

United States Patent

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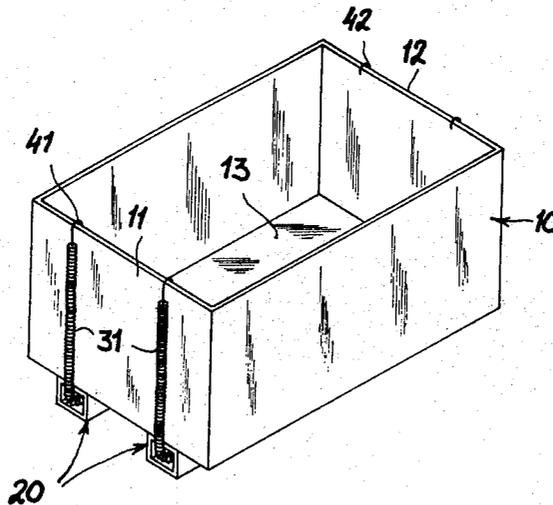
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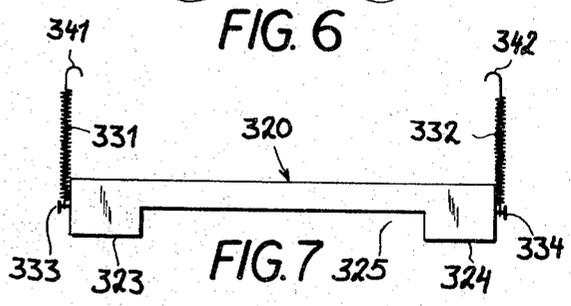
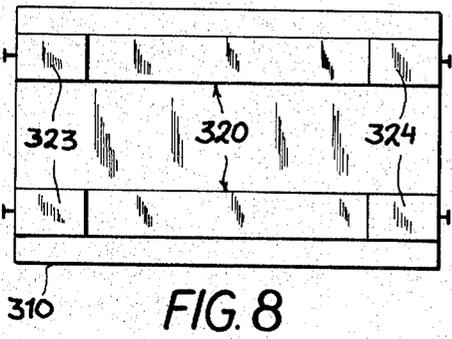
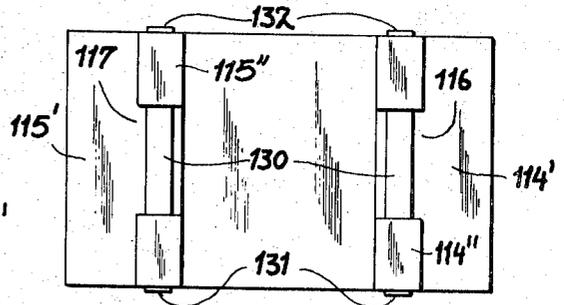
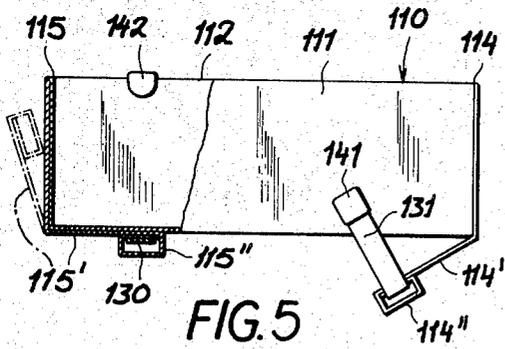
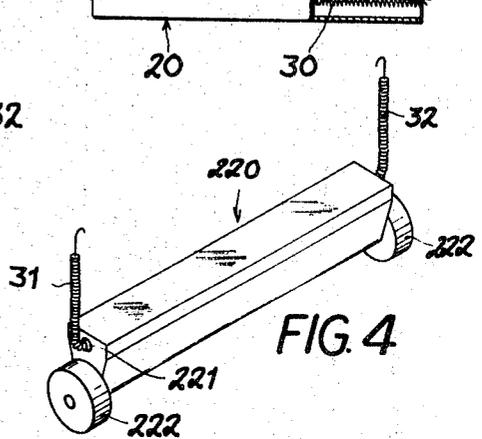
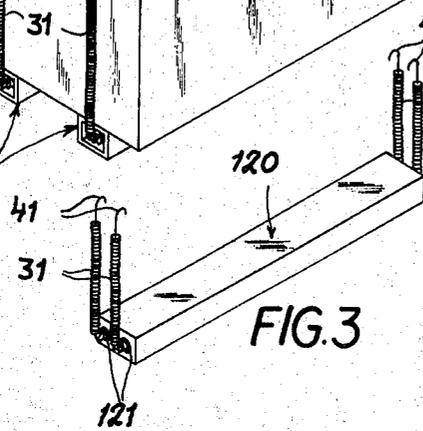
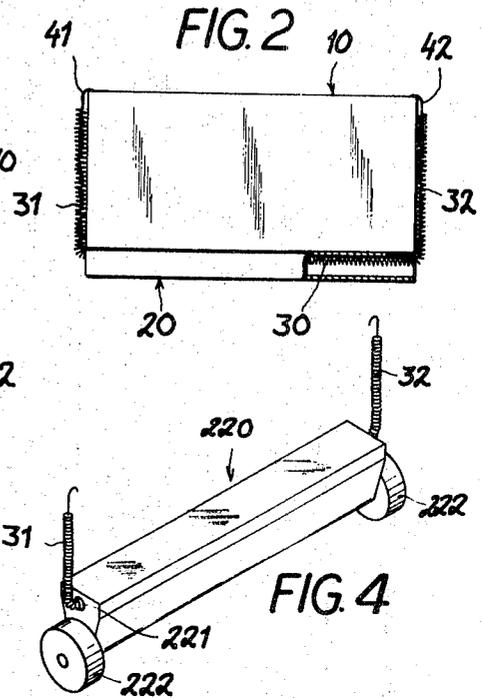
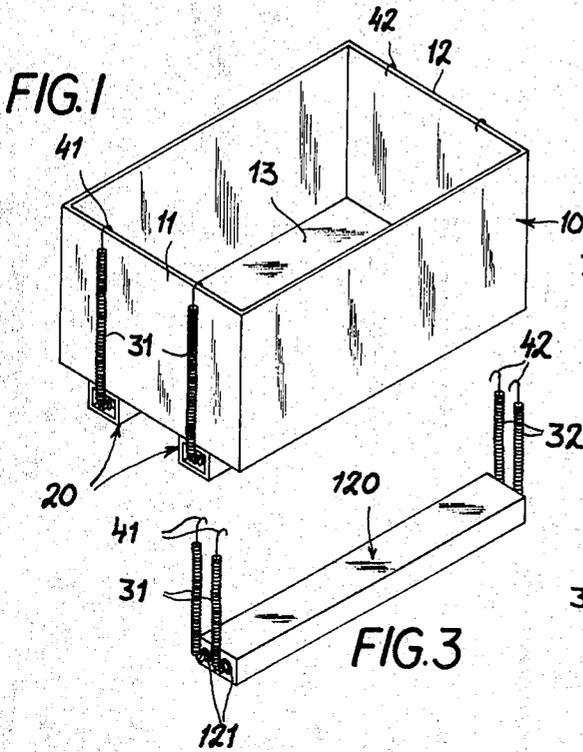
[54] **COLLAPSIBLE PALLET**
6 Claims, 13 Drawing Figs.
[52] U.S. Cl..... **220/69,**
108/51, 248/346, 280/79.2
[51] Int. Cl..... **B65d 7/42**
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206/60 (A), 65 (B); 229/23 (C), 23 (A), 23 (B);
108/51, 52; 248/346

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ABSTRACT: Two or more parallel legs or cleats are removably disposed at the underside of a container by means of flexible, elastic straps with extremities projecting from the ends of each cleat, these extremities being provided with hooks or other gripping formations for detachably securing them to the sides or the top of the container.





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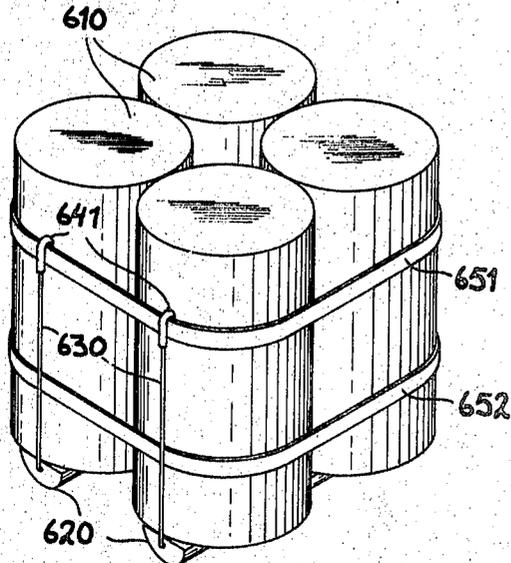


FIG. 11

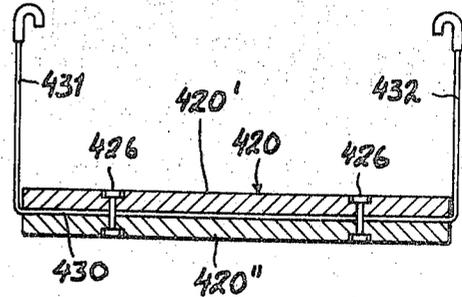


FIG. 9

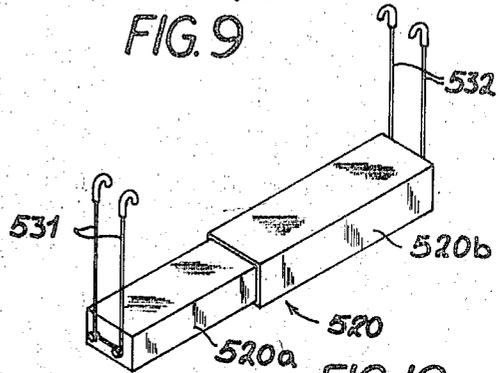


FIG. 10

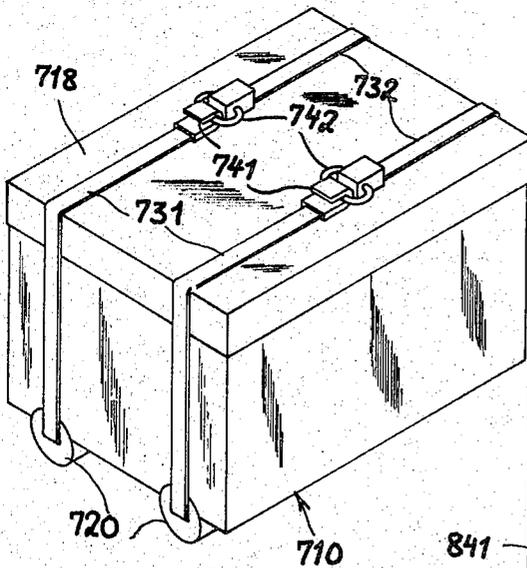


FIG. 12

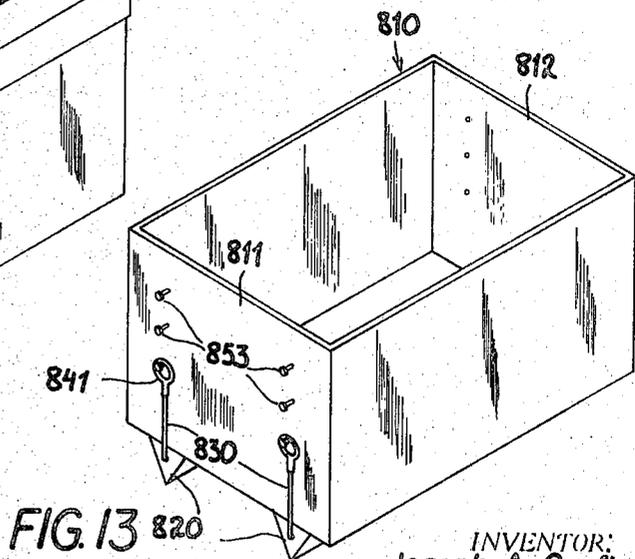


FIG. 13

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COLLAPSIBLE PALLET

My present invention relates to a detachable pallet structure designed to support a container for goods to be transported. Such pallets are used, for example, to form spaced-apart ribs or legs beneath the container bottom giving access to lifting forks by which the container may be raised onto a loading platform or a vehicle.

In U.S. Pat. No. 3,236,197 (Rossner) there has been disclosed a pallet construction formed from folded over extensions of a cardboard box, these extensions defining ribs which are temporarily held in position by adhesive tape so as to be detachable from the bottom of the box for purposes of stacking.

The general object of my present invention is to provide a detachable pallet structure which is more rugged and more universally applicable than the construction referred to above, permitting ready detachment of the bottom ribs when the container is to be collapsed or reduced in height for stacking or storage.

A more particular object of my invention is to provide means in such structure for firmly, albeit removably, joining two or more rib-forming members, referred to hereinafter as "cleats," to the container bottom, thereby not only facilitating the use of fork lifts or the like but also reinforcing that bottom during loading and unloading operations.

These objects are realized, pursuant to my present invention, by the provision of fastening means including, for each cleat, a pair of elongate, resilient elements which project upwardly from respective ends of the cleat along sidewalls of the container, these elements having upper extremities detachably secured to the container above its bottom; the length of the cleat substantially equals the spacing of these sidewalls so that the latter are more or less aligned with the cleat ends from which the resilient fastening elements emanate.

More particularly, the upper extremities of the fastening elements may be provided with gripping formations, such as hooks, eyes or the like, which can positively engage corresponding projections on the container walls. In the case of hooks, the fastener extremities can be secured directly to the upper edges of the respective sidewalls. The tension exerted by these fastening elements holds the cleats firmly against the underside of the container, thus stiffening it against deformation by the load carried therein.

According to another specific feature of my invention, each cleat is formed with one or more throughgoing longitudinal bores each traversed by a continuous flexible member which terminates, at opposite ends, in the aforescribed resilient fastener elements. This member, or its extremities, may be designed for example as a coil spring, a rubber band or some other resilient cord-shaped or straplike link.

The container referred to may be, as in the aforementioned Rossner patent, a box of cardboard or other foldable sheet material, in which case the cleats may again be formed as extensions of a pair of end walls of the box. The term "container" is also intended to encompass a group of several juxtaposed vessels held together by straps or other tie means to form a unitary assembly adapted to receive the goods to be transported.

The above and other features of my invention will become more fully apparent from the following detailed description of certain embodiments, reference being made to the accompanying drawing in which:

FIG. 1 is a perspective view of a container and pallet structure according to the invention;

FIG. 2 is a longitudinal view of the assembly of FIG. 1;

FIG. 3 is a perspective view of a cleat adapted to be used with the container of FIGS. 1 and 2;

FIG. 4 is a view similar to FIG. 3, showing a modified cleat;

FIG. 5 is a side elevational view, partly in section, of a further container and pallet structure according to the invention;

FIG. 6 is a bottom view of the assembly of FIG. 5;

FIG. 7 is a side elevational view of another cleat adapted to be used with the container of FIGS. 1 and 2;

FIG. 8 is a bottom view of a container provided with a pair of cleats of the type shown in FIG. 7;

FIG. 9 is a longitudinal sectional view of a further cleat according to the invention;

FIG. 10 is a perspective view of still another cleat embodying the invention;

FIG. 11 is a perspective view of a group of vessels provided with a pallet structure according to the invention;

FIG. 12 is a perspective view similar to FIG. 1, illustrating still another embodiment; and

FIG. 13 is a perspective view of a modification of the embodiment of FIG. 1.

In FIGS. 1 and 2 I have shown a container 10, in the form of an upwardly open box or crate, with a pair of sidewalls 11, 12 and a bottom 13 of rectangular configuration. It should be noted that, for purposes of the present invention, it is immaterial whether the sidewalls 11 and 12 extend along the major or the minor sides of the rectangle.

Two parallel cleats 20 extend below the bottom 13 to form spaced-apart ribs or legs on which the container can rest and which give access to a fork or tongue of a lifting truck. These cleats are in the shape of prismatic tubes each traversed by an elastic member 30, here shown as a coil spring, with end portions 31, 32 extending upwardly along sidewalls 11 and 12, respectively. At their upper extremities the spring portions 31, 32 terminate in hooks 41, 42 which engage the top edges of walls 11 and 12. The springs 30 are so dimensioned as to be placed under tension by this engagement whereby the cleats 20 are firmly held in contact with the container bottom 13, the resulting friction being usually sufficient to prevent a dislocation of these cleats; if necessary, however, shallow ribs could be formed on the underside of container bottom 13 to ensure correct positioning of the cleats, or the underside of the container could be slightly recessed to receive the cleats as described below in connection with FIG. 12.

In FIG. 3 I have shown a modified cleat 120 with two parallel horizontal bores 121 traversed by respective tension springs 30 (FIG. 2) with projecting ends 31, 32 and hooks 41, 42.

FIG. 4 illustrates a cleat 220 of generally trapezoidal profile forming journals for a pair of casters or wheels 222. A central bore 221 of this cleat accommodates the aforescribed coil spring having terminals 31, 32.

In FIGS. 5 and 6 I show a cardboard box 110 with end walls 114, 115 having integral extensions 114', 115' which are bent into ribs 114'', 115'' taking the place of the cleats 20, 120 and 220 illustrated in the preceding FIGS. Elastic straps 130 pass lengthwise through these ribs and have projecting ends 131, 132 terminating in hooks 141, 142 which reach around the upper edges of sidewalls 111, 112 of box 110. The ribs 114'', 115'' are partly cut away in the middle to leave clearances 116, 117 which together define a channel parallel to the sidewalls 111, 112; thus, tongues or prongs of fork lifts may be introduced optionally between the ribs 114'', 115'' transversely to the walls 111, 112 or at right angles to that direction through the aligned clearances 116 and 117. The exposed portions of straps 130 may be specially shielded if they might otherwise be liable to damage by the lifting equipment. As illustrated in dot-dash lines in FIG. 5, extension 115' (and, similarly, extension 114') may be swung out after removal of its strap 130 to facilitate stacking of several such boxes.

The construction of FIGS. 5 and 6 effectively provides two spaced-apart bosses per cleat to afford four-way access to a lifting implement. The same effect may be had from a cleat 320 (FIGS. 7 and 8) which may have a shape similar to that of cleat 20 or 120 but is additionally provided with two lower bosses 323, 324 defining a channel 325 between them. In the specific embodiment illustrated, the ends of each cleat 320 are provided with pins 333, 334 engaged by respective springs 331, 332 which terminate in hooks 341, 342 for the purpose described, the length of these springs being of course less than

the height of the walls of the associated container 310 in order to create the necessary contract pressure.

According to FIG. 9, a cleat 420 (of any of the profiles previously described) is composed of two juxtaposed metallic, wooden or plastic strips 420', 420'' held together by rivets or screws 426, a fastening member 430 (e.g. a flat strap as shown in FIGS. 5 and 6) being clamped between these strips so as to have its hooked ends 431, 432 projecting therefrom.

FIG. 10 shows a cleat 520 composed of two telescoped sections 520a, 520b which carry respective fastening elements 531, 532 at their ends; these fastening elements may again be in the form of rubber bands, coil springs or the like, as previously described. The telescopic fit of the nested sections enables the length of the cleat 520 to be varied in order to fit containers of different widths.

In FIG. 11 I have illustrated the possibility of joining a plurality of juxtaposed vessels, specifically four drum-shaped receptacles 610, into a single unit by means of surrounding tie straps 651, 652. Cleats 620 have the upper extremities of their fasteners 630 hooked at 641 onto the upper tie strap 651; if a lesser tension of the resilient elements 630 is desired, these elements may be hooked onto the lower strap 652. The profiles of cleats 620 are here shown, by way of example, as generally semicircular.

FIG. 12 represents a container 710 in the form of a closed box whose lid 718 is pressed down by the strap ends 731, 732 having their extremities releasably interconnected by hooks 741 and eyes 742; the cleats 720 are here shown as cylindrical tubes received in shallow arcuate recesses 719 at the bottom of container 710.

FIG. 13 shows an open container 810, similar to box 10 of FIG. 1, whose sidewalls 811, 812 are provided at different levels with projecting studs 853 adapted to receive loop-shaped gripping formations 841 of elastic tension elements

830 extending from cleats 820. These cleats, by way of example, have been given a triangular profile.

It will be understood that the various cleat profiles may be further modified, as required or desired, and that features from different embodiments may be interchanged, to the extent of compatibility, within the scope of my present invention.

I claim:

- 1. In combination, a container with a pair of upstanding spaced opposed sidewalls and a generally flat bottom, a plurality of cleats of a length substantially equaling the spacing of said sidewalls, said cleats being each provided with at least one throughgoing longitudinally extending bore, said container resting with said bottom on said cleats and having said sidewalls in substantial alignment with the ends of said cleats, and fastening means including a continuous elastic member traversing the bore of each cleat, said member having free extremities rising along said sidewalls and detachably engaging said container under tension above said bottom.
- 2. The combination defined in claim 1 wherein said elastic member is a coil spring.
- 3. The combination defined in claim 1 wherein the extremities of said elastic member terminate in rigid gripping formations.
- 4. The combination defined in claim 1 wherein said free extremities are hooks engaging the top edges of said sidewalls.
- 5. The combination defined in claim 1 wherein said sidewalls are provided with projections at different levels selectively engageable by said free extremities.
- 6. The combination defined in claim 1 wherein said container has a pair of end walls of foldable sheet material, said cleats being formed as folded over extensions of said end walls.

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