This invention relates to a foldable expendable pallet. More particularly, this invention relates to a foldable expendable pallet in which the pallets are loaded so that sheets of high strength paper adhesively attached and suspended between two substantially parallel semi-cylindrical channels.

This application is a continuation in part of copending application S.N. 516,614, filed June 20, 1955, now abandoned.

Pallets are widely used in the material handling art and are often made of double-face wooden construction. It is recognized that there are three disadvantages inherent in pallets of this construction. A primary disadvantage of wooden pallets is that they are relatively heavy and add materially to the gross load of the shipment, thereby increasing shipping costs. A second shortcoming of wooden pallets is that they are sufficiently costly that they must be reused. The necessity of reusing the pallets entails appreciable freight charges in returning the empty pallets to the original shipper and, in addition, requires the consignee to keep extensive records of the pallets received from and returned to numerous suppliers. The third major disadvantage of wooden pallets is that they are relatively bulky and take up considerable storage space.

Numerous methods of making inexpensive expendable pallets have been proposed. For example, U.S. Patent 2,506,346 illustrates a non-foldable pallet that is prepared from sheets of heavy corrugated boxboard stock and has closed semi-cylindrical channels attached to the top surface thereof. While certain of the expendable pallets heretofore proposed have some merit, all of them are still relatively costly to make. Moreover, the proposed pallets are relatively bulky and thus take up considerable space in storage.

Accordingly, it is an object of this invention to provide a foldable expendable pallet that can be produced at low cost and requires a minimum of space for storage.

This and other objects and advantages of the present invention will be apparent from the following detailed description of the preferred embodiment, and the attached drawings, in which:

FIGURE 1 is a partially exploded perspective view of a pallet of this invention;  
FIGURE 2 illustrates a plurality of pallets nested together in one manner in which they may be stored;  
FIGURE 3 is a partially exploded perspective view of a folded pallet of this invention;  
FIGURE 4 illustrates a plurality of pallets in folded nested relationship for a minimum of storage space.  
FIGURES 5 and 6 are views of partially loaded pallets.  
In accordance with the present invention, an extremely lightweight low cost pallet is provided as illustrated in the attached drawings. The preferred construction is shown in FIGURE 1, wherein a sheet of high strength paper 1 is adhesively attached to the perimeters of two substantially parallel spaced semi-cylindrical channels 3--3 and suspended therebetween. The semi-cylindrical channels 3--3, are longitudinal in shape and are cut out from the supporting floor of the pallet. The web or supporting floor of the pallet must be a suitable strength to support the load without collapsing. Preferably, the longitudinal half-sections are constructed of spirally wound cemented fiberboard tubes. In part, the use of longitudinal half-sections of spirally wound cemented fiberboard tubes is dictated by the consideration that the semi-cylindrical channels must have a wall thickness of only 0.1 to 0.5 inch so that the pallet can be easily nested. The pallets of the present invention are easily nested so that the bottoms of the semi-cylindrical channels are open and the pallets can be easily nested for storage as illustrated in FIGURE 2 or folded as shown in FIGURES 3 for stacking as delineated in FIGURE 4. Such nested storage requires a minimum of floor space. It is equally apparent that since the pallets contain no hollow spaces in their construction other than the channels 3--3 required for the insertion of lifting forks, their use permits maximum utilization of shipping space in the carrier.

When bagged materials are to be carried by the pallets, the pallets are loaded so that the pallets can be easily nested for storage. The bottoms of the semi-cylindrical channels are open and the pallets can be easily nested for storage as illustrated in FIGURE 2 or folded as shown in FIGURES 3 for stacking as delineated in FIGURE 4. Such nested storage requires a minimum of floor space. It is equally apparent that since the pallets contain no hollow spaces in their construction other than the channels 3--3 required for the insertion of lifting forks, their use permits maximum utilization of shipping space in the carrier.

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It is necessary to use at least 70-pound kraft paper to obtain the necessary strength in the pallet. To function properly, the supporting floor of the pallet must be flexible and deform slightly when loaded so that the pallet will securely grip the supporting base on which it rests. This frictional grip is necessary so that the forks of the lift can be removed easily from the semi-cylindrical channels. The flexibility of the supporting floor of the pallet also permits the individual pallets to be folded, as shown in FIGURE 3, so that the two tine-receiving channels thereof are nested together. Fifty of such folded pallets can be stored in a space 2 ft. x 3 ft. x 4 ft. as illustrated in FIGURE 4. Thus, fifty stored pallets will occupy only 24 cu. ft. of storage space. Furthermore, the flexibility of the supporting floor of the pallet will also permit the lower bags of a fully loaded pallet to “tie in” or grip the upper layer of bags of the pallet immediately below it so as to form a tightly knit shipping unit that is more resistant to shifting when subjected to sudden starts and stops.

In a particular embodiment of the invention, the kraft paper employed as the pallet floor has high wet strength. By high wet strength it is meant that the paper, when wet, will retain at least 25% of its dry strength. High wet strength papers of this type are well-known in the art and are customarily prepared by impregnating the paper with a thermosetting resin such as a melamine-formaldehyde resin. Similarly, the spirally wound cemented fiberboard tubes from which the semi-cylindrical channels are cut are fabricated from high wet strength paper and a water-resistant adhesive is used in cementing the tubes.

An outstanding feature of the pallets of the present invention is that they are particularly adapted to be used with standard fork lift trucks without the necessity of employing special forks. Accordingly, the semi-cylindrical channels of the pallets of this invention will preferably have internal diameters of 4-8 inches and the distance between the center lines of the semi-cylindrical channels is preferably set at from 20 to 30 inches.

The pallets of this invention have undergone extensive field tests and will easily carry gross loads of up to 2000 pounds.

The foregoing description is merely illustrative of the invention and it is obvious that many variations can be made thereon without departing from the spirit and scope of the invention.

What is claimed is:

A foldable pallet, adapted to occupy a minimum of space when stored, consisting of, in combination, a pair of substantially parallel open channels defined by rigid longitudinal semi-cylindrical sections constructed of half-sections of spirally wound cemented fiberboard tubes having a wall thickness of 0.1 to 0.5 inch and a horizontally oriented flexible supporting web adhesively attached at the bottom surface thereof to the convex outer surfaces of said semi-cylindrical sections, whereby the center lines of said semi-cylindrical sections are positioned below said supporting web to receive the two lines of a fork lift truck within the open concave undersurface thereof and whereby said kraft paper may be folded over such that the two tine-receiving channels thereof may be nested first together and then with pluralities of similarly folded pallets to occupy a minimum of storage space.

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