PRESS-ON PALLET SUPPORT

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ABSTRACT

Metal supports of open frame or slatted construction for self-fastening to a wooden or composition decking of a pallet to provide support for the deck. Each support has a plurality of prongs extending from at least one end of an open frame upright wall to penetrate into the pallet decking during construction of the pallet. The walls of the support member may be tapered so as to facilitate the nesting of a plurality of like supports to reduce storage space requirements and increase ease of handling prior to use in assembly of the pallet.

10 Claims, 11 Drawing Figures
PRESS-ON PALLET SUPPORT

BACKGROUND OF THE INVENTION:

1. Field of the Invention

This invention relates to supports for a pallet deck and more particularly to a support for a pallet deck having prongs that are pressed into and through the deck to fasten the support to the deck members, thus eliminating the need for conventional fasteners, such as nails, staples, etc.

In my prior U.S. Pat. No. 3,641,948 entitled "Press-on Support for a Pallet" granted Feb. 15, 1972, I disclosed various modifications of a solid wall press-on type pallet support having a plurality of longitudinal re-enforcing ribs integrally formed therein, each of the ribs terminating at one or both ends in a prong or dual prongs, and a plurality of horizontal tabs spaced between the ribs for contacting and supporting the pallet deck after fastening of the support thereto.

Such a solid wall metal support performs very satisfactorily. However, production of such supports requires the use of expensive forming and molding dies. I have found that such die costs can be drastically reduced by the use of a mesh or open frame metal wall construction and it is to that end that the present invention is directed.

2. Description of the Prior Art

Pallets are widely utilized in connection with the handling, storage and distribution of merchandise. Typically, wooden pallets comprise rectangular single or double deck platforms, constructed of plywood sheet or other material, or spaced individual lumber boards fastened to a plurality of spaced wooden support runners or blocks arranged with or without stringer boards. The wood supports are positioned with respect to each other so as to provide proper load support distribution and also to permit the insertion of the forks of a forklift truck or the forks of a handlif truck under the top deck, so that the pallet and any load thereon can be lifted, moved, and stacked in storage.

Four-way entry pallets are utilized widely in a variety of industries since this type pallet permits insertion of lifting forks beneath the top deck on any of the four perimeters of the pallet. Typically, a four-way entry single deck wooden pallet is constructed by nailing, stapling or gluing nine individual wooden blocks to the bottom surface of solid sheet material, at equally spaced distances in columns and rows of three supports each. Alternatively, three elongated wooden support runners, each equally spaced and extending the entire length or depth of the pallet deck, are utilized as support members in the assembly of a two-way entry pallet.

The construction of a four-way entry pallet using support blocks and individual lumber boards in lieu of solid material for the top deck, generally requires the use of stringer deck boards to maintain the individual lumber boards in spaced relation. The stringer deck boards are attached to both the support blocks and the deckboards. In a double deck construction including a top deck of solid material and a bottom deck consisting of three individual lumber boards spaced apart to provide for receipt of a handlift pallet truck, stringer deck boards are not required.

As noted above, pallets may be of the single deck or double deck design in which a parallel, full or partial, bottom deck is furnished for additional rigidity and horizontal support. In the double deck construction, the wooden support members are generally nailed to both the top and bottom deck components.

Pallets that have been constructed with wooden supports fastened to the decks with nails or staples tend to loosen with continued usage and the gradual drying out of the lumber. This condition causes the nails or staples to pull out and protrude from the top surface or deck of the pallet. This problem is a major one and is due to the fact that it is generally not possible to obtain any clinch of the nail or staple used to fasten the decks to the solid wood support block or runner.

In many instances the protruding nail head or staple damages the merchandise stored on the pallet by tearing or ripping the goods. It is desirable to provide a pallet support which incorporates use of wire-like vertical members having prong ends, with or without hori-
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Horizontal wire-like pieces connected thereto, partially embedded in a moldable compound to provide additional flat surface support area for the deck components.

Other advantages and features of the present invention will become more apparent from the following description and claims, and the accompanying drawings, wherein:

**BRIEF DESCRIPTION OF THE DRAWINGS:**

FIG. 1 is an exploded perspective view of a typical double deck pallet, having a solid top deck and three bottom deck boards, constructed with the support illustrated in FIG. 2;

FIG. 2 is a perspective view of one embodiment of an angle shaped support for a pallet deck in accordance with the present invention;

FIG. 3 is a fragmentary cross-sectional view illustrating the manner in which the prongs of the support are inserted into the pallet deck members;

FIG. 4 is an exploded perspective view of a typical pallet constructed from a plurality of top deck boards, three stringer deck boards and three bottom deck boards, using the conical shaped nesting supports of FIG. 5;

FIG. 5 is a pictorial representation of the nesting feature of the support in FIG. 4;

FIG. 6 is a top plan view of another embodiment of the invention having a triangular shape;

FIG. 7 is a top plan view of still another embodiment of the support of this invention, having a four-sided diamond shape design;

FIG. 8 is a side elevation of a full runner type support of this invention, attached to a plurality of top deck boards and three bottom deck boards;

FIG. 9 is a top plan view of a full runner support of this invention, having a zig-zag design, for use in assembling a double deck pallet having solid top and bottom deck boards;

FIG. 10 is a perspective view of another embodiment of the support of this invention, having prong type vertical wire-like members embedded in a molded conical configuration of plastic or other suitable compound to provide increased rigidity and additional deck support bearing surface;

FIG. 11 is a perspective view of still another embodiment of this invention, using the embedded molded construction of FIG. 10, to form a full runner support for assembly of a double deck two-way entry pallet having a solid top and bottom deck boards.

**DESCRIPTION OF THE PREFERRED EMBODIMENT**

Referring now in detail to the drawings wherein like numerals indicate like elements throughout several views. FIGS. 1 and 2 illustrate one embodiment of a support in accordance with the present invention.

The support illustrated in FIG. 2 comprises a self-supporting substantially upright angle shaped unit of open framework construction, having a plurality of spaced-apart vertical wire rods 22, 24, 26, 28 and 30, welded or otherwise secured to a multiple number of horizontal spaced-apart wire rods 34, 36 and 38, to form an integral pallet support unit.

The spaced-apart vertical rods 22, 24, 26, 28 and 30, are tapered at the two ends to form pointed prongs 32, for penetrating the pallet deck members 44, 46, 48 and 50, and are held apart by horizontal rods 34, 36 and 38, which extend there-between.

Generally, the vertical and horizontal wire rod structure is rendered integral by welding, the horizontal rods being welded to the vertical rods at 40 the point of contact. The spaced-apart top horizontal rod 34 and bottom horizontal rod 38, support the pallet deck members. In the FIG. 2 embodiment, an intermediate horizontal rod 36 is provided, to furnish additional strength and rigidity for the support. After press-on fastening of the supports to the deck members, the top of the upper horizontal rod 34 of the support, contacts the underside of the top deck 44, and the bottom of the lower horizontal rod 38, contacts the upperside of the bottom deck boards 46, 48 and 50.

FIG. 1 illustrates the use of a plurality of supports, generally nine or ten, of the angle design, used in the construction of a four-way entry, double deck pallet, having a solid sheet top deck and three spaced-apart bottom deck boards. In this assembly a total of ten supports are used, three units in each of the two exterior rows and four in the center support row. In the assembly of the pallet, the supports 20 are placed and positioned between the top and bottom deck boards, generally assembled on a conveyor line. This assembly of deck board and support components, is then moved, on the conveyor, into a hydraulic or other type press having steel backing plates. The press is then activated and the support rod extremities are pressed into and through the deck members and the prongs 32 clinched, in a matter of seconds, thus completing the construction of the pallet.

The tapered and pointed prongs 32 penetrate and are pressed through the deck members 44, 46, 48 and 50, and because of the taper, are bent and deformed back into the surface of such members upon contact with the press metal backing plates 52 and 52b as shown in FIG. 3. The pallet deck members 44, 46, 48 and 50, are pressed on to the support prongs until one surface of the deck members is substantially flush with the upper and lower horizontal support rods 34 and 38.

FIG. 4 illustrates another embodiment of the support of the invention covering a conical shaped nesting support, used for the assembly of a four-way entry pallet having a multiple number of top deck boards, three stringer deck boards, and three bottom deck boards. This pallet 54 is formed from individual lumber boards 56, 58, 60, 62 and 64 which may be nailed, with nails clinched, to stringer boards 66, 68 and 70, to form a rigid top deck. This integral top deck or the individual top deck and stringer boards if not nailed together, along with the bottom deck boards 74, 76 and 78, are pressed on to the prongs 72 of the support simultaneously by use of press equipment as described...for assembly of the pallet shown in FIG. 1. In the FIG. 4 pallet, nine of the supports 72 are arranged in three equally spaced rows with three supports per row.

As can be seen in FIG. 4, the open framework wall of the conical shaped support 72 is slightly tapered vertically and inwardly as to permit nesting of a plurality of identical supports, to reduce storage and shipping space and facilitate handling of the supports prior to use. This nesting arrangement is illustrated in FIG. 5.

FIGS. 6 and 7 illustrate additional embodiments of the invention. FIG. 6 is a triangular shaped support and FIG. 7 shows a diamond shaped unit. Both of these de-
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signs, which are generally referred to as being of the closed type, can be furnished in a tapered configuration for nesting as well as the straight vertical wall design as shown in FIGS. 6 and 7. The material for these units as well as most of the other embodiments of the invention, would be cut from a continuous long strip and then formed or bent into the desired shape, angle, triangular, diamond, etc., with or without the corresponding ends of the horizontal rods welded or otherwise fastened together. If additional vertical support over and above that furnished by the support itself, is required, short blocks of wood or other material may be positioned within the enclosed support, prior to pressing such on the deck boards. After press-on assembly of the pallet, such supplementary support blocks are permanently secured inside the walls of the support, locked in by the top and bottom deck boards. Both the FIG. 6 and FIG. 7 supports can be used in the same type of pallet assembly as the angle shaped embodiment shown in FIG. 1, and the conical embodiment illustrated in FIG. 4.

FIG. 8 is an open framework full runner type pallet support, another embodiment of the invention. In this illustration, three of such runner supports are used with six top deck boards and three bottom deck boards, to assemble a two-way entry, double deck pallet. On each runner support, three prongs extend through the two top and the two bottom, end deck boards, and also through the top and bottom center deck boards. Whereas, only two prongs extend through each of the four intermediate top deck boards. The lower extremities of the vertical rods 22c are welded to the bottom horizontal rod 38c which is bent and formed to partially encompass the bottom deck boards 116 and 118 the bottom of which is flush with the bottom of the lower horizontal rod member 38c. The exterior runner supports are set-in from the ends of the top and bottom deck boards to eliminate and reduce splitting of the boards when such are pressed on the supports.

FIG. 9 is a runner type support having a longitudinal zig-zag shape, for use in constructing two-way entry double deck pallets. The zig-zag design provides more cross support of the deck members, running the width of the pallet, than would be provided using the straight runner type support illustrated in FIG. 10. A zig-zag runner support having a width of approximately 1½ inches, would provide deck cross support equivalent to a conventional 2 X 4 wood lumber runner support. Individual short zig-zag supports could also be used, in the same manner as the angle, triangular and diamond shaped units, for the assembly of a four-way entry pallet. In such construction, nine or ten support units would generally be used. The zig-zag design has another advantage, which is the off-setting of the prongs which reduces the possibility of board splits, particularly on individual lumber deck boards, during the press-on operation, that occasionally occur using the straight on-line prong arrangement such as that shown in the FIG. 8 embodiment.

FIGS. 10 and 11 represent additional embodiments of the invention and involve the use of vertical rods or vertical and horizontal rod members assembled to form a skeleton support which is embedded in a moldable plastic or other suitable compound. The purpose of such compound is to secure the rods in position, to provide the spaced-apart vertical fork clearance space required for forklift and hand truck handling, and also to provide additional flat support bearing surface for the deck members than that generally provided by use of only the top and bottom horizontal rods, as used in the other embodiments.

FIG. 10 shows a conical shaped molded support 122 having a plurality of vertical steel rods 22c, tapered at the ends to form prongs 32, which are embedded in a moldable compound 124. A circular shaped horizontally disposed rod 36f is secured to the vertical rods 22c at their points of intersection to add additional support to the vertical steel rods 22c.

FIG. 11 illustrates a skeleton type wire rod framework embedded in a plastic or other moldable compound 128 to form a rigid longitudinal shaped runner support 126. Although only one horizontal rod 36f is shown in this embodiment, the number of individual horizontal rods, as well as the number of individual vertical rods 22f, may vary, in accordance with (1) the overall thickness, height, grade of steel, and size and shape of the support, (2) type, size and quantity of the deck boards and any stringer boards to be used and (3) type, grade and capacity of the pallet to be assembled.

It is understood that the length of the prongs may vary according to the thickness of the deck components used including any stringer boards, and whether or not it is desired that prongs protrude through both deck boards and any stringer boards used. In stringer board construction of four-way entry pallets, where individual lumber boards are used for spaced-apart decking, the deck boards may be nailed and clinched to the stringer boards to form a top deck, by use of conventional nailing methods. Such top deck assembly would then be pressed on to one of the applicable supports of this invention together with any required bottom deck components.

It is contemplated that powered press equipment will normally be used to attach pallet decking simultaneously to nine supports at one time, thus providing fast and economical complete assembly of the pallet. However, by use of special hammers or other special manually operated mechanical equipment, attached of the supports can be accomplished on many types of decking material such as thin plywood, polyvinyl, fiberboard and hardboard.

Modifications are possible within the scope of this invention.

What I claim is:

1. A support for a pallet deck, said support comprising:
an upright grid-like frame of predetermined configuration including a plurality of spaced vertical wire-like elements held together by a plurality of spaced horizontal elements, each of said vertical wire-like elements having vertically spaced end portions with prong means extending from at least one of said end portions for penetration of a deck of a pallet in response to the pressing of the pallet deck against said prong means during the construction of the pallet.

2. The support of claim 1 further including a plurality of wire-like prong means extending from the other of said end portions for penetration of a second deck of said pallet in response to the pressing of a second pallet deck against the prongs during the construction of the pallet.
3. The pallet support of claim 2 wherein said grid-like frame configuration is substantially L-shaped when viewed in plan.

4. The pallet support of claim 2 wherein said grid-like frame configuration is substantially cylindrical when viewed in plan.

5. The pallet support of claim 2 wherein said grid-like frame configuration is substantially triangular when viewed in plan.

6. The pallet support of claim 2 wherein said grid-like frame configuration is substantially rectangular when viewed in plan.

7. The pallet support of claim 2 wherein said grid-like frame configuration is substantially serpentine when viewed in plan.

8. A support for a pallet deck comprising:
   an upright frame of predetermined configuration including a plurality of spaced, vertical wire-like elements, at least one horizontally disposed element intersecting said vertical elements, said upright frame having a central portion completely embedded in a substantially rigid body, preferably of plastic material, said substantially rigid body having upper and lower bearing surfaces spaced apart sufficiently to provide fork clearance, each of said vertical wire-like elements having an end portion projecting out of said substantially rigid body, each end portion having prong means for penetration of a deck of a pallet in response to the pressing of a pallet deck against said prong means during construction of the pallet.

9. The pallet support of claim 8 wherein said upright frame is embedded in a substantially rectangular mass.

10. The pallet support of claim 8 wherein said upright frame is embedded in a substantially conically shaped mass.