A pallet is described which is to be used for handling and transporting shipping drums, such as fiber drums, steel drums or barrels by fastening the pallet to the base of the drum. The pallet is of just sufficient size to accommodate a single drum. The drum is filled and transported while maintaining it secured to the pallet at all times. The pallet includes a circular extension, comprising a ring of strip material adapted to fit telescopically over the lower end of the drum and a plurality of horizontally disposed legs fastened rigidly to the ring.

4 Claims, 11 Drawing Figures
PALLET FOR HANDLING SHIPPING DRUMS

This application is a continuation of application, Ser. No. 698,898, filed Jan. 18, 1968, now abandoned bearing the same title, which, in turn, is a continuation-in-part of my prior application, Ser. No. 673,609, filed Oct. 9, 1967, now U.S. Pat. No. 3,521,771.

This invention relates to a pallet for handling shipping drums.

Shipping drums such as fiber drums, steel oil drums and barrels are characteristically difficult to handle, not only because of their cylindrical shape but also because there are no extensions or handles by which they can be lifted. Even if handles were provided, their weight would make manual handling impractical. Accordingly, it is the present practice to handle shipping drums of this kind in one of two ways. The most common method is to place four such drums on a wooden pallet of the type having a rectangular horizontally disposed spaced-apart upper and lower surface connected together by wooden spacers. After the drums are filled, from two to four of the drums are lifted or slid onto the pallet by hand. A lift truck is then employed for lifting the pallet upon which the drums rest to a truck or railroad car where they are transported to the desired location. The drums are then removed from the pallet and unloaded by hand. If they contain solid materials such as metal castings, they must be inverted. This is a particularly difficult and time-consuming operation when the drums are heavily loaded. After the drums have been removed, the pallets are separately handled and stored. The drums are then returned or reused either by themselves or in conjunction with the pallets upon which they were initially shipped.

This method of handling shipping drums has a number of disadvantages, the primary one being the requirement for manual handling when the drums are loaded onto or removed from the pallets and the requirement for handling and shipping of the pallets separately. Moreover, because it is possible for the drums to slide about on the pallets this method of handling produces a safety hazard and it is not usually practical to stack the drums in tiers one above the other.

In another method used for handling shipping drums of the type under consideration, a pair of clamp arms mounted upon a lift truck are provided with jaws of the proper shape to fit the drum. After the clamp engages the drum, the lift truck is used to transport the drum to the vehicle used for carrying it to the desired destination. While this method of handling drums is entirely satisfactory in many cases, it is sometimes prohibitive or expensive and inconvenient to use clamps because the trucks are required for performing other operations. Furthermore, the drums cannot be reliably stacked one above the other. For these and other reasons, prior methods employed for handling and shipping drums of the type described have not been entirely satisfactory.

It is thus a primary object of the present invention to provide an improved method for handling and transporting shipping drums such as fiberboard and steel drums.

Another more specific object of the invention is the provision of an improved method for transporting shipping drums which will enable the drums to be quickly and easily handled by means of fork lift trucks and stacked one above the other in vertical alignment.

A further object of the invention is the provision of an improved method of handling and transporting shipping drums without the necessity for manually lifting the drums and placing them on pallets either before they are filled or when they are emptied.

A still further object of the invention is the provision of an improved method for handling shipping drums of the type described in which drums can be easily loaded and unloaded from the forks of a standard fork lift truck and can be placed in closely spaced adjacent relationship without the pallet of one drum coming into contact with another.

A further object of the present invention is the provision of an improved drum pallet which is inexpensive to construct, adapted to reliably support a single drum and capable of being constructed with a minimum of parts.

These and other more detailed and specific objects will become apparent in view of the following specification and drawings wherein:

FIG. 1 is a central vertical sectional view of a shipping drum pallet in accordance with the invention.

FIG. 2 is a bottom view of the pallet of FIG. 1 on a somewhat reduced scale.

FIG. 3 is a partial side elevational view partly in section of two shipping containers to which a pallet in accordance with the invention is secured.

FIG. 4 is a greatly enlarged partial vertical sectional view of the lower edge of one of the shipping drums showing the upper portion of the pallet in its engaged position adjacent the bottom of the drum.

FIG. 5 is a side elevational view partly broken away of another embodiment of the invention.

FIG. 6 is a plan view of a plurality of shipping drums being transported in accordance with the invention.

FIG. 7 is a partial central vertical sectional view of a pallet in accordance with another embodiment of the invention.

FIG. 8 is a plan view of another form of pallet.

FIG. 9 is a front elevational view of the pallet of FIG. 8.

FIG. 10 is a perspective view of the pallet during use.

FIG. 11 is a partial elevational view of the stacked drums utilizing the invention.

To the accomplishment of the foregoing and related ends this invention comprises the features hereinafter fully described and particularly pointed out in the claims, the following description setting forth in detail certain illustrative embodiments of the invention, these being indicative, however, of but a few of the various ways in which the principles of the invention may be employed.

A preferred method of practicing the invention will now be described. As a first step in practicing the invention, the shipping drums whether they be fiber drums, steel drums or barrels are mounted upon a supporting pallet of just sufficient size to accommodate a single drum. The construction of the pallet itself will be described more fully below. At this point it is sufficient to say that the pallet is provided with a drum engaging support on its upper surface and the base of the drum is placed on the drum engaging support, preferably with the base of the drum telescopically connected to the pallet to prevent lateral sliding movement of the pallet relative to the drum. The telescopic connection can be formed either by a flange at the bottom of the drum extending downwardly over the top of the pallet or, in the alternative, a circumferentially distributed vertically projecting extension on the upper edge of the pallet that projects upwardly over the side edges of the drum.

The pallet is then fastened to the drum by securing the upper edge of the pallet to the lower edge or base of the drum. This can be accomplished in a number of ways such as for example by welding or by deforming the portions of the pallet adjacent the drum so as to provide overlapping tabs that extend inwardly over the chime or bead at the bottom of the drum and thereby securely grip the base of the drum. In the alternative, mechanical fasteners such as screws, bolts or clamps can be provided for this purpose. The connection between the drum and the pallet need not be a rigid one so long as it prevents the drum from being removed.

The drums with the pallets secured to them are filled in the usual way either manually or with automatic equipment. At this point they are ready for shipment. The drums are then lift by means of the lift truck forks and are carried by a fork lift truck to a vehicle where they are transported to their destination. During this time the pallets remain fastened to the drum. Once the drums reach their destination, they are removed from the vehicle and emptied with the pallets remaining secured to the drums at all times. The drums are then cleaned if necessary in the usual way with the pallets secured to them. They are refilled with the pallet still secured to them. The drums are thus used with the pallets normally remaining permanently attached to them throughout their lifetime.
The invention is based partly on the recognition that the utility of a shipping drum can be greatly increased by permanently securing to it a small pallet of just sufficient size to accommodate a single drum and maintaining the pallet at all times secured to the drum throughout filling, shipment, emptying, refilling. While it is possible to utilize pallets in accordance with the invention without fastening the pallets in place on the drums as described herein, the drums will remain in position on the pallets solely as the result of their own weight. This has the disadvantage of the drums becoming inadvertently separated from the pallets or falling off the pallet during shipment.

Refer now to FIGS. 1 - 7. FIGS. 1 - 4 illustrate one form of pallet embodying the present invention. The pallet which is designated 10 includes an upper drum engaging element 12 and a pedestal 14 joined together by a circular post 16 formed from a hollow ring of sheet metal welded at its upper and lower edges to the engaging element 12 and pedestal 14. The edge portions of the supporting element, pedestal and the centerpost 16 define an annular recess 17 into which the forks of the lift truck extend when the pallet is to be lifted off the ground. The free edges of the supporting element and pedestal define fork engaging surfaces 20 and 26 respectively.

The periphery of the element 12 is bent downwardly to provide a circumference extending downwardly projecting circular flange 18 which serves both to locate and position the pallet within the recess at the bottom of the drum as well as to rigidify the upper supporting element 12. In the event that the flange 18 is of sufficient length to extend below the lower end of the drum, its lower edge 20 will comprise an upper supporting surface. If, on the other hand, the flange 18 is shorter than the lower flange of the drum, the lower edge of the drum will serve as an upper supporting surface.

The supporting element 12 is formed from sheet metal having a dome shape with the apex of the dome projecting downwardly. The lower supporting plate 14 is similarly domed but in the opposite direction (with the apex of the dome projecting upwardly). This provision has two advantages. First, it rigidifies the sheet metal and secondly it allows the drum engaging element 12 to fit securely within the lower portion of the drum.

The lower pedestal 14 is also preferably reinforced by means of circumferentially spaced radially extending reinforcing ribs 28 in this case formed by stamping in the pedestal 14.

As seen in the figures, the periphery of the pedestal 14 is turned downwardly to provide a circumference extending downwardly projecting cylindrical flange 24 similar to the flange 18 of the element 12. The flange 24 provides several important functions. First, it reinforces the pedestal 14 thereby making the plate more resistant to damage. Second, it provides a flat supporting surface for the pallet when the pallet is placed on the ground. Third, it provides a cylindrical recess adapted to fit over the top of a drum as will be described more fully in connection with FIG. 3. The flanges 18 and 24 can be continuous or interrupted, i.e., a series of tabs, but the latter construction will not provide as much reinforcement.

The center of the plate 14 has suitably secured to it, e.g., by welding, a supporting element such as a tube 30. The bottom of the tube 30, it will be noticed, is normally elevated slightly above the bottom edge of the flange 24, but as the weight of the load resting on the pallet presses downwardly on the pallet, the center of the pallet will be deflected downwardly a short distance and the supporting member 30 will contact the ground. This provision assures that the center of the pallet will be adequately supported but prevents the pallet from being unstable when placed on the ground as it would be if the supporting element 30 projected below the flange 24. While the pallets can be formed from many materials, I have found that ¼ inch thick sheet metal steel metal is satisfactory.

Refer now particularly to FIG. 3 which shows the pallet 10 as it appears when being used. As shown in the figure, the element 12 is inserted into the recess at the bottom of a steel drum 32. The recess is formed by downward extensions of the side wall 34 of the drum and a downward circular extension of the bottom wall 36 of the drum which is cramped to the side wall 34 being folded outwardly and back upon itself at 38 (FIG. 4). It should be noted that since the upper plate 12 is recessed within the drum 14, it is only the lower edge of the drum at the seam 38 that is engaged by the upper edge of the fork. In this manner the pallet itself is protected from damage.

The pallet 10 can be secured to the drum 32 in a variety of ways, for example by welding as shown at 40 in FIG. 3 or in the alternative by bending a portion of the lower edge of the flange at the base of the drum 32 inwardly as shown in FIG. 4. This can conveniently be done by first inserting the upper end of the pallet and then hammering the lower edge of the drum seam centrally at three or four places about its circumference. The latter form of connection has the advantage of being semi-permanent and it is a simple matter to remove the pallet by placing a wrench or other tool over the bent-in sections of the drum chime and bending them outwardly to their original position. Welding 40 is preferred where a more permanent connection is desired. The pallets 10 can, in this manner, be removably secured to the drums without the requirement for fasteners which, if present, would add to the cost of the equipment.

As can be seen in FIG. 3, the forks 42 and 44 of a lift truck (not shown) are inserted in the annular recess 17. Their upper surfaces will contact the upper fork engaging surfaces defined in this instance by the lower edge of the drum 32. The lower surfaces of the forks will at times contact the lower fork engaging surfaces defined by the upper edge of the pedestal 14. It can be seen that the recess 17 has sufficient height to accommodate the thickness of the forks 42 and 44 and that the centerpost 16 is of an appropriate diameter to fit between the forks 42 and 44. It can also be seen that since the recess 17 is circular, the forks 42 and 44 can enter the recess from any direction, i.e., from any side of the drum and no special effort is received on the part of the fork lift truck operator to position the truck prior to moving the forks to the engaged position.

The flange 24 is of a slightly larger diameter than the flange 18. In this way the flange 24 will just fit over the top of the drum 32 of a same size as the drum to which the pallet is secured. A substantial number of the drums 32 can therefore be stacked one on top of the other without any danger of the pile falling over.

It will also be noted that downwardly turned edge 24 of the pedestal 14 will place the lower edge of the recess 17 at the proper height above the floor so that the tip of the forks as they slide across the floor will easily enter the recess 17 without being elevated above the floor. The pallets can thus be picked up without the requirement for vertical placement of the forks.

Refer now to FIG. 5 which shows a modified form of the invention. In this form of the invention is provided a portable storage and shipping drum 40 including an upper seamed edge 42, vertically disposed flat side walls 44, 46, 48 and 50 and a flat bottom wall 50. Welded to the bottom wall 50 is a post 52 formed from a sheet metal and positioned approximately in the center of the walls 50. At the lower edge of the post 52 is welded a pedestal 54 which together with the post 52 and the bottom wall 50 defines a pallet having an annular recess 53 in all respects similar to the recess 17 of FIGS. 1 - 4 and having upper and lower fork engaging surfaces defined by the edges of the wall 50 and the edges 56 of the pedestal 54. The periphery of the plate 54 is turned downwardly to provide a peripheral downwardly extending rectangular flange 60 which serves as a support when the pallet is placed on the ground as well as providing a recess which will fit telescopically over the top edge 42 of another one of the drums 40 when they are stacked. A central support element 60 which can consist of metal tubing is welded at its upward edge to the center of the plate 54.
Refer now to FIG. 6 which illustrates the method of handling several of these drums and pallets simultaneously. As seen in the figure, the forks 70 and 72 have a somewhat greater length than those which are normally used. These forks are placed at the appropriate distance from one another to fit within the recesses 53 of each pallet. In this case three of the drums are shown being transported by a single lift truck.

Refer now to FIG. 7 which shows a modified form of pallet in accordance with the invention. The pallet 80 is similar in all respects to the pallet 10 except that the upper supporting plate 82 is provided with an upwardly extending circular flange 86 rather than a downwardly extending flange. The upper plate 82 in this instance connected to a hollow tubular supporting post 94 in any convenient manner as by welding. The lower edge of the post 94 is similarly rigidly secured to a lower supporting plate 90 having a downwardly extending circular peripheral flange 92 with a lower edge 88 which serves as a support when the pallet is placed on the ground. The diameters of the flanges 86 and 92 are equal and are of an appropriate size to just fit over the lower and upper edges respectively of one of the drums 32. If a permanent connection is to be made between the pallet and the drum, the upper edge of the flange 86 is welded to the outside surface of the drum wall 34.

Refer now to FIGS. 8 - 11 which illustrate another form of the invention. A designated pallet 100 is made of just sufficient size to accommodate a single drum. The pallet 100 includes in its construction a drum engaging and supporting member or ring 102 formed from a suitable material such as angle iron having a vertically disposed flange 104 and a horizontally disposed flange 106. The angle iron has been bent into a circular shape and is welded to itself at 108. The flange 104 as seen in the figure fits telescopically over the base of a steel drum 130. It is the telescopic connection between the drum engaging member 102 and the base of the drum that prevents lateral sliding movement between the drum and the pallet. Secured to the bottom of the drum engaging member are two supporting legs 110 and 112 formed from metal tubes secured at 114 to the drum engaging element in parallel relationship and each is positioned inwardly a slight distance from the opposite sides of the drum engaging element 100. Secured to the lower surface of the legs 110 and 112 at their ends are cleats 116, 118, 120 and 122 which extend downwardly a short distance for the purpose of retaining the pallet 100 and the drum supported thereon securely in position on the top of a similar drum as seen in FIG. 11 when the drums are placed in stacked relationship as will be described more fully below. It should be noted that the length of each of the legs 110 and 112 is slightly less than the diameter of the drum engaging ring 102. The legs will therefore not interfere with one another when drums are tightly stacked in side-by-side relationship. At the same time, however, the cleats secured to the base of the legs will prevent the drums above from sliding relative to the drums below when they are stacked. In addition, the cleats act as pedestals when the drums are placed on the floor thus holding the drums above the floor so as to promote better drainage and reduce rust damage.

When the pallet 100 is to be used, the forks 124 and 126 of a lift truck (not shown) are placed between the legs 110 and 112. The pallet 100 and the drum 130 can then be lifted and transported to the desired location. The drum 130 has an opening 134 at its upper end. The lower portion or base of the drum 130 is placed within the drum engaging element 102 with the vertical flange 104 extending upwardly over the adjacent to but spaced from the lower edge of the container 130 and slightly above the chime 139 (FIG. 11). The pallet 100 is then secured to the base of the drum in any suitable manner. One preferred method of securing the pallet to the drum consists of placing a tough sheet of a resilient material such as a reinforced rubber sheet 140 between the flange 104 and the side wall of the drum 130. Segments 142 of the flange 104 are then bent centrally (FIGS. 10 and 11) to thereby tightly compress the sheet 140 against the side of the drum with the upper edge of the segments 142 overlapping the upper edge of the chime 139. In this way the base of the drum 130 is securely fastened to the upper edge of the pallet 100 and the overlap connection between the bent portions 142 and the chime 139 will reliably prevent the removal of the drum from the pallet. Moreover, the resilient material between the flange and the side wall of the drum will protect the base of the drum from damage when the pallet is attached.

In accordance with the invention, the drum pallet 100 can be used as a temporary pallet but is preferably employed as a permanent drum base that makes it possible for the drum to be easily handled and stored with a conventional fork lift truck.

It is important to note that the connection between the drum and the pallet is located at the base of the drum and is a direct connection with the pallet. Thus, unlike metal strapping the connection is not subject to damage nor will it obstruct the opening in the drum. It is apparent that many modifications and variations of this invention as hereinbefore set forth may be made without departing from the spirit and scope thereof. The term "shipping drum" is intended to include fiber and steel drums and barrels.

I claim:

1. A low cost pallet of simplified construction for receiving and transporting common fiber or metal shipping drums, said pallet comprising a circular drum-engaging ring, said ring comprising at least one piece of elongated strip material having a circular, vertical web and a circular horizontal web integral with the vertical web, said ring being of just sufficient size to accommodate a single drum, said vertical web being constructed and arranged to fit telescopically over the base of the drum, a plurality of elongated horizontally disposed legs rigidly secured to the lower surface of the ring, said legs being related to one another in such a way as to define openings below the ring into which the forks of a lift truck can be inserted, said legs being held together solely by the rigid connection between them and the drum engaging ring and cleats on the lower surface of the legs defining a recess for receiving the upper end of one of the drums for preventing the drums on top from sliding off of the upper edge of the drum engaged by the cleats.

2. The apparatus according to claim wherein the legs comprise parallel tubes.

3. The apparatus according to claim wherein the legs comprise parallel elongated elements having a length just slightly shorter than the diameter of the drum engaging element to thereby enable the pallets to be placed adjacent one another without the legs coming into contact.

4. The apparatus according to claim wherein said cleats are provided at each end of each of the legs and extend downwardly therefrom to overlap and prevent lateral sliding movement between the pallet and a drum positioned beneath the pallet and between said cleats.

* * * * *