaced relationship to the ground, said means providing horizontally extending spaces beneath said deck into which the tines of a fork-lift truck can be inserted for lifting and moving the pallet container, a vertically extending open-ended tube of fibrous material positioned on said deck, rigid means mounted in fixed position on and around the periphery of said deck and forming stationary cleats contacting a portion of the lower outer surface of said tube and thereby limiting any tendency of said lower portion of the tube to move outwardly beyond the periphery of said deck, a pair of rigid vertically extending frames separate from said tube and positioned within said tube in diametrically opposed relationship, each said frame engaging a portion of the interior surface of said tube and clamping said portion against said last mentioned rigid means, interengaging means between the lower end of each said frame and said deck for supporting said frame in position, each said frame comprising horizontally spaced vertically extending cleats and vertically spaced horizontally extending cleats fastened to and connecting said vertical cleats, at least some of said vertical cleats extending downwardly beyond the lower most horizontal cleat, said interengaging means comprising said portions of said vertical cleats which extend downwardly below said horizontal cleat and complementary slots in said deck into which said

portions extend, said slots being spaced from the periphery of said deck, the depth of said slots being greater than the length of said portions of said vertical cleats which extend downwardly beyond said lowermost horizontal cleat whereby said lowermost horizontal cleat abuts said deck, whereby said pallet container may be assembled by placing said tube on said deck with said rigid means locating said tube on said deck, and inserting said frames downwardly within said tube to impart rigidity to portions of said tube and to clamp portions of said tube against said rigid means.

8. A pallet container comprising a horizontal rectangular deck, means adapted to contact the ground for maintaining said deck in vertically spaced relationship to the ground, said means providing horizontally extending spaces beneath said deck into which the tines of a fork-lift truck can be inserted for lifting and moving the pallet container, a vertically extending open-ended rectangular tube of fibrous material positioned on said deck, rigid means mounted in fixed position on and around the periphery of said deck contacting a portion of the lower outer surface of said tube and thereby limiting any tendency of said lower portion of the tube to move outwardly beyond the periphery of said deck, a pair of rigid vertically extending frames separate from said tube and positioned within said tube in diametrically opposed relationship, each said frame engaging a portion of the interior surface of said tube, each said frame having a lower horizontal rail, said deck being formed with vertical slots along opposite sides thereof and spaced from the periphery of said deck, each said frame being formed with complementary downwardly extending projections engaging said slots, the depth of said slots being greater than the length of said projections whereby said lower horizontal rail of said frame abuts said deck, whereby said pallet container is assembled by positioning said tube on said deck with said rigid means on said deck locating said tube thereon, and inserting said frames downwardly within said tube to bring said projections on said frames into engagement with said slots and thereby impart rigidity to portions of said tube and clamp portions of said tube against said rigid means on said deck.

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