United States Patent

Osborne et al.

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[54] CONTAINER AND PALLET

[72] Inventors: **Edward L. Osborne**, Kansas City, Kans.; **Franklin J. Wagner**, Kansas City, Mo.

[73] Assignee: **Westvaco Corporation**, New York, N.Y.

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[52] **U.S. Cl.** .....**229/23 R**, 229/14 R, 108/56

[51] **Int. Cl.** **B65d 13/00**

[58] **Field of Search** .....108/56, 53, 51, 52, 54, 55, 108/57, 58; 229/14 R, 23 R

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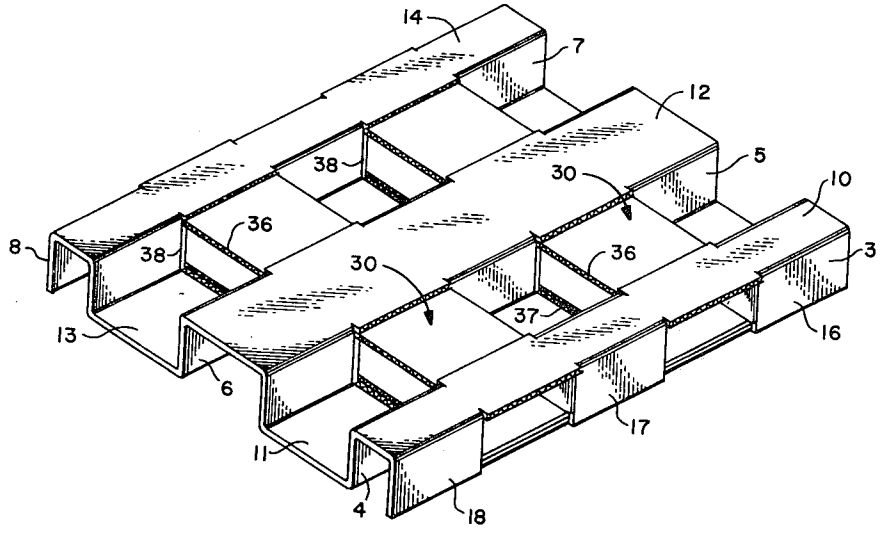
Primary Examiner—Davis T. Moorhead

Attorney—Larry C. Hall and Robert S. Grimshaw

[57] **ABSTRACT**

A composite container and pallet or separate pallet for four-way entry constructed from cut and scored blanks of corrugated paperboard or the like wherein the container includes cutout portions near the bottom thereof for receiving the tines of a forklift truck, and, the pallet includes a plurality of tubular members which are held in parallel spaced apart relation by a folded sheet of material having coplanar channels and supporting legs with flaps cut therein for receiving the tubular members.

6 Claims, 7 Drawing Figures



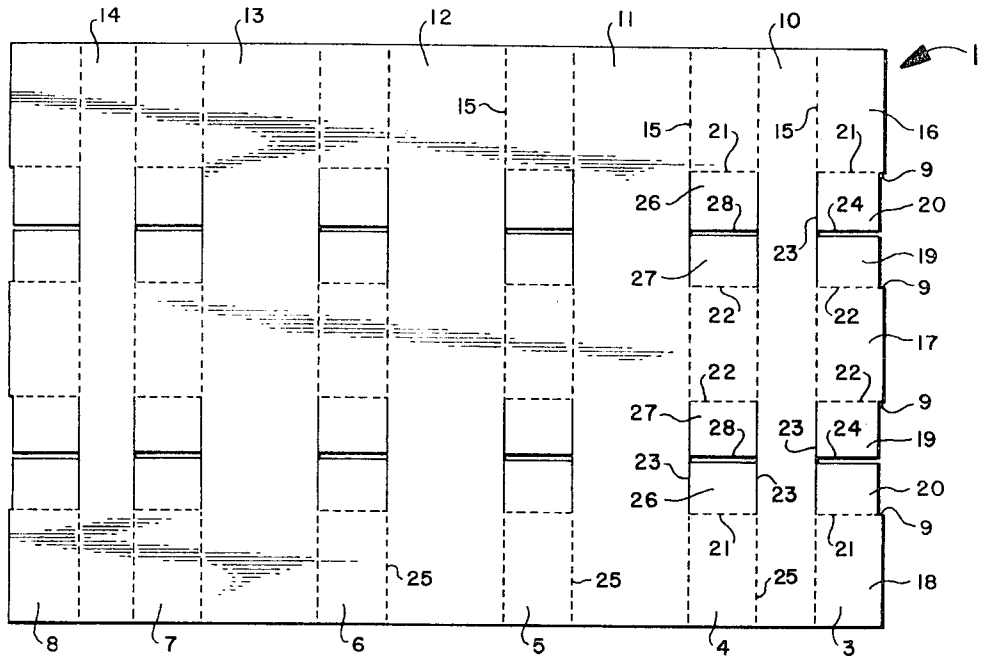


FIGURE 1

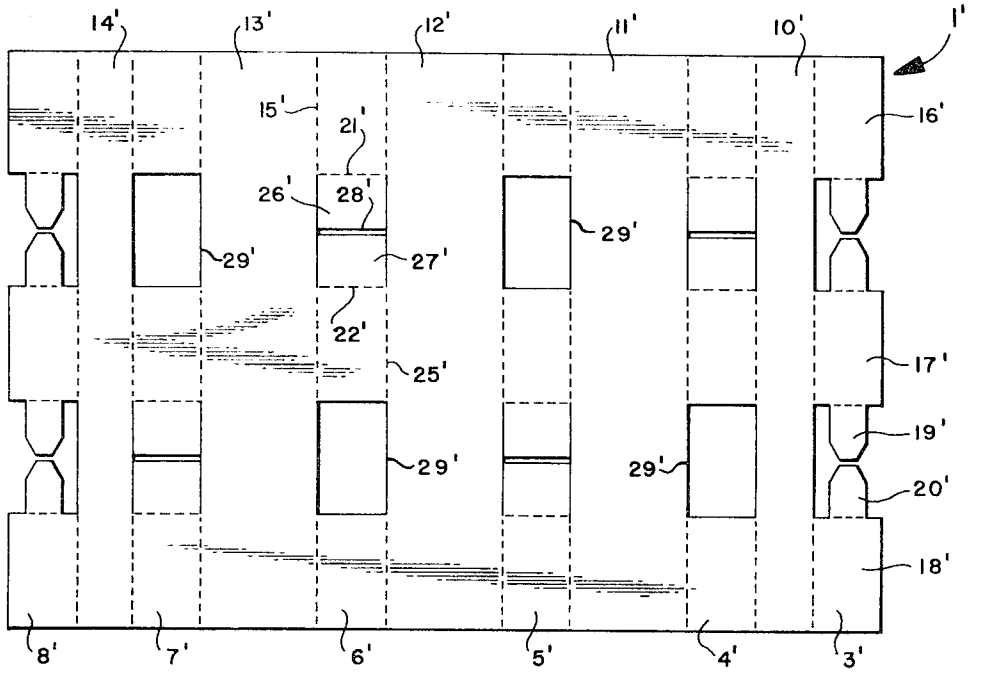


FIGURE 2

INVENTOR
Edward L. Osborne
Franklin J. Wagner

BY Larry C. Hall

ATTORNEY

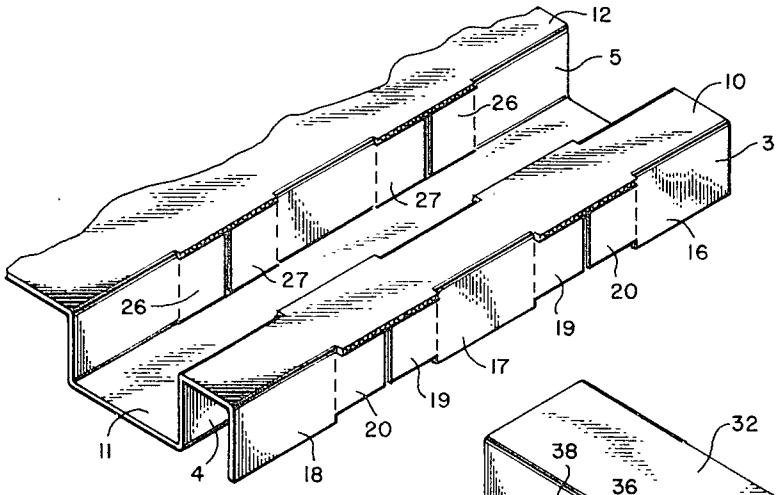


FIGURE 5

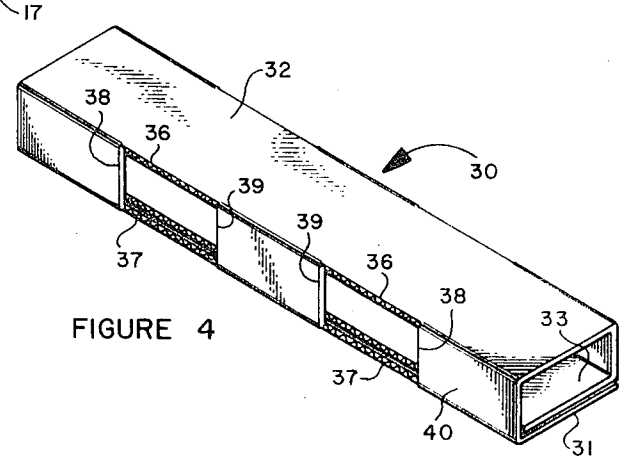


FIGURE 4

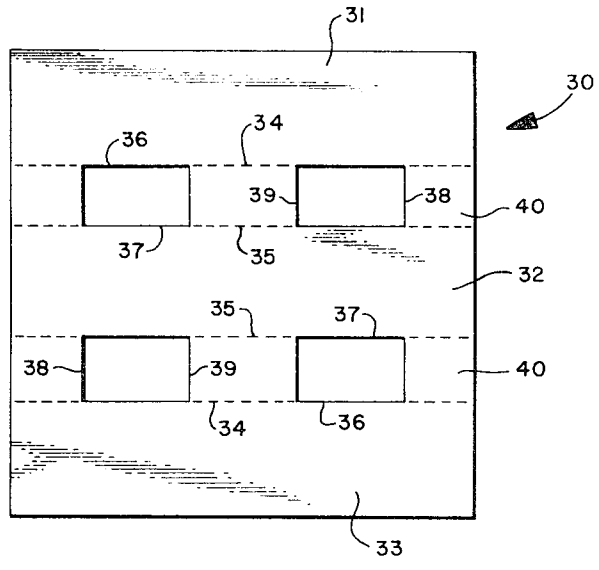


FIGURE 3

INVENTOR
Edward L. Osborne
Franklin J. Wagner

BY Larry C. Hall
ATTORNEY

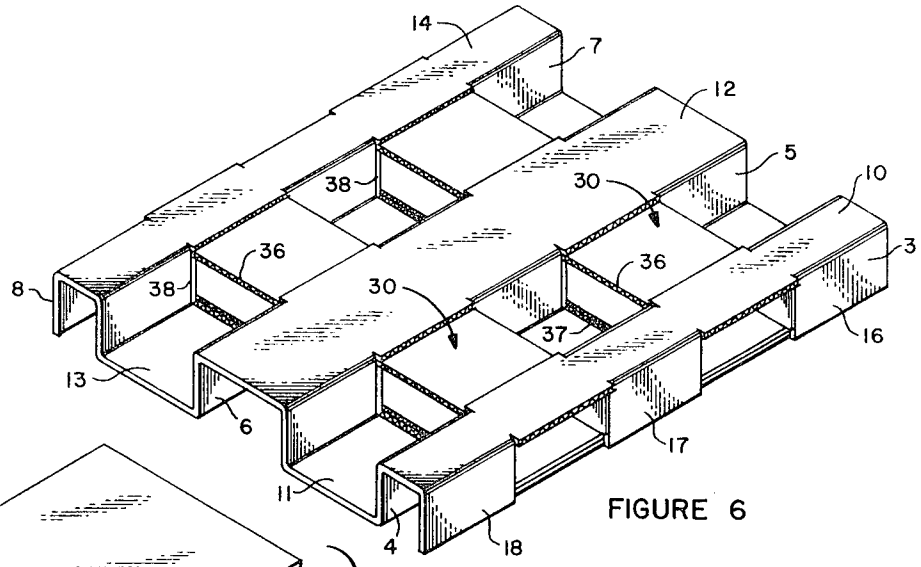
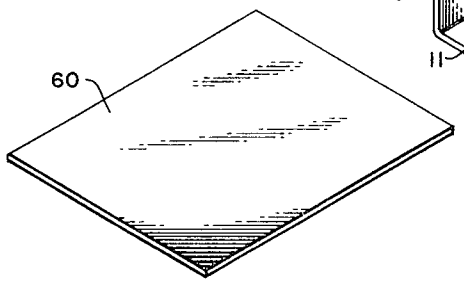
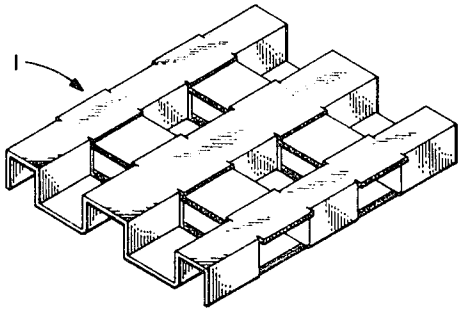


FIGURE 6





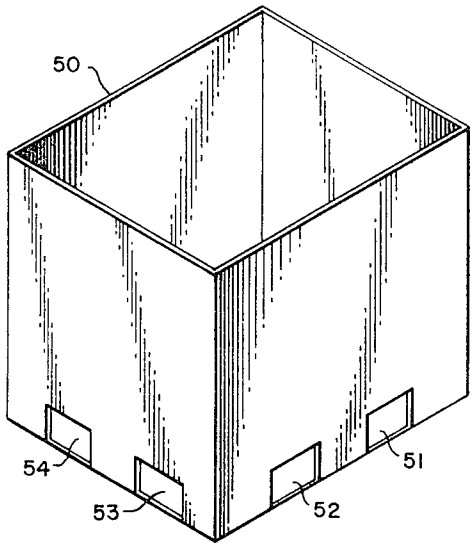


FIGURE 7

INVENTOR
Edward L. Osborne
Franklin J. Wagner

BY Larry C. Hall
ATTORNEY

CONTAINER AND PALLET

SUMMARY OF INVENTION

This invention relates to new and improved containers and pallets adapted for transport by forklift trucks. In particular, the invention is directed to a container having a built-in pallet, or, a separate pallet constructed from lightweight yet strong corrugated paperboard.

The use of various types of pallets in manufacturing operations has been standard practice for a great many years. Particularly, in the shipping of manufactured products, it is common practice to ship the products in convenient containers, such as paperboard boxes, which are stacked on shipping pallets for easy handling via forklift trucks.

Generally, the pallets used with containers for transport by forklift trucks consist of a wooden frame on which the container rests, thereby providing space between the container and the ground for the tines of a forklift truck. Such wooden frame pallets do not generally conform to the shape of the containers with which they are used, so that during shipping or storage of the containers and pallets, maximum use is not made of the available space. Furthermore, projecting edges of the pallets are subject to breakage during loading and unloading. In addition, standard wood frame pallets are heavy and relatively expensive, and not well adapted to the growing air cargo industry. If the containers are not shipped with the pallets, loading and unloading of the containers onto and off the pallet is necessary at shipping points before forklift truck transport is possible.

Of course, unless the pallets are made from relatively inexpensive materials, it is necessary that a manufacturer charge his customers for them, or, that the pallets be returned. Thus, the pallets become an element of expense introduced into the cost of the product as supplied to the consumer which adds no increment of value to the product itself. Further, it is an inconvenience both to the manufacturer and to his customer to handle or account for the pallets to see that they are paid for or returned. Accordingly, if a pallet can be provided which is strong enough to be satisfactory at least for a single use and which can be made sufficiently inexpensively that it can be destroyed after a single use, the above mentioned undesirable expense and inconvenience both to the manufacturer and to his customer will be eliminated. Furthermore, the development of a compact and efficient combination container and pallet, particularly for air cargo shipments, represents a significant step forward in the economics of shipping goods via air freight.

Accordingly, it is an object of the present invention to provide an improved container having a pallet integrally formed therein to provide maximum use of available space and eliminate pallet breakage. Another object of this invention is to provide an improved lightweight and inexpensive composite container and pallet, or custom made single pallet, particularly suitable for paperboard packaging and lightweight shipping. A further object of the invention is to provide a pallet with good shock absorbing capacity to insure damage-free shipping.

According to the present invention, the composite container and pallet and custom made pallet are made in separate parts which are replaceable and reusable and which also are collapsable for shipping and reuse.

In order to accomplish these results, the present invention contemplates the provision of a container of paperboard or other suitable material having cutout portions in at least one sidewall near the bottom for the tines of a forklift truck. The baseboard, on which the product is placed may comprise a single paperboard panel or a snug fitting inner container, and is spaced from the bottom of the container by the pallet structure which is independently assembled. The invention further contemplates the use of the integral pallet structure separately from the container as a custom made pallet conforming to the shape of the item or package to be shipped which is taped or strapped thereto.

Thus the pallet and composite container/pallet of this invention can be manufactured at extremely low cost; is readily adaptable to mass production techniques; can be initially fabricated and shipped as flat sheets for final assembly by the user's personnel, thereby effecting substantial savings in the pallet manufacturer's shipping costs; can be assembled quickly, easily and inexpensively; and, which has sufficient strength for a single use for shipping purposes, but which could readily be disassembled after a first use for subsequent re-use.

DESCRIPTION OF DRAWING

FIG. 1 illustrates a top plan view of a sheet of material suitably cut and scored so that it may be fabricated to form a pallet structure as embodied in this invention;

FIG. 2 shows a plan view similar to FIG. 1 of a second embodiment of the blank structure;

FIG. 3 shows a top plan view of a sheet of material suitably cut and scored to form the tube-like structures which cooperate with the folded blank of FIG. 1 or FIG. 2 to provide four-way entry of the pallet structure of this invention;

FIG. 4 illustrates an isometric view of the tubular member as formed from the blank of FIG. 3;

FIG. 5 shows a fragmentary isometric view of the FIG. 1 blank structure partially folded and prior to accepting the tubular structures formed from the blank of FIG. 3;

FIG. 6 is an isometric view of the completed pallet structure formed from the blanks of FIGS. 1 and 3; and,

FIG. 7 shows the composite container and pallet structure in sequence prior to being assembled.

DETAILED DESCRIPTION

In general the composite container and pallet of this invention comprises an outer container which is slotted at its lower end to permit four-way entry of lift truck tines; some type of baseboard either in the form of a single blank or a snug fitting inner container in which the goods are packaged; and, a pallet structure which fits within the outer container and which includes openings therein in alignment with the slotted openings of the outer container for accommodating the forklift truck tines. The outer container may take the form of a conventional regular slotted container or it may be custom designed for the particular product to be packaged. The only requirement being that the lower end thereof be slotted for entry of the forklift truck tines. Similarly, the inner container or baseboard member may be conventional in construction, the choice being determined by the structural requirements of the packaged product. The pallet structure is formed generally from single sheets of foldable material such as corrugated paperboard. A primary sheet of material is cut and scored to form a plurality of parallel, integral channels having upper and lower coplanar integral flanges connected between the side walls thereof. Flaps are then cut from the sides of the respective channels to provide spaces for accepting preformed slotted tubular elements constructed from secondary sheets of material. The flaps are adapted to be folded over in overlapping engagement with one another to affix the tubular elements in place and provide integrity for the pallet structure. The upper and lower coplanar flanges formed by the integral channel members thus constitute the longitudinal leg members of the pallet while the slotted tubular members constitute the transverse leg members of the pallet structure.

Referring now to the invention in more detail, the embodiment of the pallet portion of the invention herein selected for primary consideration consists of a first cut and scored blank of material 1 which forms a base structure, and two or more cut and scored blanks of material 30 which comprise the transverse tubular elements. In particular, the base structure 1 shown in blank form in FIG. 1 consists of a sheet of material which is properly cut, as by punching or on a die-cut press, and having appropriate fold lines therein for forming the desired base structure. The solid lines in FIG. 1 located interi-

orly of the blank represent cut lines while the dotted or broken lines correspond to fold lines. The cut and fold lines extending longitudinally in FIG. 1 are arranged to define five integral channel zones designated generally by the numerals 10, 11, 12, 13 and 14. Each of these channel zones when properly folded provides the supporting legs of the base structure. FIG. 6 illustrates the channel zones as forming three upper legs 10, 12 and 14 and two lower legs 11 and 13. Each of the leg members is connected to one another by the side walls 15 of each channel member and as such presents identical leg areas which vary only in width since they are all of the same height.

In FIG. 1, the first channel or leg member 10 and its adjacent side walls 15 are applied with reference numerals, and a detailed description of the leg 10 and its construction should provide a clear understanding of the base structure since each of the legs are identical in their mode of assembly. The upper leg member 10 (or lower, if the basic base structure is turned over) consists of a first end side wall 3 which is folded ninety degrees about longitudinal fold line 15; the leg member upper surface 10; a second longitudinal fold line 25 parallel to the first longitudinal fold line 15 and, a second interior side wall 4 which is folded ninety degrees about the second fold line 25 toward the first side wall 3. This folding sequence yields the channel shaped structure necessary to fabricate the first upper leg member 10. The first end wall 3 has the same construction as the second end wall 8 while the intermediate side walls 4–7 each have the same construction. In the preferred embodiment, end walls 3 and 8 are divided into three approximately equal sized panels 16, 17 and 18 by transverse fold lines 21 and 22. Panels 16 and 18 are defined by fold lines 21 and 15 while panel 17 is defined by the parallel fold lines 22 and fold line 15. Between panels 16 and 17 and 18 there is formed the flapped openings for accepting the transverse tubular members 30 (FIG. 4). The flaps 19 and 20 formed in each end wall 3 and 8 are preferably bound by a longitudinal cut line 23 and a transverse cut line 24. Each of the flaps 19 and 20 respectively are then hinged at 22 and 21 to their adjacent panel members 16, 17 and 18. The flapped openings in the intermediate legs 4, 5, 6 and 7 each include flap elements 26 and 27 formed by the longitudinal cut lines 23 lying on the fold lines 15 and 25 and the transverse cut line 28. Each of the flaps 26 and 27 are then hingedly attached to their respective side wall 4, 5, 6 or 7 along fold lines 21, 22 respectively. Note in FIG. 1 that the transverse fold lines 21 and 22 and transverse cut lines 24, 28 are aligned with one another respectively in the intermediate side walls 4–7. This orientation of fold lines and cut lines allows the flapped openings to accept the transverse tubular members without binding or interference.

Each of the end walls 3 and 8 further provide a slotted region 9 at the lower end of each flap 19, 20 for the purpose of accepting a tubular member having a height equal to the full height of the panels 16, 17, 18 less only the thickness of the material from which the base structure is made. The reduced size of end flaps 19 and 20 as compared with the intermediate flaps 26, 27 allows the end flaps to be folded around and inserted inside the tubular members 30 after the latter are fitted within the flapped openings provided therefor. This arrangement gives integrity to the pallet structure as a whole and retains the transverse elements in position within the base structure. The full sized flaps 26, 27 in the intermediate side wall legs 4–7 are each folded into the adjacent channel area to allow the tubular member to pass therethrough.

Thus the basic base structure of the pallet of the present invention is assembled by folding the blank 1 along the alternate parallel fold lines 15 and 25 to form the plurality of channel leg members 10–14. FIG. 5 illustrates a partial perspective of the base structure of the pallet folded as set forth above and arranged to accept the preformed tubular member 30 of FIG. 4. In the illustrated condition, the flap elements 19, 20 in end walls 3 and 8 and the flap elements 26, 27 in intermediate walls 4–7 are still in their original position preparatory to accepting the tubular member 30.

The finished tubular member 30 as shown in FIG. 4 is assembled from the blank structure illustrated in FIG. 3 and is cut and scored so as to provide the four-way entry desired for the pallet structure. The blank 30 (FIG. 3) includes in its preferred form three full width panels 31, 32, 33 and two side panels 40. The panels 31, 32 and 33 cannot each have the same width dimension since they must be folded over adjacent one another as shown in FIG. 4, however, panels 31 and 32 are substantially equal in width with panel 33 being reduced in width by an amount equal to the thickness of the material from which the tubular member is formed. Similarly, one side panel 40 is of full width, and equal to the height of a side wall 3 for instance of the base structure, less an amount equal to the thickness of the material from which the base structure is constructed. The second side panel 40 is reduced in size an additional amount equal to the thickness of the material from which the tubular element 30 is constructed. These different dimensions and the requirements for the different dimensions should be apparent from a close examination of FIG. 4.

Two pairs of fold lines 34 and 35 define the relative widths of the different panels 31, 32, 33 and 40. These fold lines extend throughout the width of the blank 30 and also provide the location for the cut-outs necessary to provide four-way entry for the forklift truck. The cut-outs in side panels 40 are defined by cut lines 36, 37 and 38, 39. The cut-outs must be carefully located on the side panels 40 so that they line up with the lower leg channels 11 and 13 of the base structure 1 when assembled therewith. The completed pallet structure of FIG. 6 illustrates this orientation as desired.

The final assembly of the pallet structure takes place as shown in FIGS. 4 and 5. In these two Figures the pre-formed tubular element 30 is about to be inserted into the flapped areas of the base structure 1. Initially, flaps 19 and 20 are folded outwardly, away from the base structure to allow the first entry of the tubular member 30 through the side wall 3. The interior flaps 26, 27 being full cut, have a height dimension which allows them to be folded in either direction, i.e., interiorly of the upper leg channels 10, 12 and 14, or interiorly of the lower leg channels 11 and 13. Thus, after the tubular members are inserted completely across the base pallet structure, the interior flaps 26, 27 give additional stacking strength to the pallet while the side wall flaps 19 and 20 are folded around the ends, and, interiorly of the tubular members to lock the tubular members in position within the confines of the base structure 1. Of course the second embodiment of the base structure illustrated in blank form in FIG. 2 would not be quite so difficult to construct since it employs cutouts at selected places along the intermediate walls 4, 5, 6 and 7 rather than the flaps 26, 27 as shown in the FIG. 1 embodiment. This latter construction would, however not have the strength of the FIG. 1 construction because of the reduced amount of material in the pallet.

Thus there is formed a pallet structure with coplanar leg channels 10, 12, 14 and 11, 13. Transverse to these legs there is inserted the slotted tubular elements 30 having their slots aligned with the leg channels 11 and 13 to permit the entry of the forks of a lift truck from any of the four sides of the pallet. Accordingly, the integrated pallet formed as described could be used separately without an outer container or, of course, as defined in its preferred form, with an outer container as shown in FIG. 7. The composite construction formed with the elements disclosed in FIG. 7 includes an outer container 50 of any desired construction, i.e., regular slotted container, overlap slotted container, etc., it being only necessary that the container include the lift truck fork openings 51–54 shown therein. The openings 51, 52 in two opposite side walls and 53, 54 in the other two opposed side walls are carefully cut to align with the forklift openings in the pallet 1. Thus the composite container is constructed by inserting the pre-formed pallet into the outer container 50 then adding the base pad 60 as a false floor. It should be recalled however, that the base pad 60 could take the form of a tightly fitting inner container if desired. In addition, the closure for the outer container

could readily assume any convenient form including a cover cap or conventional flaps and tape or staples.

While the material from which the pallet and container of the invention is made may be anything convenient or effective for the purpose, said pallet and container has been primarily designed with corrugated paperboard in mind and such material is particularly effective and inexpensive. When such material is used, or any other material having greater strength in one direction than in the other, care should be taken that the alignment of the elements of greater strength should be perpendicular in the pallet channel walls. Thus elements of greater strength will be aligned in the walls **3–8** and in the flaps **19, 20** and **26, 27** so that they will be vertical upon the folding and assembly of the base blank **1** and therefore, be in a position to provide maximum strength to the leg structure.

It will be seen that only a single die-cut operation is required to form the blank of FIGS. **1** or **2**, and the blank of FIG. **3** so that they can be fabricated into the desired product. Similarly, the outer container and inner container or base pad can be similarly formed as desired. Thus the pallet and/or combination pallet and container herein disclosed is well adapted for mass production techniques and it is particularly well adapted to fabrication by automatic machinery. The components of the invention could be shipped in flat form for maximum economy to the point of use and same could be formed quickly and easily into the required shape with a minimum of time and expense.

Thus, this type of construction is well adapted to manufacture at a minimum cost in that it can be made using relatively inexpensive techniques. However, the pallet alone or the composite container will be strong and sturdy and of light weight construction. It is therefore highly versatile and well adapted to meet a variety of different use requirements including air transport shipping.

Although particular, preferred embodiments of the invention have been disclosed hereinabove for illustrative purposes, it will be understood that variations or modifications thereof are fully contemplated within the scope of the claims appended hereto.

We claim:

1. A four-way entry pallet construction comprising in combination:

a. a base structure fabricated from a sheet of foldable material cut and scored to form a plurality of parallel channels having alternating and coplanar upper and lower leg panels connected together by integral intermediate side walls with an end side wall attached to the free edge of each end leg panel;

b. said intermediate and end side walls each having a first series of openings therein for accommodating at least two separate tubular members transversely of said channels; and,

c. at least two tubular members for insertion in said first openings and characterized as having additional openings therein which become aligned with certain of said channels upon insertion of said tubular members in said first openings.

2. The pallet construction as defined in claim **1** wherein the first series of openings in said intermediate side walls are cut to form flaps which are hingedly attached to the opposite side edges of said first openings, corresponding flaps on each of said adjacent intermediate side walls being folded over in overlapping engagement to accept the said tubular elements.

3. The pallet construction as defined in claim **2** wherein the first openings in said end side walls are cut to form flaps which are hingedly attached to the opposite side edges of said first openings, corresponding pairs of flaps in each end side wall being folded inside of the respective tubular members after the said tubular members are fitted within the flapped openings provided therefor.

4. The pallet construction as defined in claim **3**, wherein the additional openings in each of said tubular members may be aligned with either the upwardly opening channels or the downwardly opening channels for accommodating a forklift truck from any of the four sides of the pallet.

5. A four-way entry pallet construction comprising in combination:

a. a base structure formed from a sheet of corrugated paperboard or the like having a plurality of spaced parallel scores extending longitudinally thereof between a pair of opposed side edges and defining the side margins of a plurality of leg panels;

b. said sheet being folded on the spaced parallel scores to position top leg panels in substantially one horizontal plane, and bottom leg panels in a different horizontal plane;

c. a plurality of side walls interconnecting the top and bottom leg panels;

d. said side walls each having a first series of openings to receive at least two separate tubular elements transversely of said side walls;

e. wherein any two adjacent side walls joined by a bottom leg panel defines a channel opening upwardly and one of the first mentioned side walls joined by a top leg panel and another side wall defines a channel opening downwardly;

f. each of said tubular members having additional openings therein which become aligned with either the upwardly opening channels or the downwardly opening channels upon insertion of said tubular members in said first openings to accept a forklift truck from any of the four sides of said pallet.

6. A composite shipping container and pallet comprising in combination:

a. a container structure having cutout portions therein at the bottom of each side thereof for receiving the tines of a forklift truck from any side thereof;

b. an integral pallet means adapted to fit inside said container and having forklift openings therein which are aligned with the cutout portions in the container side walls; and,

c. a base element which is fitted inside said container on top of said pallet to support the product to be shipped therein;

d. said pallet means including a base structure having a plurality of parallel channels with alternating and coplanar upper and lower leg panels connected together by integral intermediate walls with an end wall attached to the free edge of each end leg panel;

e. said intermediate and end walls each having a first series of openings therein for accommodating at least two separate tubular members transversely of said channels; and,

f. at least two separate tubular members for insertion in said first openings and characterized as having additional openings therein which become aligned with certain of said channels upon insertion of said tubular members in said first openings.

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