March 11, 1969 R. M. NAYLOR ET AL 3,431,870

TRAPEZOIDAL PALLET FOR PARTS

Filed March 20, 1967 Sheet 1 of 3

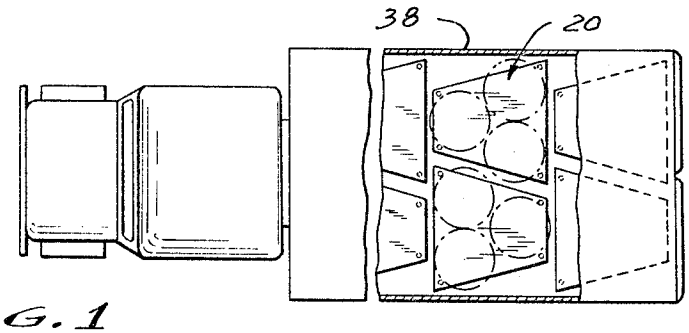


FIG. 1

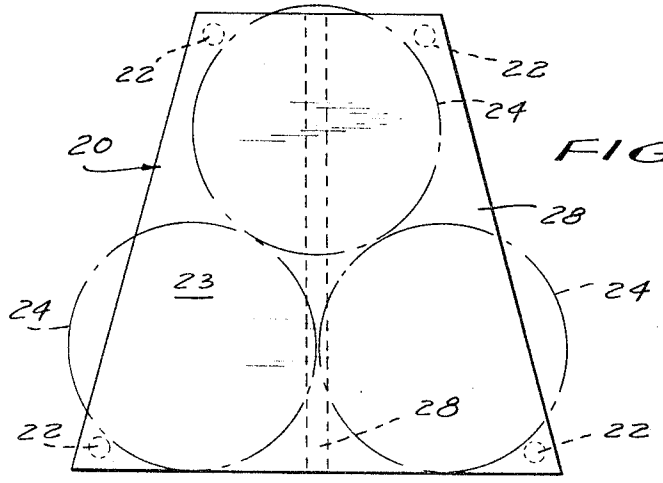


FIG. 2

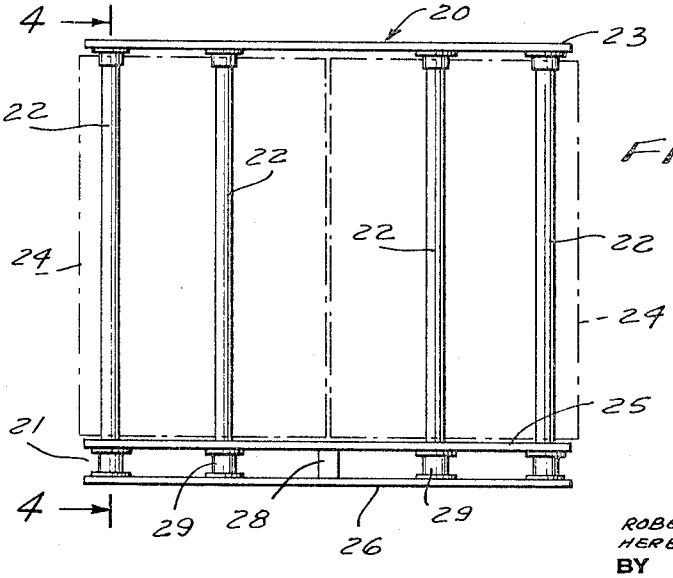


FIG. 3

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Filed March 20, 1967 Sheet 2 of 3

FIG. 5

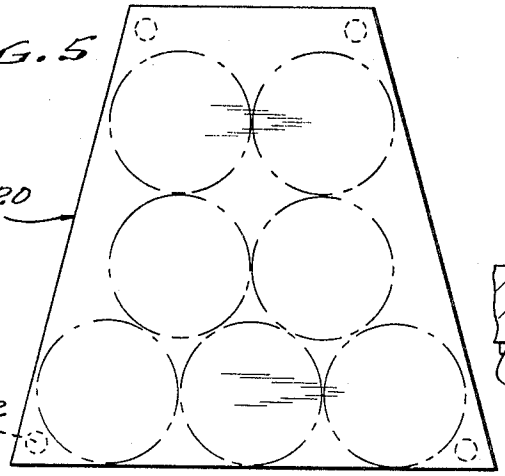


FIG. 6

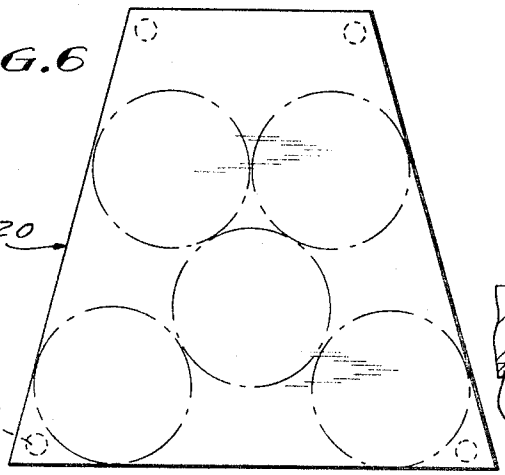


FIG. 7

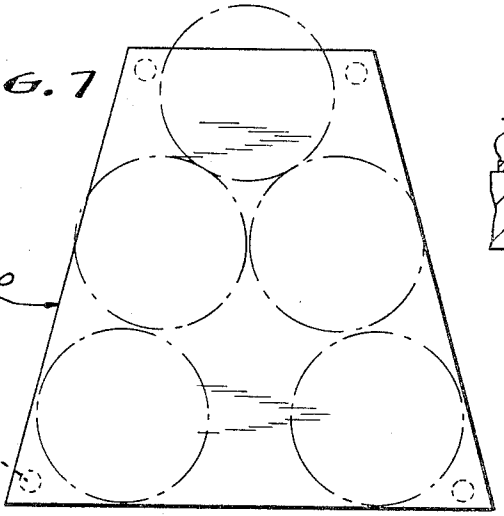
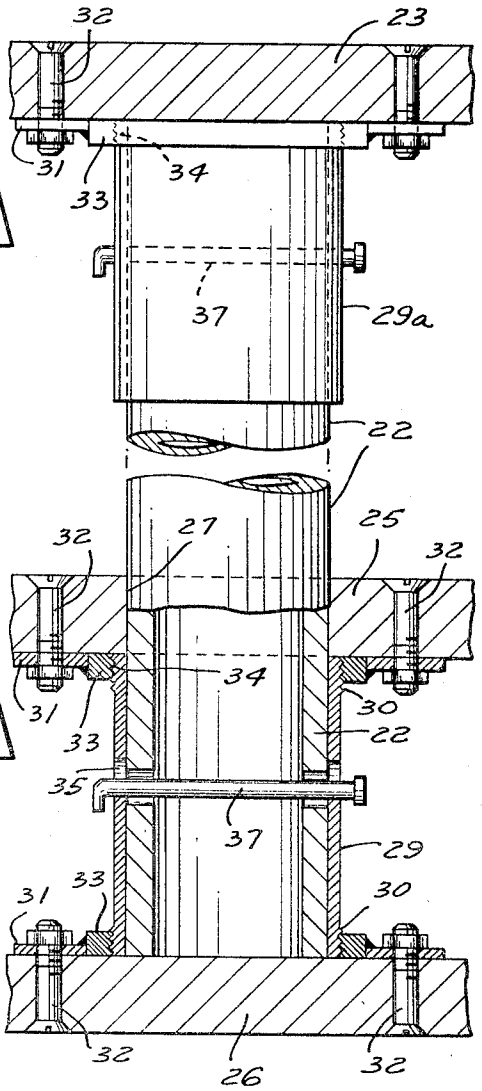


FIG. 4



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March 11, 1969 R. M. NAYLOR ET AL 3,431,870

TRAPEZOIDAL PALLET FOR PARTS

Filed March 20, 1967 Sheet 3 of 3

FIG. 8

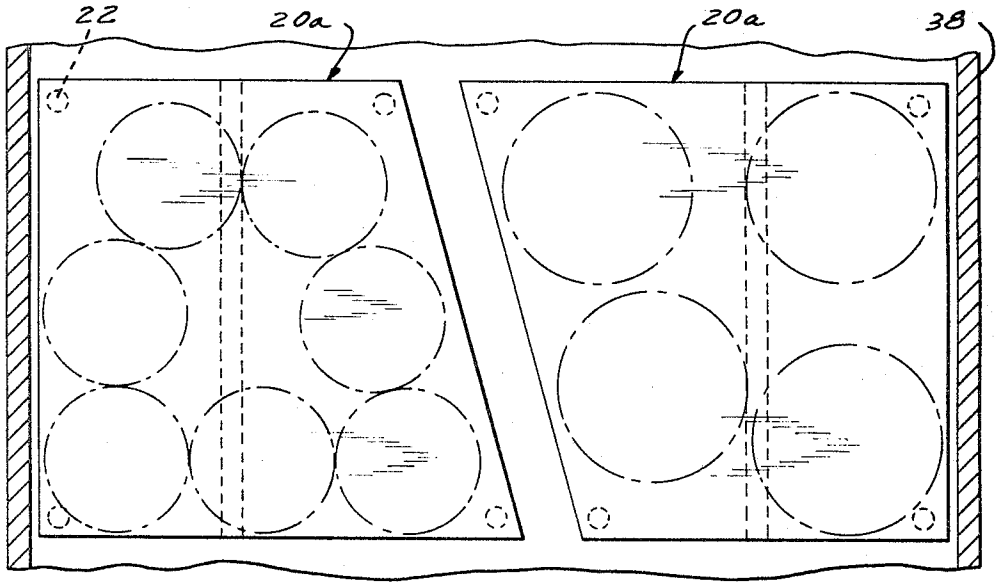


FIG. 9

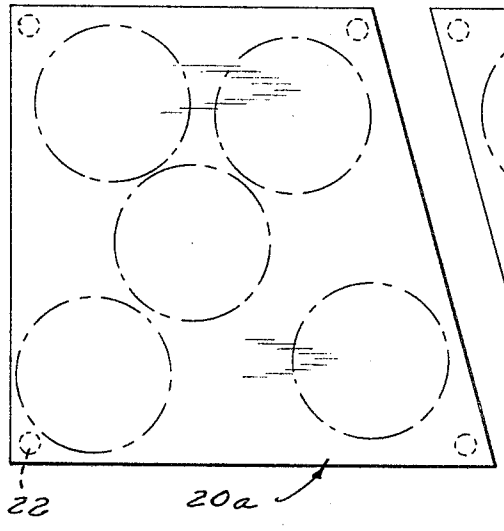
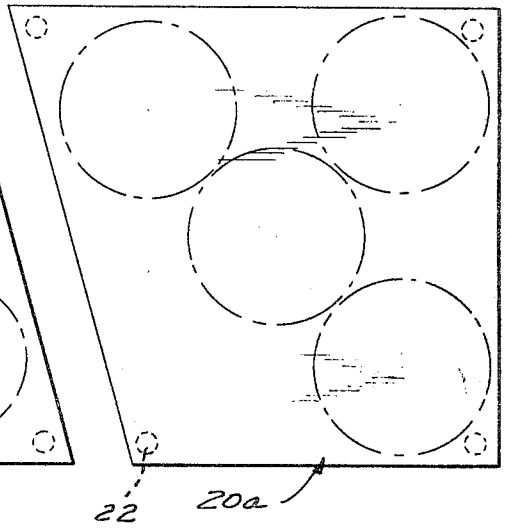


FIG. 10



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3,431,870

TRAPEZOIDAL PALLET FOR PARTS

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U.S. Cl. 108—55 6 Claims
Int. Cl. B65d 19/44

ABSTRACT OF THE DISCLOSURE

A pallet for holding parts during handling, shipping, and storage. The pallet includes a horizontal trapezoidal shaped base and a plurality of upright members resting on the base and extending upwardly therefrom. A trapezoidal shaped cover rests on the upper surface of the upright members and is aligned with the base. Means are positioned on the base and on the cover to retain each of the upright members in fixed position thereby retaining at least one column of parts therebetween to facilitate the handling, shipping, and storage thereof.

Background of the invention

In industry, it is often desirable to ship certain parts to the location of final assembly or to store parts at the point of final use until needed. To facilitate the handling of these parts, pallets are often used. The individual pallets containing a multiplicity of parts can be easily handled by means such as a forklift truck and the like.

However, with existing pallets, when the parts take certain shapes, there is waste space both in shipping and in storage. In particular, when the parts to be shipped are circular, such as drum closures, this problem is of great significance. The drum closures are stacked in a nested manner forming circular columns of closures. The existing pallets are of circular or square configuration and only a minimum number of columns of drum closures can be stacked thereon. In addition, when these pallets are loaded on to a truck for shipping or placed in a storage area, the shape of these pallets when placed next to one another, results in a large amount of unused space. This particular problem is most obvious when a truck is loaded and unloaded. A large amount of available space in a truck is unused thereby increasing the number of trucks needed to transport a given number of parts which obviously will greatly increase the cost of transportation.

In this respect, it will also be noted that a pallet which may be disassembled after a shipment has been made also would provide a large savings in shipping and storage space. The pallets could be disassembled and shipped back to the initial point of shipment in large numbers. Naturally, the disassembling and assembly of these pallets must be accomplished quickly and efficiently. It should be kept in mind that, although the pallet can be easily assembled and disassembled, it should be sturdy so that it will not accidently come apart during shipping and handling.

Summary of the invention

A pallet for holding parts during handling, shipping and storage is provided which includes a horizontal, trapezoidal shaped base and a horizontal, trapezoidal shaped cover aligned with the base, the base and cover being spaced by means of a plurality of upright members which are mounted to both the base and the cover. The base, cover and upright members together form a container for industrial parts. The base is divided into two spaced trapezoidal parts, a top and a bottom, between which a handling device, such as a forklift truck may be placed for use in transporting the loaded pallet. A trapezoidal configuration of the pallet is particularly useful for carrying circular parts such as columns of nested drum closures. As a result of the trapezoidal configuration of the pallet there is a significant savings in shipping space and storage space required for the loaded pallets.

The principal objectives of this invention are provide a pallet for holding parts during shipping and storage which alleviate the above mentioned problems, among others, and, in particular, is of a shape and configuration which facilitates the efficient shipping and storing of parts, particularly circular parts such as columns of nested drum closures. Also, this invention provides a pallet which may be easily assembled and disassembled to facilitate the return of the pallets to the initial shipping point after use for reuse. Means are also provided to insure stability of the pallet during shipping and handling of parts.

Brief description of the drawings

FIG. 1 is a partial sectional top view of a truck carrying a plurality of pallets embodying this invention;

FIG. 2 is a top view of a pallet embodying this invention containing 3 columns of nested drum closures;

FIG. 3 is a side elevation view of thereof;

FIG. 4 is a sectional view thereof taken along the plane of line 4—4 of FIG. 3 with a center portion having been broken away and removed;

FIG. 5 is a top view thereof showing the arrangement of nested drum closures having another diameter;

FIG. 6 is a top view thereof showing the arrangement of columns of nested drum liners having still another diameter;

FIG. 7 is a top view thereof, showing the arrangement of columns of nested drum liners having yet another diameter;

FIG. 8 is a partial sectional top view of a transportation or storage medium containing two pallets of an alternate embodiment of the invention with each pallet showing the arrangement of columns of nested drum liners of different diameters;

FIG. 9 is a top view of a pallet of the alternate embodiment of FIG. 8 showing the arrangement of columns of nested drum liners having still another diameter; and

FIG. 10 is a top view of the alternate embodiment of FIG. 8 showing the arrangement of columns of nested drum liners having yet another diameter.

Description of the preferred embodiments

As shown in FIGS. 2–4, the pallet **20** is comprised basically of three parts. There is a base **21**, upright members **22**, and cover **23**. When these parts are connected, they form a confined shipping area, or container, in which industrial parts may be housed during shipment or storage. Although many different types of industrial parts may be shipped and stored in this manner, the handling of circular drum closures are of primary concern. These drum closures, **24**, are generally stacked in a nested vertical fashion as depicted in FIG. 3. Drum closures **24** rest on base **21** of pallet **20**, and are held in position on the pallet by upright members **22** and cover **23**.

Base **21** of pallet **20** includes a horizontal top portion **25**, and a horizontal bottom portion **26**. Top portion **25** and bottom portion **26** may be formed of any common supporting material, for example, plywood. Both top portion **25** and bottom portion **26** are trapezoidal in configuration and are similar in shape so that the sides of both parts may be aligned.

Cover 23 may be formed of the same material as top portion 25 and bottom portion 26 and is also similar in shape and trapezoidal configuration so that it may be vertically aligned with base 21. Cover 23 is kept in spaced relationship to base 21 by means of upright members 22. Vertical upright members 22 may be formed of any rigid material such as black iron pipe. Cover 23 rests on the upper surface of upright members 22, which in turn extend through bores 27 in upper portion 25 and rest on bottom portion 26 of base 21. As depicted, four upright members 22 have been found to be satisfactory for retaining the columns of nested drum closures, 24, on pallet 21 during shipment and storage. They are placed adjacent to each of the four corners of pallet 21. A support bar 28 extends along a centrally located axis of pallet base 21 between bottom portion 26 and upper portion 25. Support bar 28 lends additional support to pallet base 21 so that it may safely support the columns of drum closures 24.

Naturally, upright members 22 must be connected to base 21 and cover 23 so that they will not be displaced by shifting drum closures 24; and in FIG. 4 an attachment is shown accomplishing this end. A nipple 29 surrounds the entire surface of support member 22 which is between upper portion 25 and lower portion 26 of base 21. Each support member 22 is in sliding relationship to nipple 29 so that it may be vertically removed if desired. Nipple 29 may be formed of a similar material as support member 22 such as black iron pipe. Nipple 29 has a threaded outer surface portion 30 on both its upper and lower ends.

A plate 31 is fastened to the underside of top portion 27 and another plate 31 is fastened to the upper side of bottom portion 26. Bolts 32 serve as an adequate fastening means. A cylindrical flange 33 is welded to each plate in the base. Flange 33 has a threaded bore 34 which will engage with a threaded portion 30 of nipple 29. In this manner, nipple 29 is fastened to both top portion 25 and bottom portion 26 of pallet base 21. Therefore, when an upright member 22 is placed within a nipple 29, its only possible movement will be in an upward, vertical direction and before it can be displaced from base 21, it must be moved the entire distance between bottom portion 26 and top portion 25.

Cover 23 is fixed on the top of upright member 22 in a similar manner. However, a nipple 29*a* is used having a threaded outer portion 30, adjacent only its upper surface. In a similar fashion to base 21, a flange 33 is welded to a plate 31 which in turn is bolted to cover 23. The threaded bore 34 of flange 33 is interengaged with threaded surface 30 of nipple 29*a*. This holds nipple 29*a* to cover 23. Nipple 29*a* is in sliding engagement with the upper portion of upright member 22, and when placed thereon forms a fixed cover for pallet 21. Before cover 23 can be displaced from the top of upright members 22, it must be displaced a distance equal to the length of nipple 29*a* which would take a considerable force.

However, in order to insure against displacement of cover 23, directly due to violent motion during transportation of the loaded pallets, a locking pin 37 may be inserted through each nipple and support member combination to prevent support members 22 from coming out of nipples 29 or 29*a*. Two diametrically opposed openings 35 would be provided in each nipple 29 and corresponding diametrically opposed openings 36 would be provided in support member 22. Openings 35 and 36 would be positioned so that they may be aligned when support member 22 is placed within nipple 29. Locking pin 37 would then be inserted and may be shaped that when it is rotated 180° it cannot be displaced and subsequently when it is rotated another 180° it can be removed. Other common locking means may be employed such as the use of a hook extending from the base or cover portions which would be positioned in openings in the nipple and upright members to lock the upright members in position. When such a locking device is used the pallet and cover are positively retained in position thereby retaining the columns of nested drum closures 24 in position.

When it is desirable to unload pallet 20, locking pin 37 may be rotated and removed. Then cover 23 may be removed from upright members 22 which in turn may be removed from pallet base 21. The drum closures are then removed and the pallet may be returned to the original shipping position in disassembled form. This results in a great saving in shipping space.

One purpose of the top and bottom portions of base 21 is to provide a handling space for handling means such as a forklift truck which may be inserted therebetween and the pallet easily lifted and transported to a new location.

The locking pin may be fastened by a chain to each nipple so that it will always be available for reassembly of the pallet. Whatever means is used as a locking device, whether a pin, a hook arrangement or other means, it will be satisfactory if it is uncomplicated, always available and able to stand abuse. It must provide a reasonable degree of tension on the columns of nested drum closures.

The inherent trapezoidal shape of pallet 20, allows the maximum use of square footage required for certain parts, particularly objects of circular cross section. In FIG. 2 and in FIGS. 5–7, it can be seen how columns of nested drum closures having different diameters could be placed within pallet 20 to provide the most effective utilization of space. The manner in which trapezoidal pallet 20 can be loaded within a trailer truck is shown in FIG. 1. The trapezoidal dimensions are such that when the pallets are placed in opposite direction in truck loading, a pair of pallets will fit comfortably in the interior width of the truck. Generally two tiers of pallets will fit within a truck. Therefore, with this effective utilization of space, there will be a tremendous savings in transportation costs and in unloading costs. A great many more drum closures can be shipped in one truck and the ease of loading and unloading greatly reduces the time required and ultimately the cost.

Being able to store the trapezoidal pallet side by side in the truck also carries over to the storage of these pallets in a storage area. The maximum amount of square footage is utilized per storage area. For instance, in plants where the suggested drum closures would be used, the pallets could be stacked in three layers. The efficient utilization of space of the trapezoidal pallet serves to cut space requirements approximately in half.

An alternate embodiment of the pallet is shown in FIGS. 8–10, and is designated as 20*a*. In this embodiment, one of the non-parallel sides of the trapezoidal shaped pallet is perpendicular to the parallel sides. This provides an increase in the amount of surface area per pallet and in addition maintains the trapezoidal configuration of the pallet to facilitate the shipping and storage of pallets in adjacent position. This alteration in trapezoidal configuration shows that various embodiments of this invention are possible and the embodiment most useful will depend upon, among other things, the particular shipping means or storage space being used to obtain the best results.

Thus, among others, the several aforenoted objects and advantages are most effectively attained. Although two somewhat preferred embodiments of the invention have been illustrated and described in detail herein, it should be understood that this invention is in no sense limited thereby and its scope is to be determined by that of the appended claims.

We claim:

1. A pallet for holding parts during handling, shipping, and storage which comprises: a horizontal trapezoidal shaped base, a plurality of upright members resting on said base and extending upwardly therefrom, a trapezoidal shaped cover resting on the upper surface of said upright members and being aligned with said base, means on said base and on said cover to retain each of said up-

right members in fixed position thereby retaining at least one column of parts therebetween to facilitate the handling, shipping, and storage thereof, said base including a trapezoidal shaped bottom portion and a trapezoidal shaped top portion with a plurality of holes therein, said top portion being spaced from said bottom portion and aligned therewith, said upright members resting on said bottom portion and extending through the holes in said top portion and extending upwardly therefrom, said means on said base and cover to retain each of said upright members in fixed position including a first nipple slidably mounted on each upright member and surrounding the outer surface of said upright member between the bottom and top portions of said base, said first nipple being threaded on its outer surface portion adjacent its upper and lower ends, a first fastening plate mounted on the top portion of the base and having a threaded bore therein which interengages with the threaded upper outer surface portion of said first nipple, a similar second fastening plate mounted on the bottom portion of said base and having a threaded bore therein which interengages with the threaded lower surface portion of said first nipple, a second nipple surrounding the upper portion of said upright member in sliding relationship thereto and having a threaded upper outer surface portion, and a third fastening plate mounted on said cover and having a threaded bore therein which interengages with the upper outer surface portion of said second nipple thereby retaining each of said upright members in fixed position.

2. The invention in accordance with claim 1 wherein a locking means is provided to lock each of said upright members in position.

3. The invention in accordance with claim 2 wherein said locking means comprises; said first nipple having a pair of diametrically opposed holes therein, said upright member having a first pair of diametrically opposed holes aligned with the holes in said first nipple, a removable locking pin inserted through said aligned holes to positively prevent said upright member from vertically sliding relative to said first nipple, said second nipple having a pair of diametrically opposed holes therein, said upright member having a second pair of diametrically opposed holes alinged with the holes in said second nipple, and a second removable locking pin inserted through said aligned holes to positively prevent said upright member from vertically sliding relative to said first nipple thereby providing a means to lock said upright member in position.

4. The invention in accordance with claim 1 wherein a support bar is positioned along a horizontal centrally located axis of said base between the top and bottom portions thereof to provide additional support for the top portion of said base when one or more columns of parts are resting thereon.

5. A pallet for holding parts during handling, shipping, and storage which may be readily assembled and disassembled and which comprises: a horizontal trapezoidal shaped base, a plurality of upright members resting on said base and extending upwardly therefrom, a trapezoidal shaped cover resting on the upper surface of said upright members and being aligned with said base, means on said base and on said cover to retain each of said upright members in fixed position when assembled thereby retaining at least one column of parts therebetween to facilitate the handling, shipping, and storage thereof, locking means associated with said pallet to lock each of said upright members in position when said pallet is assembled, said locking means being easily removable to facilitate disassembly of said pallet after use, surfaces on said upright members and said base and surfaces on said upright members and said cover forming at least one set of aligned keyways when said pallet is assembled, and said locking means including a removable locking pin insertable in each set of said aligned keyways and then shiftable to a locked position to lock said pallet in the assembled position and shiftable to an unlocked position so as to be easily removable from said pallet thereby facilitating the disassembly of said pallet after use.

6. The invention in accordance with claim 5 wherein one of the non-parallel sides of each of the trapezoidal parts of said pallet forms a right angle with the two parallel sides.

References Cited

UNITED STATES PATENTS

2,226,294	12/1940	Erickson	108—51
2,443,684	6/1948	Lazzarus	108—53 XR
2,523,271	10/1950	Bartel	108—55
2,579,685	12/1951	Loose	108—53
2,662,710	12/1953	Lapham	108—52
2,828,933	4/1958	De Pew, et al.	108—55
2,924,339	2/1960	Skubic	108—53
3,207,095	9/1965	Hiatt	108—53
3,208,606	9/1965	Epstein	108—55 XR

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