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[54] **STORAGE RACK**
3 Claims, 8 Drawing Figs.

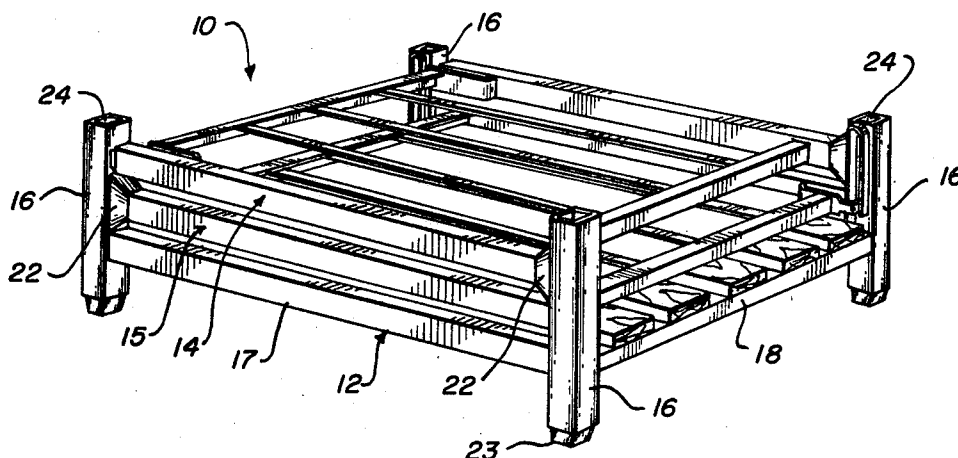
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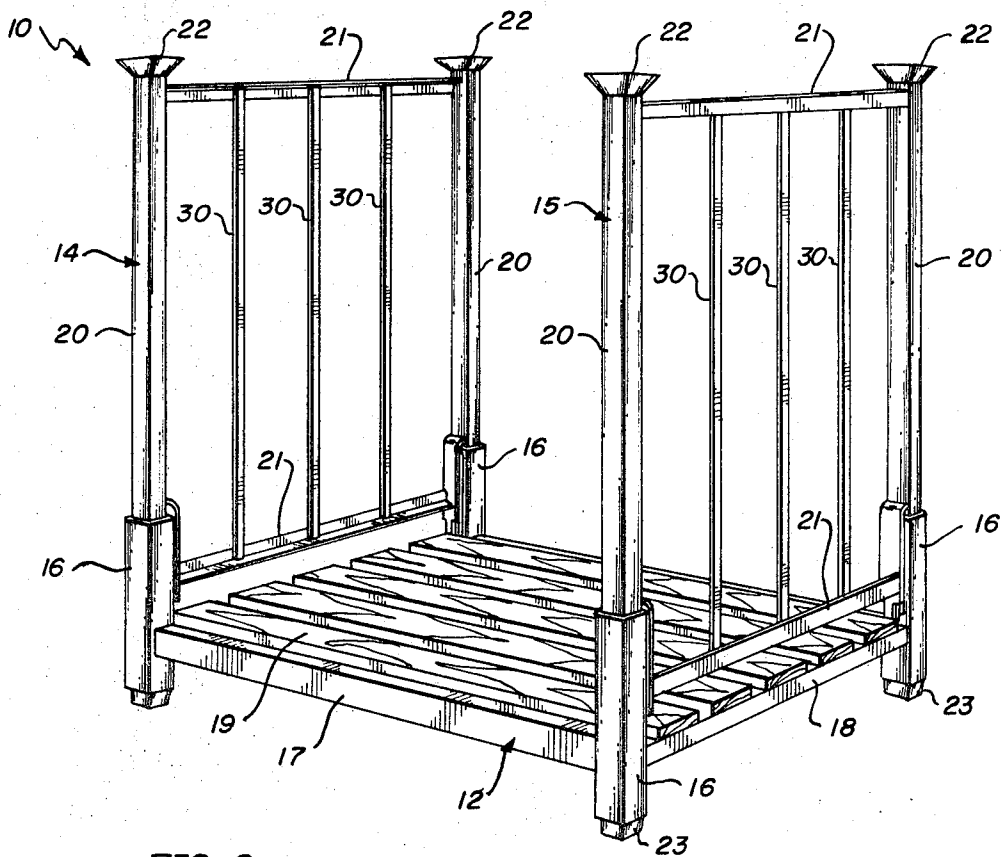
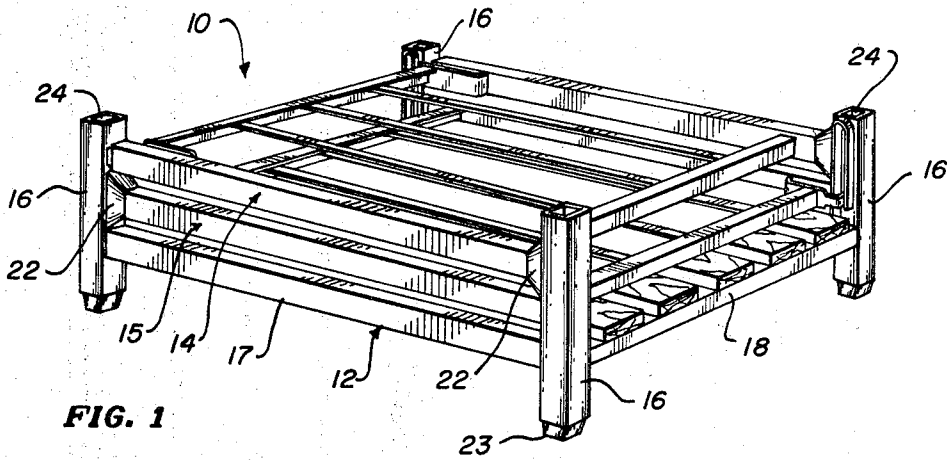
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[50] Field of Search..... 108/51—58

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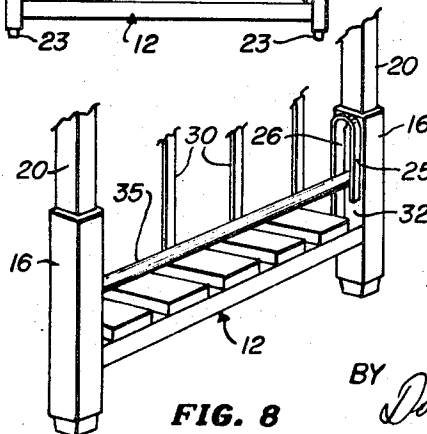
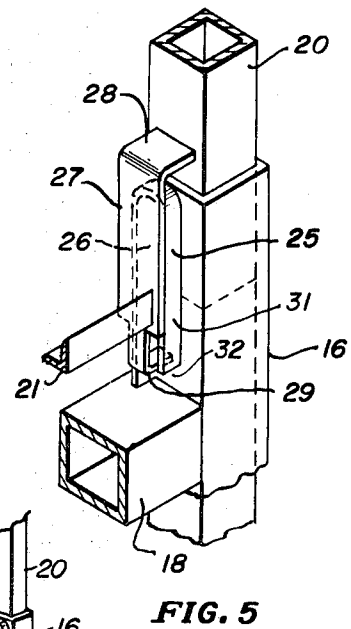
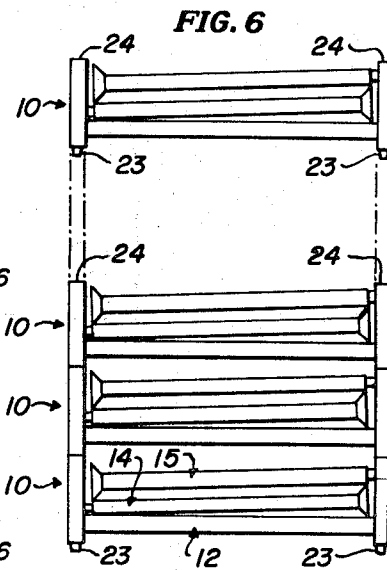
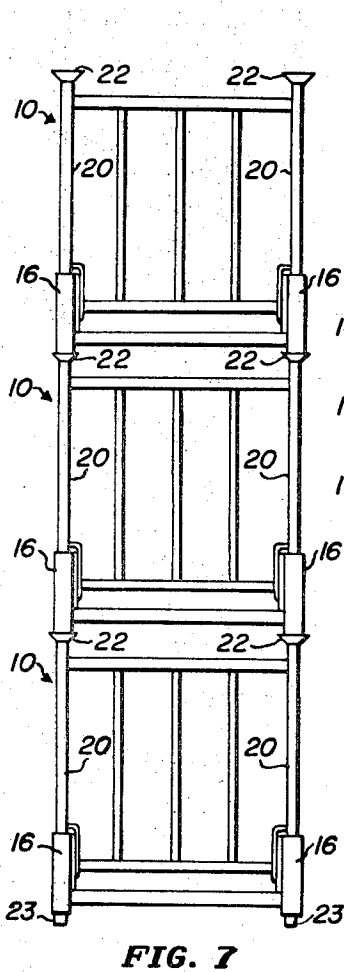
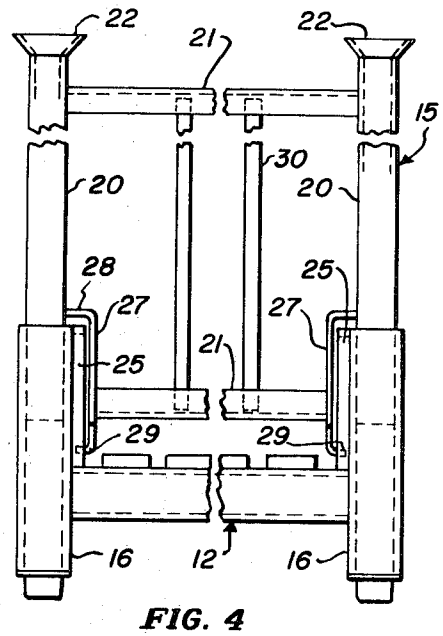
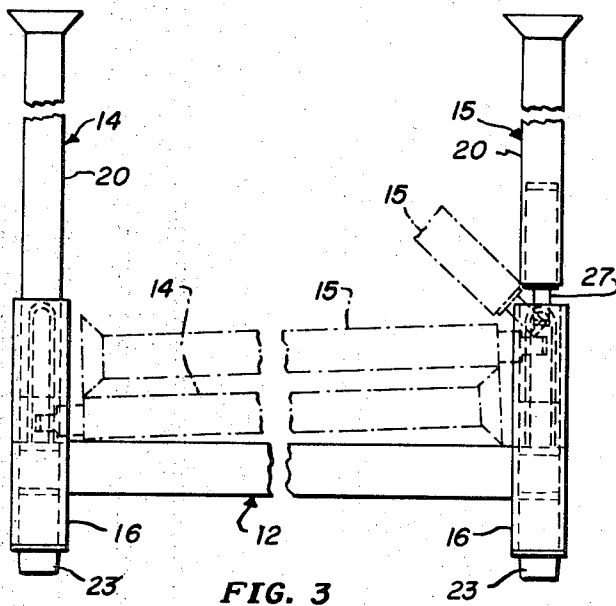
ABSTRACT: A modular rack for storing and shipping articles of manufacture. The rack is constructed in a fashion such that its upright end frames can be folded flat atop the base platform for transporting or storing the racks, and further are releasably affixed to the base platform so that they cannot jar loose from folded position while being transported.





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STORAGE RACK

This invention relates to new and improved modular racks for storing and shipping articles of manufacture and the like.

Many different racks of this type, or for this purpose, presently are available, however, all of them are objectionable for one reason or another. For example, most of them are commonly fabricated to permit telescopic insertion of upright frames into a base member, to assemble a cooperating unit. Appropriately matched tubing members conveniently assemble together to form the joint between the upright frames and the base member. The intent of this construction method is to permit breakdown of the racks for storage, into minimal space consuming volume. The difficulty with this construction is that these upright frames jar loose, if laid flat on the base member, while being transported, and many of them are subject to damage or loss. In an effort to reduce such loss, these types of racks generally have the upright frames removably locked to the base members through the use of some means which require slots or holes to be drilled or otherwise formed in the individual legs thereof. These slots or holes, however, weaken the legs so that stacking of loaded racks can create a hazardous condition should one or more of the legs buckle, thereby causing the stack of loaded racks to topple.

Accordingly, it is an object of the present invention to provide new and improved racks, for shipping and/or storing articles of manufacture and the like.

Another object is to provide new and improved racks having fold-in end frames that cannot jar loose from folded position while being transported empty.

Still another object is to provide new and improved racks having fold-in end frames which conserve storage space for empty racks, which can be stacked.

A still further object is to provide new and improved racks having unique "hairpin" locks which permit easy removal of the end frames thereof should they become damaged in some way, or require replacement for functional or dimensional changes, automatically and without any need for tools.

A still further object is to provide new and improved racks constructed in a fashion such that the locks for the end frames actually strengthen the legs of the end frames so that fully loaded racks can be stacked up to six high, and will stand rigid and secure.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the invention will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawings, in which:

FIG. 1 is a perspective view of a rack exemplary of the present invention, illustrated folded for storage;

FIG. 2 is a perspective view of the rack of FIG. 1 with its end frames in an upright position;

FIG. 3 is a partial side plan view of the rack of FIG. 1, generally illustrating the manner in which the end frames are folded for storage;

FIG. 4 is a partial end plan view of the storage rack of FIG. 1, generally illustrating the manner in which the end frames telescopically interlock with the base member;

FIG. 5 is an enlarged partial perspective view illustrating the hairpin locking assembly for lockingly affixing the upright end frames to the base member;

FIG. 6 is a view illustrating the manner in which a number of the racks with the upright end frames folded for storage can be stacked;

FIG. 7 is a view illustrating the manner in which the racks can be stacked, with the end frames disposed in a vertical assembled position; and

FIG. 8 is a partial perspective view illustrating a modified lock assembly.

Similar reference characters refer to similar parts throughout the several views of the drawings.

Referring now to the drawings, in FIGS. 1 and 2, there is illustrated a rack 10 having a base member 12 and end frames 14 which are adapted to be folded, as illustrated in FIG. 1, to permit the rack 10 to be compactly folded into minimum space consuming volume for storage when not in use, and to be assembled in vertically disposed position, as illustrated in FIG. 2, for storing and shipping different articles of manufacture.

The base member 12 includes a rectangular-shaped platform 15 formed of four tubular corner posts 16 which are fixedly secured together by means of the frame members 17 and 18. These frame members 17 and 18 are affixed to the corner tubing posts 16 so as to provide an underclearance of approximately 4-1/2 inches to permit the tines of, for example, a forklift truck to be inserted beneath the rack to lift it and to move it about. A number of slats 19 are affixed to the frame members 18 to complete the platform 15. These slats 19 can be of wood, rigid plastic, metal or other suitable rigid material. The terminal end 24 of each of the corner posts 16 is opened, and is adapted to receive the lower end of the frame corner post 20 of the end frames 14 in a telescopic fashion, as described more fully below.

The lower ends of each of the corner posts 16 have rectangular, truncated feet 23 affixed to them which are adapted to both seat in the opened end 24 of the corner tubing posts 16 of another similar rack 10, and within seats 22 affixed to the terminal end of the frame corner posts 20.

The end frames 14 are of like construction and each includes two frame corner posts 20 which are fixedly secured together to form a rectangular-shaped structure by means of the frame members 21 affixed between them near the upper and lower end thereof. A number (3 as illustrated) of rails 30 are affixed to the frame members 21 so as to extend parallel to one another and to the frame corner post 20, and function to prevent the articles of manufacture from spilling off of the rack 10. The lower end of each of the frame corner post 20, as indicated above, is adapted to be telescopically received within the open end 24 of one of the corner posts 16, to support the end frames 14 in vertically disposed positions.

The end frames 14 are removably affixed respectively to the two corner posts 16 at the opposite ends of the base member 12 by means of a "hairpin" lock assembly, in a fashion such that these end frames cannot jar loose from the base member 12 when in the folded position while being transported empty. These "hairpin" lock assemblies also strengthen the legs formed by the end frames 14 and the corner posts 16, since there are no slots or drilled holes in them to weaken them as normally done in the past for receiving locks of various constructions for affixing the end frames to the base member. These "hairpin" lock assemblies, as can be best seen in FIG. 5, each includes a U-shaped retaining member 25 which is abutted against and fixedly secured to one of the corner posts 16 and to the frame member 18 in a fashion such as to provide a retaining recess 26, which is closed at its upper end. It may be noted that the legs 31 of each of the U-shaped members 25 is shortened and is not affixed to the frame member 18, so that a release slot 32 is provided whereby the end frames 14 can be disengaged from the base member 12, as fully described below. The other half of each of the lock assemblies includes a lock member 27 in the form of a flat bar having one end bent at a 90° angle so as to form a flange portion 28 which is fixedly secured to one of the frame corner posts 20. The opposite end of the lock member 27 is cut away and is bent at a 90° angle so as to form a lockin flange 29 which is slidably fitted and retained within a retaining recess 26 of one of the U-shaped retaining members 25. It can be seen that this construction provides or permits slidable, telescopic freedom between the frame corner post 20 and the corner posts 16, but only to the vertical limit of the flange 29 engaging the closed loop at the end of the U-shaped member 25. At this point, only arcuate motion is possible between the frame corner post 20 and the base member 12, as can be best seen in FIG. 3.

As best seen in FIGS. 1, 3 and 6, the end frames 14 can be folded atop the platform 15 of the base member 12 so that the racks 10 can be stacked in minimal space consuming volume, as illustrated in FIG. 6. As indicated above, the seats 23 on the base of each of the corner posts 16 are adapted to seat within the open end 24 of the corner posts 16 of another similar rack 10.

To assemble the end frames 14 in vertical positions, they are pivotally lifted until the ends thereof are vertically disposed over the open ends 24 of the corner posts 16, and the ends then telescopically slidably disposed within the corner posts 16, as illustrated in FIGS. 2-5 and 7. With the end frames 14 assembled in this fashion, the racks 10 can be stacked atop one another, as illustrated in FIG. 7, by engaging the seats 23 on the ends of the corner posts 16 within the seats 22 affixed to the upper ends of the frame corner posts 20. Since there are no slots or drilled holes in the legs formed by the frame corner posts 20 and the corner posts 16 to weaken them, the legs are rated at full capacity and fully loaded racks can be stacked up to six high, and will stand rigid and secure.

To disengage the end frames 14 from the base member 12, the end frames first are raised to remove the ends of their frame corner posts 20 from the open ends 24 of the corner posts 16. The end frames now are pivoted outward, away from the base member 12 and simultaneously the locking flanges 29 are permitted to slide vertically downwardly in the retaining recesses 26 until they can be disengaged therefrom, by sliding them through the release slots 32. It will be noted that removing the end frames 14 for, for example, repairing or replacing a damaged one, can be easily and simply accomplished without the need of any additional tools.

The retaining assemblies 25 can be modified, by eliminating the lock member 27 and the frame member 21 and substituting in place thereof a bar of round stock 35. The latter is affixed to the lower ends of the rails 30 and extended directly into the retaining recesses 26, as illustrated in FIG. 8.

It will thus be seen that the objects set forth above, among those made apparent from the preceding description, are efficiently attained and certain changes may be made in the above construction. Accordingly, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. A rack for storing and shipping articles comprising: a rectangular-shaped base member having a horizontally disposed platform and vertically disposed tubular legs affixed to said platform at each of its four corners, the upper end of each of said legs being open; a pair of rectangular-shaped end frames each having two corner posts which are affixed together in parallel spaced relation and are proportioned to be telescopically received within the open ends of the two legs at the ends of said platform of said base member respectively to vertically support said end frames; a lock assembly affixed to each of said legs and to its associated corner post for lockingly affixing said end frames to said base members, said lock as-

semblies further being adapted to permit said end frames to be folded atop said platform of said base member for storage, said lock assemblies each comprising a lock member affixed to said leg defining a retaining recess which is of a predetermined length and which is closed at at least its upper end and a cooperating lock member affixed to said corner post having a locking flange slidably disposed within said retaining recess, the length of said retaining recesses being proportioned to permit said lock members to be slidably raised in said retaining recesses to permit the ends of said corner posts to be removed from the open ends of said legs and said end frames to thereafter be pivotally folded atop said platform while still being lockingly affixed to said base member, each of said retaining recesses further being open along one side thereof at its bottom to permit said locking flanges to be slidably disengaged therefrom when said end frames are raised to remove the ends of the corner posts thereof from the open ends of said legs and are pivoted outwardly away from said base member.

2. A rack for storing and shipping articles comprising a rectangular-shaped base member having a horizontally disposed platform and vertically disposed tubular legs affixed to said platform at each of its four corners, the upper end of each of said legs being open; a pair of rectangular-shaped end frames each having two corner posts which are affixed together in parallel spaced relation and are proportioned to be telescopically received within the open ends of the two legs at the ends of said platform of said base member respectively to vertically support said end frames; a lock assembly affixed to each of said legs and to its associated corner post for lockingly affixing said end frames to said base member, said lock assemblies further being adapted to permit said end frames to be folded atop said platform of said base member for storage, said lock assemblies each comprising a lock member affixed to said leg defining a retaining recess which is of a predetermined length and which is closed at at least its upper end and a cooperating lock member affixed to said corner post having a locking flange slidably disposed within said retaining recess, the length of said retaining recesses being proportioned to permit said lock members to be slidably raised in said retaining recesses to permit the ends of said corner posts to be removed from the open ends of said legs and said end frames to thereafter be pivotally folded atop said platform while still being lockingly affixed to said base member, said means defining said retaining recess each comprises a U-shaped member affixed to said leg with the arms thereof depending downwardly so as to form a retaining recess closed at its upper end, said lock members each comprising a length of flat bar stock which is bent U-shaped and has one leg thereof fixedly secured to a corner post of the end frame, the other leg thereof forming said locking flange and being proportioned to be slidably retained within said retaining recess formed by said U-shaped member.

3. The rack of claim 2, wherein one leg of each of said U-shaped members is shortened to provide an opening whereby said locking flange can be disengaged from said retaining recess to permit said end frames to be removed.

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