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SHIPPING DRUM PALLET WITH ANNULAR FORK RECEIVING MEANS

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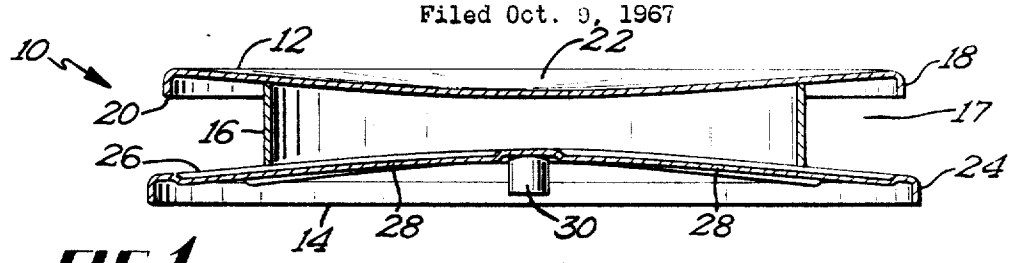


FIG 1

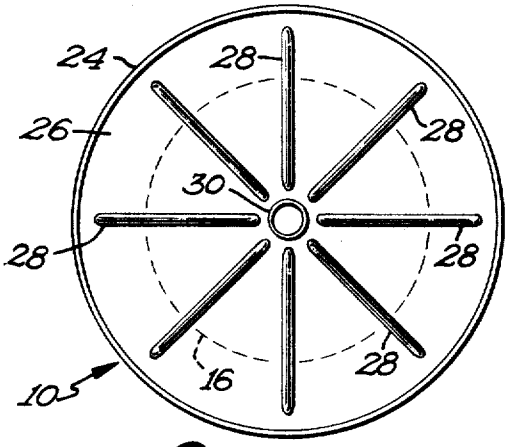


FIG 2

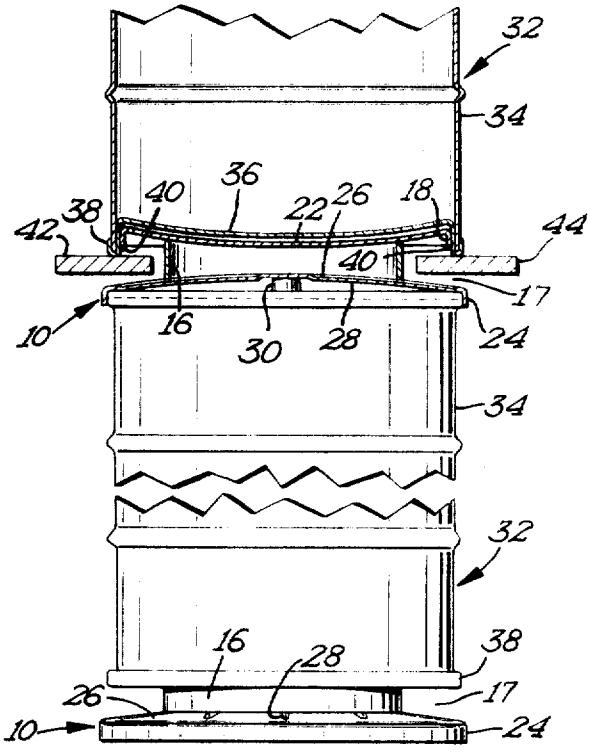


FIG 3

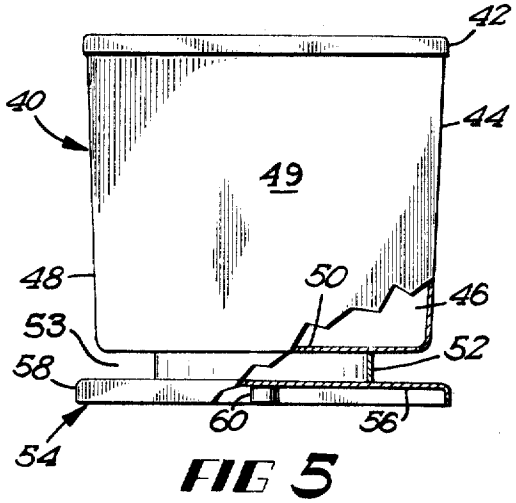


FIG 5

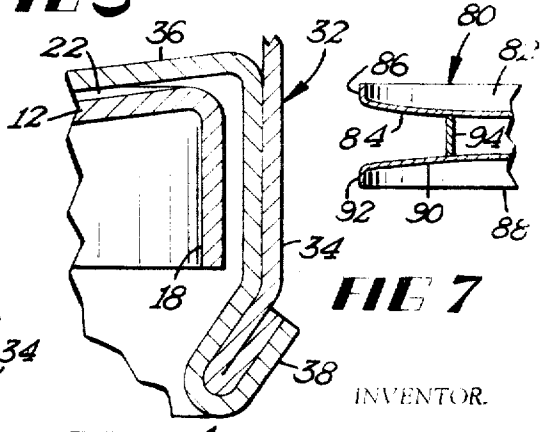


FIG 7

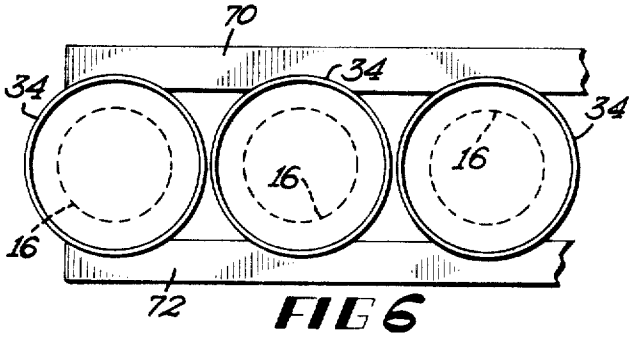


FIG 6

FIG 4

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SHIPPING DRUM PALLET WITH ANNULAR FORK RECEIVING MEANS

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U.S. Cl. 214—621 2 Claims

ABSTRACT OF THE DISCLOSURE

A pallet for facilitating the handling of shipping containers such as steel drums with a fork lift truck including in its construction an upper drum engaging element which is fastened to the bottom of the drum and an annular horizontally disposed recess below the drum engaging element to receive the forks of the lift truck from any side of the drum. Below the annular recess is provided a base which is preferably of just the proper size to fit onto the top of a similar drum to facilitate stacking.

The present invention relates to materials handling equipment and more particularly to a pallet for large, rigid containers such as metal shipping drums, fiber drums, open-mouth portable steel bins and similar containers hereinafter referred to collectively as "shipping drums." The invention is particularly useful in connection with fifty-gallon steel shipping drums.

A great variety of specially designed containers have been used for storing materials such as minerals, chemicals, metal parts, waste products and scrap that are handled with fork lift trucks. In a typical operation, the container is carried to a loading location by means of a lift truck. It is then filled. Next, the lift truck carries the filled container to a storage location or places it in a railroad car or truck. The filled container is then transported to a remote location where another lift truck unloads it. The container is then inverted (frequently by hand) to remove its contents. Containers used for this purpose are specially constructed and include in their construction a suitable provision such as parallel metal bars or plates that extend downwardly from the floor of the container to receive the forks of the lift truck which are inserted between the parallel plates when the container is to be transported. These containers are difficult to load since they must be approached from just the proper direction in order for the forks to enter properly between the plates. Moreover, they are complicated in construction and accordingly are relatively expensive to fabricate.

The present invention is particularly well suited for use in conjunction with conventional steel shipping drums. Steel shipping drums have come into general use in this country and are mass produced on such a large scale that they are relataively inexpensive. Moreover, they have a long life expectancy and are readily available. They are water impervious and the tops can be easily sealed thus making them suited for both indoor and outdoor storage of a variety of products. In spite of these advantages, steel shipping drums have certain shortcomings. They must be grouped together and placed on a rectangular pallet in order to be transported from one location to another with fork lift truck handling equipment. This requires that they be lifted from the floor manually, an operation which is both time-consuming and unpleasant. A further shortcoming is that the shipping drums of this type cannot be reliably stacked unless placed in staggered relationship.

It is thus a primary object of the present invention to provide a means for allowing a drum to be used as a general purpose container which is capable of being stacked

one above another and can be transferred from one location to another with a standard fork lift truck.

It is another object of the present invention to provide an improved drum pallet which, when it is used in conjunction with a shipping drum, will make the drum capable of being easily handled with a fork lift truck. It is another object to provide a pallet which is rugged in construction, reliable in operation and can be manufactured at a reasonable cost.

Another object of the invention is the provision of an improved drum pallet which allows the forks of a lift truck to enter the opening provided in the pallet from any direction.

Another object of the present invention is the provision of an improved pallet for a shipping drum which allows the shipping drum to be engaged and lifted with a provision for maintaining the drum in the engaged position on the forks of the lift truck while the drum is tilted forwardly for the purpose of dumping the contents from the drum.

Another object of the invention is the provision of an improved pallet which renders the drum capable to being stacked and at the same time allows the drum to be reliably supported without subjecting the bottom portion of the drum to excessive localized forces.

This invention provides a shipping drum (e.g., a fifty-gallon steel drum) and a pallet rigidly secured to the bottom of the drum. The pallet includes an annular circumferentially extending recess below the drum thus affording radial symmetry which permits the forks of the lift truck to engage the pallet from any side of the container. The recess is defined by a central post, an upper fork engaging surface and a lower fork engaging surface spaced at a distance which is slightly greater than the thickness of the forks so that just sufficient clearance is provided to allow the forks to enter the recess. The recess is deep enough so that a sufficient amount of the upper and lower fork engaging surfaces are contacted to provide a secure connection. In general, at least about one-half the width of the forks should project into the recess. The lower fork engaging surface has a dual purpose. In addition to securing the container to the forks of the lift truck, a downwardly extending circular flange provides a recess which fits telescopically over the top of another similar drum thus allowing three or more drums to be stacked one above the other.

Other objects and advantages will become apparent from the accompanying 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, and

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

To the accomplishment of the foregoing and related ends the invention then 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 in-

dicative, however, of but a few of the various ways in which the principles of the invention may be employed.

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 circumferentially 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 them the pedestal **14**.

As seen in the figures, the periphery of the pedestal **14** is turned downwardly to provide a circumferentially 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 ⅛ inch thick sheet metal steel 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 crimped to the side wall **34** by 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 surface 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 fastened. 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 **49** 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 wall **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 **58** which serves both 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 this 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** is 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**. The invention has numerous benefits, the primary one being the elimination of the difficulty in stacking drums. This problem results from the fact that the forks used for elevating conventional drums cannot be removed when the drums are placed at the top of the stack or reinserted when the drums are to be removed.

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 specific embodiments described are given by way of example only and the invention is limited only by the terms of the appended claims.

I claim:

1. A pallet for transporting a shipping drum by means of a lift truck having forks, said drum having side walls and a bottom wall, said pallet comprising in combination an upper drum engaging element comprising a domed plate having portions adapted to be secured to the drum around its periphery at the bottom and thereof, a spacer means comprising a post secured to the center of the upper drum engaging element and being of a smaller diameter than the latter to provide an upper fork engaging surface above the post, said post extending downwardly from the drum engaging element a distance adapted to allow vertical clearance for the entry of said forks and a pedestal secured to the lower edge of the spacer means, said pedestal extending peripherally from the post to provide a lower fork engaging surface positioned a predetermined distance below the drum engaging element to define an annular recess having sufficient height to receive the forks of said lift truck and the post being of the appropriate width to pass between the forks when the forks are engaged in the recess whereby the forks can be inserted into the recess from any side of the pallet.

2. The apparatus of claim **1** wherein the upper drum engaging element comprises a horizontally disposed circular metal plate having a domed center portion and the pedestal is formed from a circular sheet metal member having a center portion which is domed and vertically extending flanges on the periphery of the drum engaging element and the pedestal for reinforcing the same and for centering the pallet on said drum.

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U.S. Cl. X.R.

108—58; 214—10.5; 220—97