United States Patent [19]

Du Puis et al.

[11] **3,726,424**

[45] **Apr. 10, 1973**

[54] **PALLET**

[76] Inventors: **Jules J. Du Puis,** 1002 S. Main Street, Wheaton, Ill. 60187; **Jack P. Du Puis,** 1 S. 465 Lewis, Lombard, Ill. 60148

[22] Filed: **Apr. 5, 1971**

[21] Appl. No.: **130,918**

[52] **U.S. Cl.** **214/620,** 108/51
[51] **Int. Cl.** **B66f 9/12**
[58] **Field of Search** 214/620; 108/51

[56] **References Cited**

UNITED STATES PATENTS

2,584,240	2/1952	Stewart	214/620 X
3,514,001	5/1970	Meritt et al	214/620
3,292,804	12/1966	Veneman	214/620 X

Primary Examiner—Robert J. Spar
Attorney—Fitch, Even, Tabin & Luedeka

[57] **ABSTRACT**

A lift truck pallet is provided with rotatable load supporting means for transferring a load from the pallet in a direction lateral to the direction of insertion of forks therein. The preferred rotatable load supporting means is in the form of rotatable rollers having axes substantially parallel to the direction in which the forks are received in the pallet, and drive means may be provided to rotate the rollers to transfer the load from the pallet to a space located laterally of and adjacent to the pallet.

3 Claims, 3 Drawing Figures

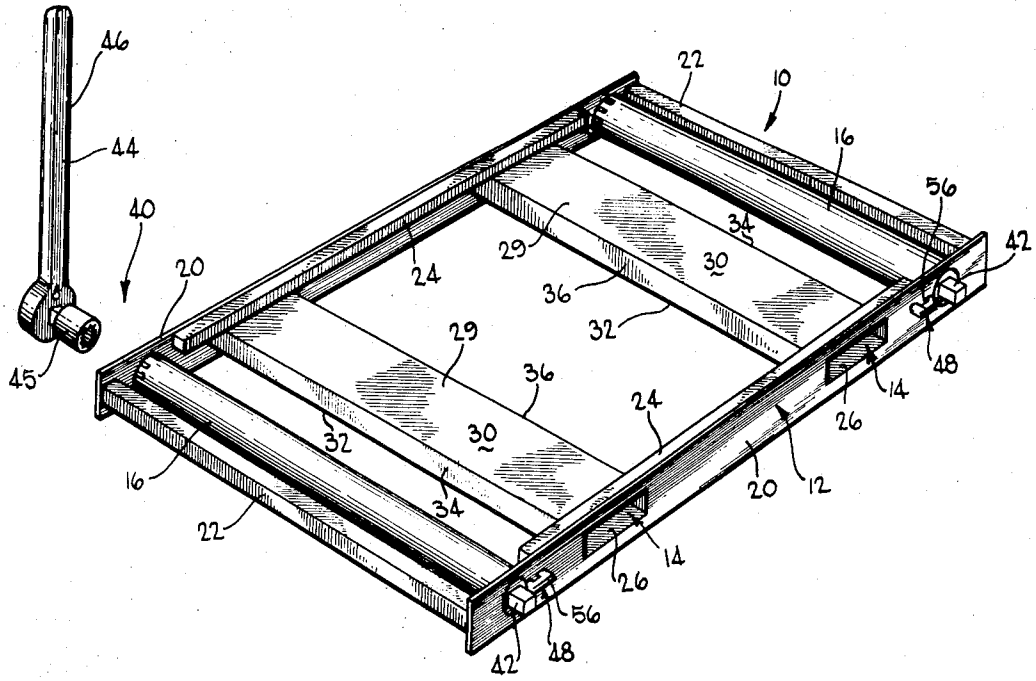


FIG.1

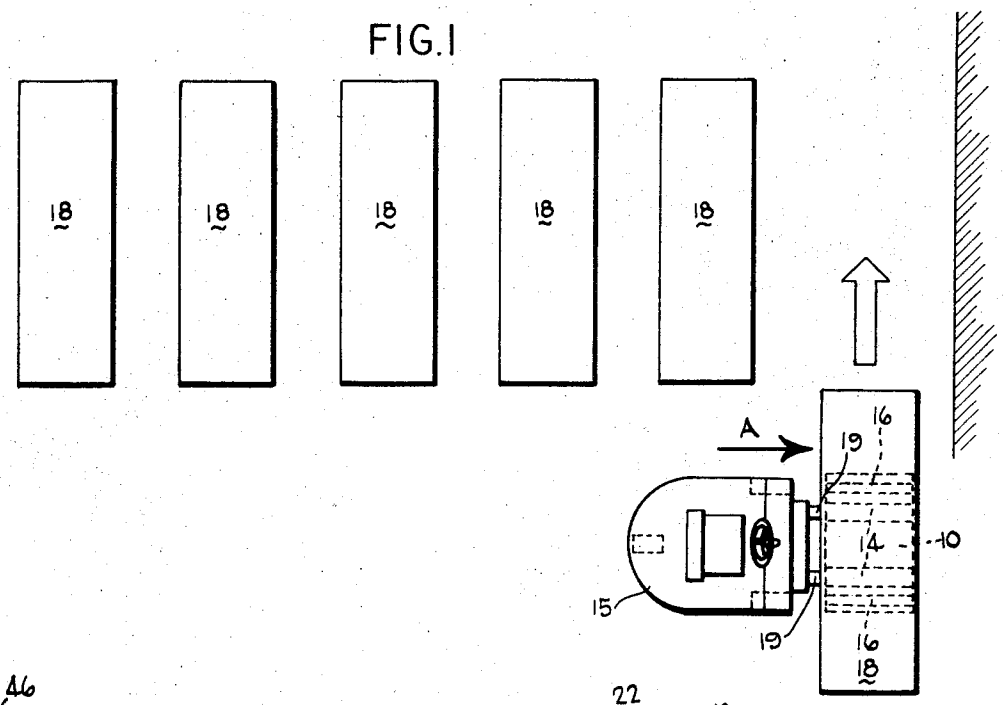


FIG.2

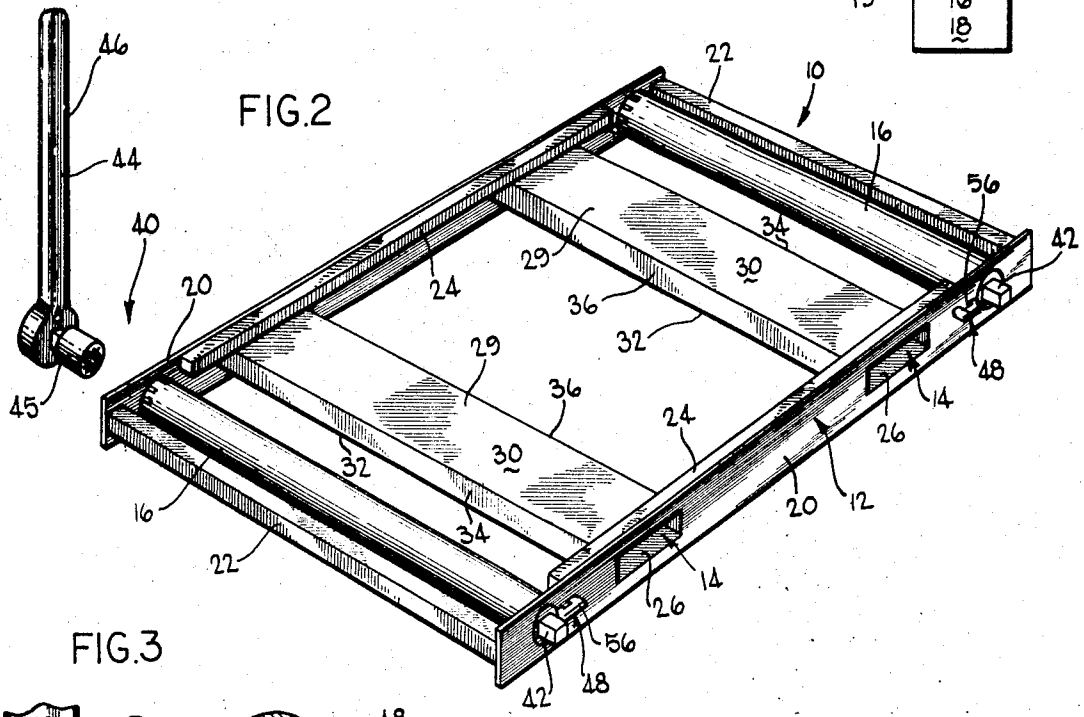
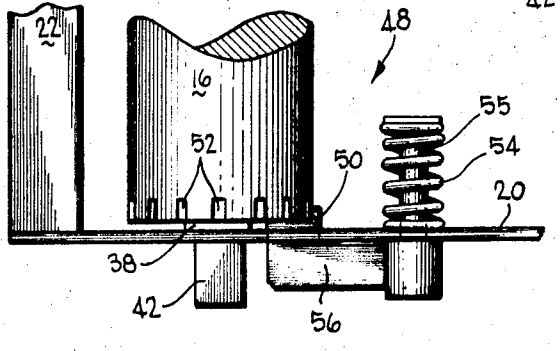


FIG.3



INVENTORS
JULES J. DU PUIS
JACK P. DU PUIS
Fitch, Even, Tabin & Luedeka
ATTYS.

PALLET

The present invention relates to pallets for supporting loads and, more particularly, the invention relates to a pallet for transferring a supported load in a confined area.

A load of merchandise, such as lumber, steel beams, rugs, or other heavy, elongated articles, is often stacked upon a pallet, which is carried by a fork lift truck from one location to another. For example, the palletized load may be transported by the truck from a warehouse loading ramp to a designated position in a row of merchandise. It is particularly desirable to conserve space in the warehouse and accordingly the rows of stacked merchandise are usually closely spaced. However, normal lift truck operation is made exceedingly difficult as the trucks cannot maneuver within the aisles between the rows to emplace or remove merchandise. Heretofore, when the aisles have been too narrow for the lift trucks to maneuver, manual labor has been employed to handle the loads or expensive special fork lift trucks and other equipment have been used which is capable of manipulating the palletized loads within the aisles such that the loads can be transferred laterally into the desired positions in the rows.

An object of the present invention is to provide an improved pallet for supporting and transferring a load.

Another object of the invention is to provide an improved pallet adapted to transfer a supported load in a confined area.

These and other objects of the invention will become apparent upon reference to the following detailed description and accompanying drawings, in which:

FIG. 1 is a schematic representation of a load being transferred within a confined area;

FIG. 2 is a perspective view of a pallet for supporting and transferring the load; and

FIG. 3 is an enlarged plan view of a portion of the pallet shown in FIG. 2.

Very generally, there is illustrated in the drawings a pallet **10** for supporting and transferring a load **18** comprising a frame **12** and a pair of fork receiving pockets **14** into which may be inserted forks **19** of a fork lift truck **15**. The fork lift truck may travel in a forward direction, as indicated by the directional arrow A in FIG. 1 or in a direction reverse thereto. With use of the pallet **10**, the load **18** may be shifted laterally, at right angles in this instance, to the direction of truck movement with turning of rotatable load supporting means, preferably in the form of rollers **16** journalled for rotation in the pallet frame to turn about axes substantially parallel to the direction of the forks and truck movement. Means may be provided to turn the rollers **16** to transfer the load laterally from the pallet, and means may be provided for detenting the rollers against rotation while the pallet and load are being transported.

The illustrated pallet **10** is particularly useful in handling loads in confined areas. A load **18**, such as lumber, steel beams, rugs, poles, etc., is stacked transversely across the pallet and the palletized load is transported to a location adjacent a row of other merchandise in a warehouse, such as shown in FIG. 1. The load is transferred in a lateral direction from the pallet into a space in the row. The space illustrated in FIG. 1 is adjacent one side of the pallet and located adjacent another wall which would limit maneuvering the lift truck. Accordingly, a fork lift truck **15** used to transport the loaded pallet need not maneuver within an aisle between two parallel rows of merchandise. The fork lift truck proceeds straight ahead in the aisle and stops slightly behind the desired location, whereupon the load, which is at the front of the truck, is transferred laterally from the truck. It should further be appreciated that any standard fork lift type industrial truck can be employed to transport the pallet of the illustrated embodiment and that no special, relatively expensive equipment need be utilized either for transporting the pallet or for unloading it.

The frame **12** of the pallet **10** supports both the pockets **14** which receive the forks **19** of the lift truck **15** and the rollers **16** which permit lateral transferring of the load. The frame **12** is of rigid construction so as to receive and carry a heavy load **18**, such as steel beams or lumber, without buckling. The illustrated frame **12** is rectangular in shape and includes a pair of substantially parallel end plates **20** and a pair of substantially parallel side channels **22** connecting the respective ends of the end plates **20**. The side channels **22** are shorter in height than the end plates **20**. An elongated stiffener **24** is secured to one or both of the end plates **20** to prevent the end plates from buckling. The fork receiving pockets **14** each include apertures **26** formed in the end plates **20** and spaced suitable distances apart to allow the forks **19** of the lift truck **15** to enter. Where the apertures **26** are located in both end plates **20**, the fork lift truck can approach and lift the pallet from either of two opposing directions.

The form receiving pockets **14** further comprise elongated channels **29** welded to the end plates **20** with internal openings in the channels aligned with the apertures **26** in opposite end plates **20**. The apertures and the channels are of suitable dimensions to receive the forks **19** of the lift truck **15**. Each of the elongated channels **29** extends substantially perpendicular to the end plates **20** and substantially parallel to the rollers **16**. This permits the pallet to be lifted and carried in a direction parallel to the longitudinal dimension of the fork receiving channels and rotational axes of the rollers **16**. It should be noted that single pocket pallets may be provided when single blade-type lift trucks are employed.

The channels **29** are substantially rectangular in cross-section and each includes a top wall **30**, a bottom wall **32**, and substantially parallel outer and inner side walls **34** and **36** connecting the top and bottom walls. The walls may be reinforced adjacent one or both ends, if desired, and in some instances it may be advantageous to delete the bottom wall. Each fork of the truck used for lifting the pallet is received and is enclosed within the walls, with each fork **19** resting against the underside of the top wall **30** of its respective channel when the pallet is lifted. The flat top wall **30** has the additional function of supporting the load. As aforesaid, the load preferably extends transversely across the pallet. Therefore, the load is supported by the two fork receiving channels **29** and by the two rollers **16**, but not by the side channels **22**.

The ability to transfer the load **18** laterally from the pallet **10** is especially advantageous when the load is extremely heavy or has been stacked to a great height. In the first instance, the warehouseman may be unable

to push and slide a heavy load from an ordinary pallet. In the second instance, pushing a high stacked load from an ordinary pallet may result in the load tumbling to the floor because of the high frictional resistance to sliding between the load and ordinary pallet. With the pallet **10**, however, the load may be pushed with the rollers **16** turning as the load moves laterally. Also, the rollers **16** which support the load may be rotated to positively drive the load off the pallet into the selected space.

Preferably, two rollers **16** are utilized to transfer the load **18** as a pair of rollers provides positive traction and permits unloading in either of two directions. Both of the rollers **16** are positioned in the frame **12** adjacent the respective outer side walls **34** of each of the channels **29**. The rollers are accordingly located at opposite lateral edges of the frame **12** and are positioned immediately within the side channels **22**. Locating the rollers at the lateral edges of the pallet ensures the transfer of the entire load from the pallet. It should be noted, however, that one roller **16** may satisfactorily transfer a load from the pallet. The rollers **16** are journalled in bearings **38** (FIG. **3**) in the end plates **20** to permit nonbinding rotational movement of the rollers. The rollers **16** may be provided with a friction-increasing surface, such as rubber, to better engage and transfer the load.

To rotate the rollers **16** and thus discharge the load from the pallet **10**, a drive system **40** may be employed. Preferably, the drive system **40** for the rollers **16** is entirely independent of the lift truck **15** so that specially designed fork lift trucks with extra drive mechanisms are not needed nor are specially designed jigs required for use with the pallet **10**.

Preferably, the drive system **40** for the rollers is located externally of the rollers so that the drive system is not damaged when the pallet is being loaded and transported. The preferred external drive system permits the individual pallets to be constructed simply and relatively inexpensively. To this end, a squared-end trunnion **42** extends outwardly from at least one end of each roller **16** beyond the respective end plate **20**. The trunnion **42** and its associated roller **16** are rotatable by a ratchet-type wrench **44** having a socket **45** which receives the trunnion **42** and which is operatively connected to an elongated handle **46**. Rotation of the roller by the wrench **44** upon turning movement of the handle **46** frictionally transfers the load supported by the roller from the pallet. The drive system may also comprise a ratchet wheel (not shown) mounted either externally on or internally of the roller. In either case, a simple lever or handle **46** is used to rotate the roller. The wrench or simple lever or handle employed to rotate the rollers can be mounted directly to the frame **12** or can be independent thereof. Alternatively, an electric motor can be mounted on the pallet for rotating the rollers **16** through a gear train or other power transmission apparatus.

A detenting means or lock **48** is preferably provided at least at one end of each roller **16** for normally preventing the rollers from rotating and thereupon transferring the load from the pallet **10** while the pallet is being transported by the lift truck **15**. At best seen in FIG. **3**, the illustrated lock **48** includes a detent pawl **50** which is normally received in one of a plurality of grooves **52** formed in the outer surface of the adjacent roller **16**. A torsion spring **54** biases the detent pawl into one of the grooves. More specifically, the torsion spring **54** has one end fastened to the end plate **20** and its other end fastened to a shaft **55** which is journalled for turning in the end plate **20**. The shaft **55** is connected to arm **56** of the detent pawl **50** and acts therethrough to bias the pawl **50** into a groove **52**. The arm **56** may be pulled outwardly away from the end plate **20** with the torsion spring **54** being compressed and the pawl **50** being moved outwardly from the grooves **52**. The roller **16** is thus free for rotation by the drive system **40**. The lock **48** is rendered inoperative by twisting the arm **56** when in its pulled out position such that the detent **50** rests on the outer side of the end plate **20** and is spaced from the roller **16**.

A brief description of a use of the pallet will now be given. After the pallet **10** has been loaded, the fork lift truck **15** is maneuvered such that its forks **19** are respectively positioned within the pockets **14**. The truck lifts the pallet and proceeds down an aisle until the pallet, which is at its front end, is adjacent a space in a row of merchandise. It is unnecessary to maneuver the truck to place the pallet in the space. The locks **48** are released, and then the drive system **40** is employed to rotate the rollers **16** to transfer the load **18** from the pallet into a space, as shown in FIG. **1**. Therefore, the load can be placed in a space in the row of merchandise although the rows are so closely spaced that a standard industrial truck could not manipulate palletized loads to place them directly into the selected locations.

It should be appreciated that the load could also be transferred from the pallet to a second pallet positioned in the space in the row. This makes it easier to remove the load from the space when it is desired to use the merchandise. When employing a second pallet, the rollers of both pallets are preferably rotated in the same direction to efficiently transfer the load between the pallets. To return the load to a pallet located in the aisle, the rollers of both pallets are rotated in the same direction toward the aisle, whereupon the load is transferred onto the pallet in the aisle.

Thus, the present invention provides an improved pallet for laterally transferring a load therefrom and within a confined area.

While the pallet **10** has been described in connection with one use, as in confined areas, the pallet may be advantageously employed in a number of other situations. For example, in a lumber yard, a stack of lumber may be spanning spaced blocks with opposite ends resting on the blocks. The pallet **10** carried by a lift truck **15** may be inserted into the space beneath the stack and between the blocks and then the stack may be lifted from the blocks and transported on the pallet to another location at which the stack may be pushed from or driven from the pallet **10** with turning of the rollers **16**.

The stack of lumber on the pallet **10** may be transferred in a lateral direction to various receivers such as, for example, a conventional split bed truck. This kind of truck is usually provided with a flat, generally horizontal bed having two sets of spaced apart, transversely extending conveyor rollers. Each set of rollers form a roller conveyor which extends from the rear to the front of the truck bed. The truck bed may be enclosed with doors at the end of the truck body through

which stacks of lumber may be loaded onto or unloaded from the conveyor rollers. A stack of lumber may be readily loaded onto or from the pallet rollers **16** by raising the pallet to the height of the conveyor rollers on the truck bed with the axes of the pallet rollers **16** being substantially parallel to the conveyor rollers. Then the load may be transferred with turning of the truck conveyor rollers (not shown) and the pallet rollers **16**.

While only two rollers **16** are shown on the illustrated pallet **10**, it is to be understood other load supporting rollers could be added to and journaled on the pallet frame to support the load at additional points or areas and to assist in the case of transfer of the load. Such additional rollers on the pallet could either be idler rollers which are not driven as by the drive system **40**; or, on the other hand, the additional rollers on the pallet could be driven through gears or belts to turn with the illustrated rollers **16** at the ends of the pallet. In another embodiment of the invention (which is not shown) sockets are formed in the ends of the roller shafts and the illustrated square-end trunnions **42** projecting outwardly from the end plates **20** are eliminated. Instead, the projecting trunnions are on the wrench **44** for insertion into the sockets formed in the ends of the rollers **16** to turn the rollers and shift the load thereon.

While one specific embodiment of the invention has been shown and described, it should be apparent that various modifications could be made therein without departing from the scope of the invention. For example, a pair of rollers could be located at each side of the pallet to transfer the load, especially when the load is extremely heavy.

Various of the features of the invention are set forth in the following claims.

What is claimed is:

1. A pallet for receiving the forks of a lift truck in a given direction and for transferring the load from the pallet in a direction lateral to the given direction, said pallet comprising: a rectangular frame having a pair of parallel end members and having a pair of parallel side members joined at opposite ends thereof to said end members, said end members having spaced apertures therein to admit forks of a lift truck, a pair of elongated channels secured to said end members having internal openings aligned with said apertures for receiving said forks of said lift truck, a pair of rollers journaled centrally of the height of the end members for rotation about axes parallel to said side members for supporting the load, means enabling drive of said rollers for rotating the same to transfer the load in the lateral direction, a ratchet means associated with each of said rollers, a pawl means engageable with said ratchet means to hold said ratchet means against turning, a biasing means urging said pawl means in a direction parallel to said axes to engage said ratchet means and thereby hold said rollers against turning, and means enabling shifting of said pawl means against the urging of said biasing means and a turning thereof to an inoperative position to allow turning of said rollers by said means enabling driving of said rollers.

2. A pallet in accordance with claim **1** in which said ratchet means comprises a plurality of axially extending slots formed in the end of each roller.

3. A pallet in accordance with claim **1** in which said channels are enclosed by a pair of top and bottom walls joined to a pair of side walls to enclose said forks, and elongated stiffeners are secured to said end members having the fork receiving apertures therein to stiffen the same at said apertures.

* * * * *