Sept. 17, 1963 D. D. EBERLY 3,104,024

COLLAPSIBLE PALLET BOX

Filed June 26, 1961 4 Sheets-Sheet 1

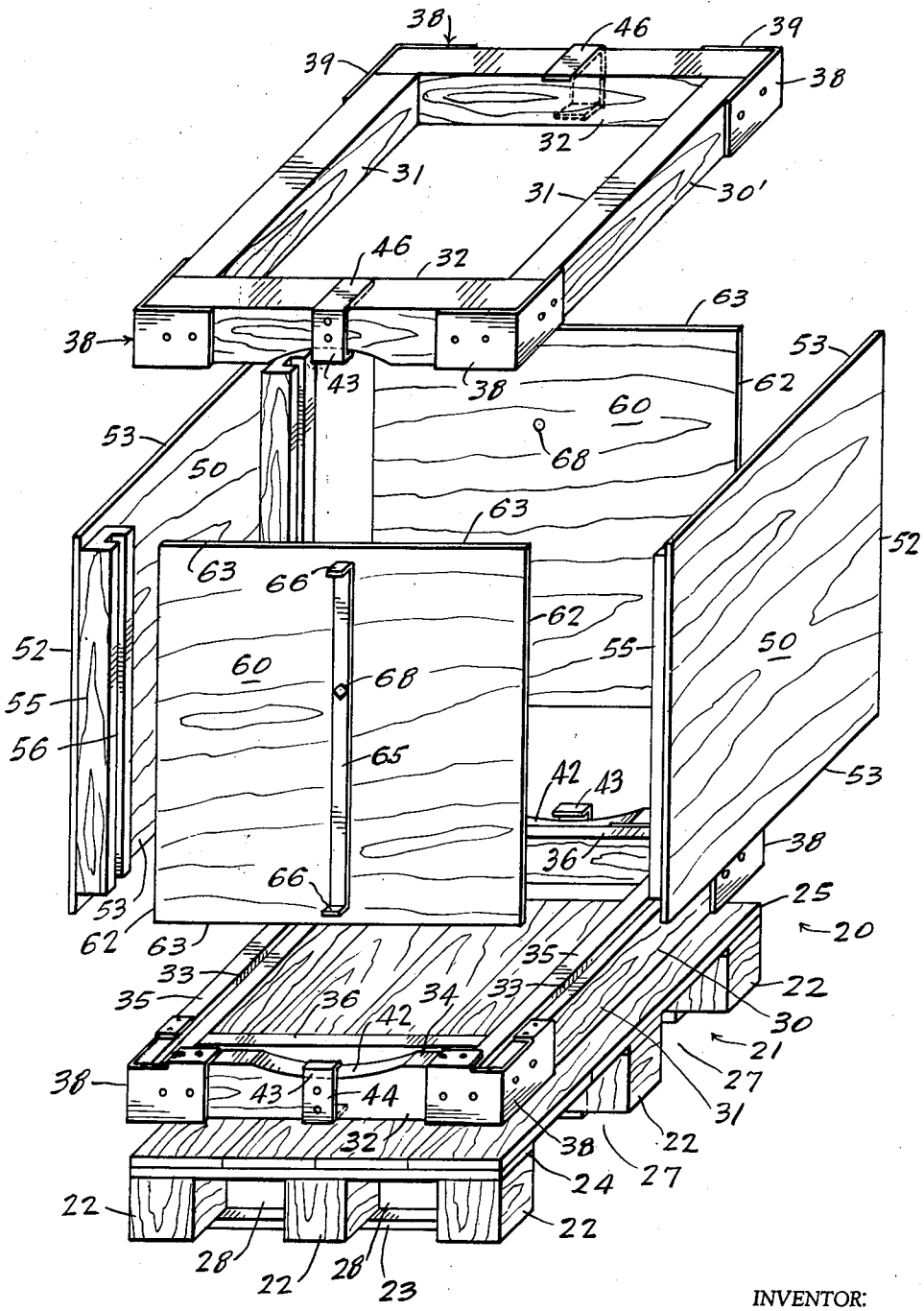


FIG-1-

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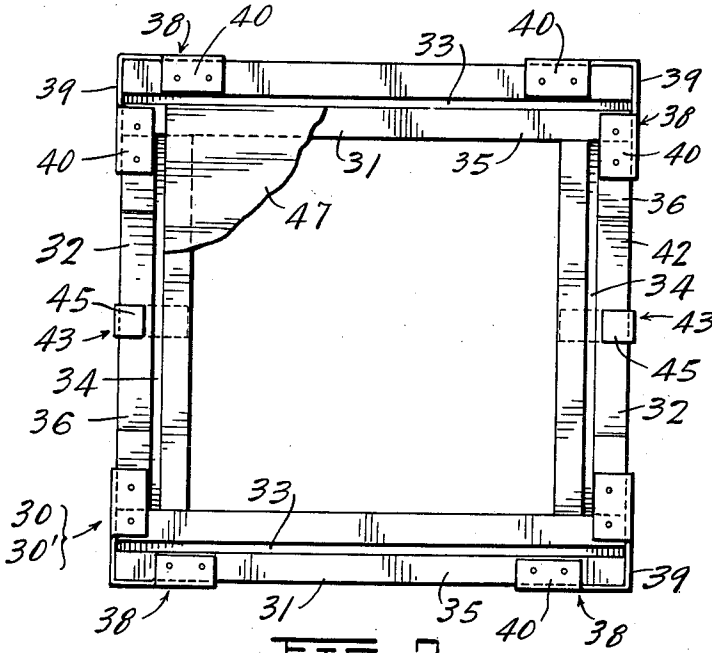


FIG-2-

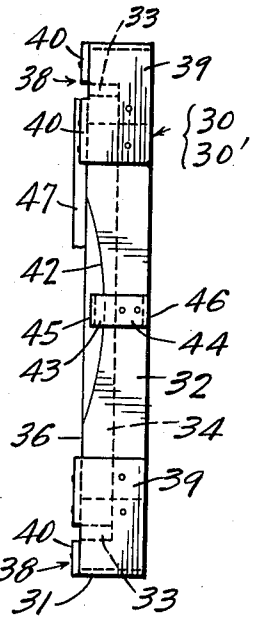


FIG-3-

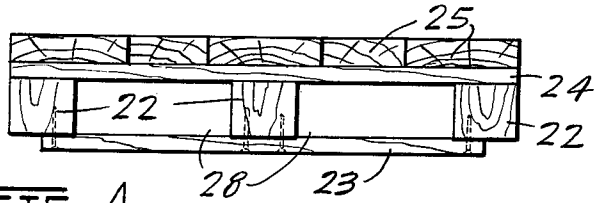


FIG-4-

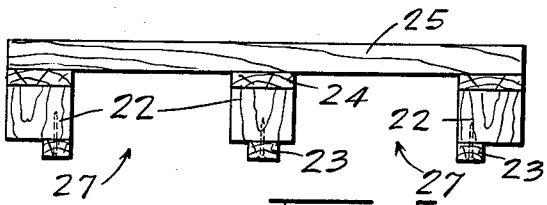


FIG-5-

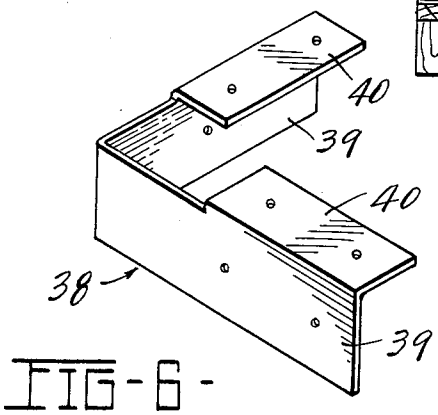


FIG-6-

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COLLAPSIBLE PALLET BOX

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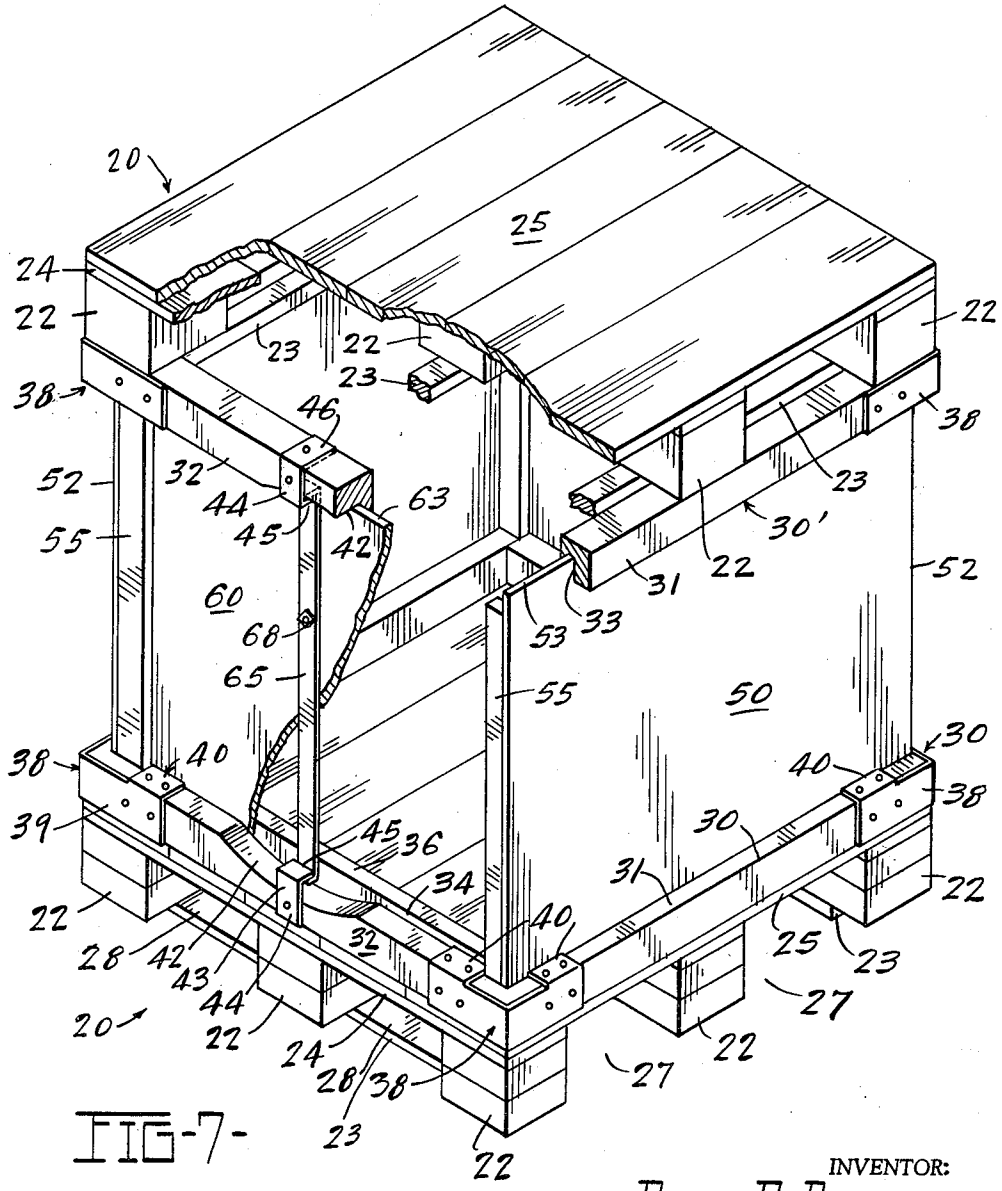


FIG-7-

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COLLAPSIBLE PALLET BOX

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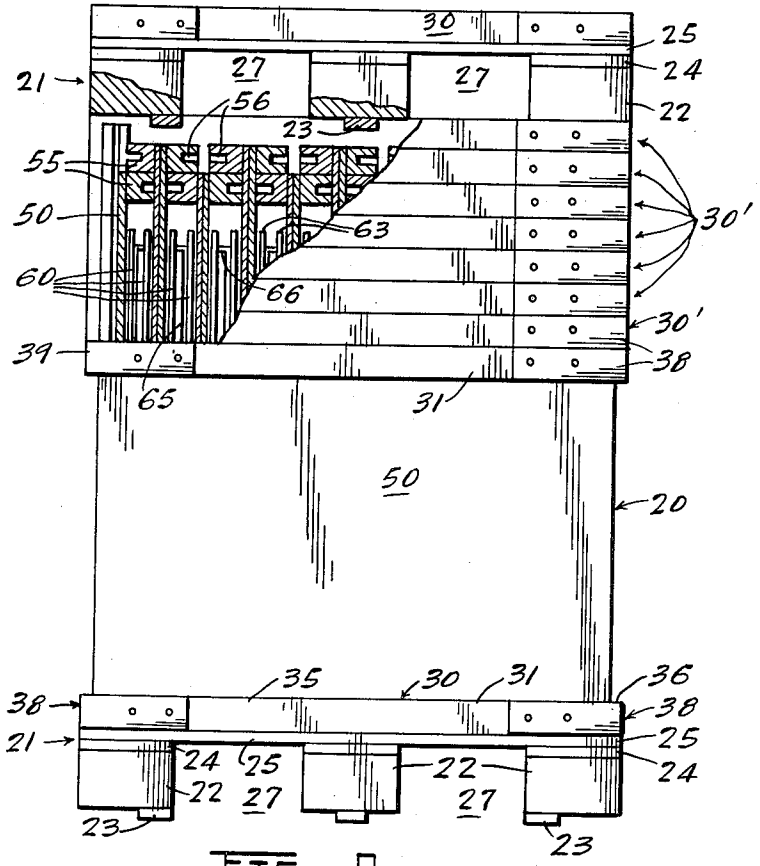


FIG-8-

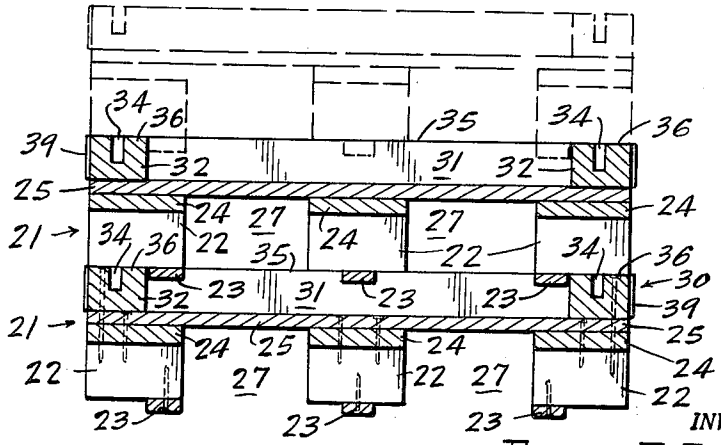


FIG-9-

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3,104,024
COLLAPSIBLE PALLET BOX

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7 Claims. (Cl. 217—12)

This invention relates to pallet boxes and particularly to collapsible pallet boxes that can be easily assembled for use and disassembled for storage or transport.

While it is desirable that pallet boxes be light in weight, yet sufficiently strong to carry heavy loads and to permit one box to be stacked on another, it is highly desirable that such boxes be so constructed that when disassembled, the various parts can be stacked for storage or transport in a minimum of space.

It is therefore a primary object of the present invention to provide a collapsible pallet box that is of strong, light weight construction and capable of being stacked in a minimum of space when not in use.

Another and important object of the invention is to provide a collapsible pallet box with latch or lock means for holding the several sections together after they have been positioned in assembled relation, the latch means serving further to add rigidity to the assembled structure.

A further object of the invention is to provide a pallet box that is assembled from a minimum of different prefabricated components or sections so that manufacturing cost and assembly time are nominal.

Still another object of the invention is to provide an improved pallet box with simplified, effective means to vertically align such boxes when they are stacked on top of one another.

Generally speaking, the box structure of the present invention is inclusive of a pallet member, which pallet member comprises: horizontally spaced blocks connected by vertically spaced stringers, transverse deck boards which overlie and connect the upper stringers to provide a generally horizontal deck spaced vertically above ground, and a bottom rectangular ring, rim or frame member extending horizontally around the periphery of the pallet and having an upwardly open groove spaced inwardly of its outer edges. The box structure whose bottom comprises the just described pallet member, comprises diametrically opposed pairs of vertical side and end panels having their lower edges seated in the groove, one of which pair of panels has attached grooved vertical corner posts along their opposite vertical sides into which post grooves the edges of the other pair of panels fit, a top rectangular ring, rim or frame member extending horizontally in opposed relation to the bottom rim or frame and having a downwardly open groove spaced inwardly of its outer edges to receive the upper edges of the side and end panels, and cooperating latch means carried respectively by at least one pair of panels and the vertically spaced side members of the top and bottom rings or frames adjacent such panels. If desired, the top ring or frame may be provided with a center panel which would act as a cover for the box. The rings or frames also may be provided with identical metal reinforcing corners. The stringers connecting the bottom of the spaced blocks of the pallet member are of such a length and spacing to fit within the top ring, rim or frame of the box structure to provide interlocking when one box is stacked on another. The dimensions of the panels are such that in knock-down condition several thereof may be carried in an assembled box for easy return shipping when empty.

The above mentioned and other features and objects of this invention and the manner of attaining them will become more apparent and the invention itself will be best understood by reference to the following description

of an embodiment of the invention taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is an exploded isometric view of a pallet box incorporating an embodiment of the present invention and illustrating the relationship of and the similarity between opposed pairs of parts that comprise the assembly;

FIG. 2 is a plan view of the top and/or bottom ring, rim or frame member or cover illustrating the relationship of the side and end rails and the grooves therein for receiving the side and end panels;

FIG. 3 is an end view of the top and/or bottom ring, rim or frame shown in FIG. 2;

FIG. 4 is a side view of the pallet member shown in FIG. 1 and illustrates the extent of the bottom stringers so as to facilitate stacking of assembled boxes of this invention;

FIG. 5 is an end view of the pallet member shown in FIG. 4;

FIG. 6 is a perspective view of a corner plate shown in FIG. 1 for reinforcing the corners of the rim or frame members;

FIG. 7 is an isometric view of an assembled pallet box of the invention with a portion only of a pallet member in stacked position thereon, with portions broken away to illustrate structural and assembly details; and

FIGS. 8 and 9 are front elevations illustrating a single assembled pallet box and a plurality of disassembled box parts nested and stacked to show the minimum space required to store such boxes when they are empty.

Referring to the drawings in detail, pallet box **20** is generally rectangular as distinguished from a cubical container, that is, its height is preferably different from either or both its width and depth, particularly for compact knock down storing of its parts. This box **20** comprises a pallet **21**, horizontally disposed ring or rim members **30** and **30'** spaced vertically and interconnected by a pair of side panels **50** and a pair of end panels **60** to provide an open ended container.

As shown in FIGS. 1, 4, 5, 7, 8 and 9, pallet **21** comprises a plurality of horizontally spaced block members **22** connected by vertically spaced stringers **23** and **24**. Deck of boards **25** extend transversely over upper stringers **24** and connect the stringers to form the pallet. The deck boards **25** provide a substantially horizontal deck onto which material may be loaded. The regularly spaced blocks **22** and their connecting stringers **23** and **24** serve to space the deck vertically above ground and provide longitudinal channels or spaces **27** and **28** between the blocks **22** into which the tines of a fork-lift truck may be inserted from any side of the pallet or box thereon for lifting and moving the same. The shorter and bottom stringers **23** serve another purpose, namely to facilitate stacking of assembled boxes, to be described hereinafter.

A rectangular bottom rim, ring or frame **30** (FIGS. 1, 2, 3, 7, 8 and 9) extends horizontally around the periphery of the pallet **21** and comprises a pair of side cleats **31** and a pair of end cleats **32** lying between and adjacent opposite ends of the side cleats **31**. The cleats **31** and **32** are longitudinally grooved at **33** and **34**, respectively, the grooves **33** and **34** extending vertically inwardly from face **35** of cleats **31** and face **36** of cleats **32**.

Ring or frame **30** also may be provided with outside corner reinforcements **38** (see FIG. 6) having side or leg portions **39** at right angles nailed or otherwise secured to the vertical edges of the side and end members or cleats **31** and **32**, each leg **39** having an inturned flange portion **40** contacting and secured to the adjacent horizontal faces of the respective side and end cleats embraced by each leg **39**, between the outsides and their grooves **33** and **34** of said cleats.

Diametrically opposite outside edges of end members **32** may be provided with arcuate notches **42** centrally of

which is provided a keeper member 43. Keeper member 43 comprises a C-shaped metal element having a base 44, short leg 45 and long leg 46. The keeper 43 is placed over the outer vertical edge of member 32 with the long leg 46 contacting the ungrooved horizontal surface thereof and the short leg 45 overlying the center of notch 42 in spaced relation thereto. Rim or frame 30 is nailed or otherwise secured to the pallet 21 around the periphery of its deck of boards 25, with its grooved face up to provide outwardly open channels adjacent the ends and sides of the pallet.

Top and/or bottom rims, rings or frames 30, 30' are identical and may be initially used interchangeably, it being understood that a selected bottom ring or frame is secured to the pallet 21 to become a part thereof. However, if desired, the top ring or frame 30' may be provided with a central panel 47 (see upper left corner of FIGS. 2 and 3) which may be attached to its lower or grooved side within the inner edge of said groove, thus forming a lid or cover for the box.

Side panels 50 may comprise plywood sheets of rectangular configuration having vertical edges 52 and horizontal edges 53. Adjacent each vertical edge 52 is a vertical post or cleat member 55 which terminates short of both horizontal edges 53. The cleats 55 are longitudinally grooved at 56 (see FIGS. 1 and 8) and serve as corner posts having outwardly open channels to receive the vertical edges 62 of the end panels 60 now to be described.

Like the side panels 50, the end panels 60 may also comprise plywood sheets of rectangular form having vertical edges 62 and horizontal edges 63. Either the panels 50 or the panels 60 (as shown) or both may be provided with metallic latch members 65 of elongated strip form having outwardly extending end portions or tongues 66 to provide catch portions which cooperate with the keeper portions 56 on rings or frames 30 and 30' in a manner described later. The members 65 are pivotally connected to panels 60 by means such as pivot bolts 68 located off-center with respect to the ends of the member 65 as well as to the horizontal edges 63 of the panels 60 so that the latch 65 tends to assume a vertical position when the panels are assembled vertically as shown in FIGS. 1 and 7.

The lower edges 53 and 63 of the side and end panels 50 and 60 project into the grooves or channels 33 and 34, respectively, with a close fit, and rest on the bottoms of such grooves so that the lower surfaces of the panels engage the inner and outer sides of the grooves. This tends to limit both inward and outward movement of the panels with respect to the pallet 21.

Similarly, the vertical edges 62 of end panels 60 project into the grooves or channels 56 in corner posts 55 with a close fit and engage the bottoms of such grooves so that the end surfaces of the panels 60 engage the inner and outer sides of the grooves to limit both inward and outward movement of the panels.

Top rim 30' is placed over the outer ends of the side and end panels 50 and 60 with its grooves 33 and 34 opening downwardly so that top horizontal edges 53 and 63, respectively, of the panels project into the grooves to be seated therein. The ends 32 and sides 31 of top rim or frame 30' are vertically aligned with those of bottom rim or frame 30, so that keeper members 43 are in position to be engaged by opposite ends of locking or latching member 65 as it is moved into locking position. As ends 66 of member 65 engage catches 45 outwardly thereof, member 65 draws the rings or frames 30 and 30' together to hold the box components in tight engagement. Should looseness occur in any of the parts, it will be noted that gravity will keep member 65 in locking position. Furthermore, the greater the load in the container, the tighter the latch 65 engages catches 45 due to outward pressure of such load.

Fabrication of pallet containers of this invention is greatly simplified due to the minimum of different components. Likewise, assembly of such containers requires only placing a pallet 21 on a supporting surface, selecting two like end panels and two like side panels and inserting their lower ends into grooves 33, 34 in bottom ring or frame 30 with the side edges 62 of end panels 60 inserted in grooves 56 in corner posts 55.

When it is desired to stack one pallet box 20 on top of another, such procedure is facilitated due to the provision of lower stringers 23 as previously indicated. As shown in FIGS. 8, 9 and 10, these stringers 23 terminate inwardly of the outer edges of outside block members 22 (FIG. 8) and are spaced transversely inwardly of such outside block members (FIG. 9). Stringers 23 are of a length equal to the space between the cleats 31 and 32 of ring or frame members 30' so that the blocks 22 at each corner of the pallet member 21 may engage the top of upper frame member 30' at the corner reinforcements 38 so that they rest vertically above the corner posts 55.

As particularly shown in FIGS. 8 and 9, open top pallet boxes of the present invention may be collapsed or knocked down for storage or transport in a minimum of space. For example, one pallet box 20 may be filled with a plurality of pairs of side panels 50 and end panels 60 by interspersing pairs of end panels 60, for example, between pairs of side panels 50, as illustrated in FIG. 8. A plurality of rings or frames 30' are then stacked vertically on top of the assembled box 20 and this stack topped by a pallet 21. Additional pallets 21 may then be stacked in a separate pile so that in the floor space normally required for two assembled boxes, fifteen knocked down boxes, for example, may be stored, the stacks being equal in height to two assembled boxes. This is made possible by the use of comparatively few different parts and dimensioning such parts so that they may be nested together in the space desired.

Although the foregoing description has been directed to a wooden box of a given size and relative dimensions, other sheet and strip material such as reinforced plastic materials, and/or metal may be employed for making the box and its integral pallet, and other relative dimensions and relative proportions may be used including change in size of the box, without departing from the scope of the invention.

While there is described above the principles of this invention in connection with specific apparatus, it is to be clearly understood that this description is made only by way of example and not as a limitaiton to the scope of this invention.

What is claimed is:

1. A knock-down rectangular box comprising: a bottom having a deck with spaced legs at least in the corners of said deck and connected at the lower ends by stringers to form a pallet and with an upwardly grooved frame affixed around the periphery of said deck, a pair of side panels whose lower ends are located in one pair of opposite reaches of said groove in said frame, a pair of end panels whose lower edges are located in the other pair of opposite reaches of said groove in said frame, said one pair of panels having vertically grooved posts attached to their opposite side edges into which grooves the adjacent edges of said other pair of panels are located, a top downwardly grooved frame identical to the deck frame which groove locates the upper edges of all of said panels, said stringers on said pallet being shorter than the outside dimension of said deck so as to just fit in the top frame for interlocking said boxes when one is stacked upon the other and so that said corner legs are directly and vertically aligned with and supported by said posts, identical metal reinforced corner pieces secured to each said frame, and means mounted on each one of a pair of said panels for releasably anchoring them to said frames, said anchoring means including a latching bar pivoted to each of said pair of panels, and separate keeper means on said top and said bottom frames for cooperating with each said pivot bar.

2. A box according to claim 1 including a panel in said top frame to form a lid for said box.

3. A box according to claim 1 wherein said keeper means are recessed in said frames to maintain their outside dimensions for easy knock-down stacking of said frames.

4. A collapsible pallet box comprising: a pallet member having a flat deck portion, top and bottom frame members in vertical spaced relation, complementary grooves in the opposite spaces of said frame members, said bottom frame member being secured to said pallet member so that the deck portion forms the bottom of a box, vertical corner posts extending between the corners of said top and bottom frame members, a pair of side panels and a pair of end panels extending between adjacent posts and between said frame members having opposite horizontal edges seated in the grooves in said top and bottom frame members, respectively, said corner posts having vertically extending longitudinal grooves and being fixed adjacent the parallel vertical edges of each panel of one pair of said panels, said vertical grooves receiving the parallel vertical edges of the other pair of said panels, latch means pivoted to the exteriors of a pair of opposing panels, and cooperating catch means on said frame members engageable by opposite ends of said latch means to lock said frame members and panels together to form an open ended box structure.

5. A collapsible pallet box according to claim 4 in which the latch means have inwardly directed catch portions.

6. A pallet box according to claim 4 in which the latch means is provided with an off-center pivot.

7. A pallet box according to claim 4 in which the pallet member is provided with bottom stringers shorter than said deck to fit within the top frame member of a lower box in a pair of vertically stacked pallet boxes.

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