United States Patent

[11] 3,584,744

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[21] Appl. No. **764,279**
[22] Filed **Oct. 1, 1968**
[45] Patented **June 15, 1971**

[54] **RACK CONSTRUCTION FOR CUPS AND GLASSES**
6 Claims, 14 Drawing Figs.

[52] **U.S. Cl.** **211/71,** 211/126
[51] **Int. Cl.** **A47l 15/50**
[50] **Field of Search** 211/71, 74, 41, 126; 220/21; 229/15; 217/18, 21; 85/5

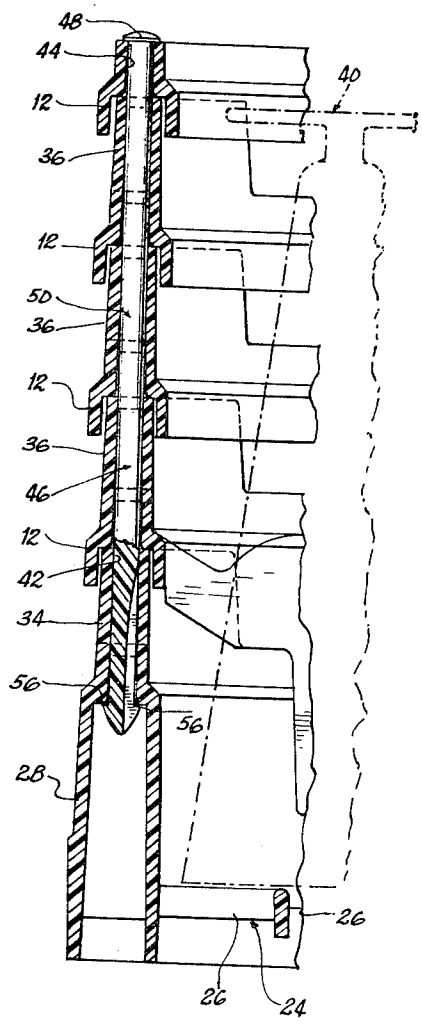
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ABSTRACT: A rack for supporting cups and glasses comprising a flat bed defining an upstanding peripheral wall. A gridwork is supported on the wall, the gridwork including upper portions in a plane spaced apart from the flat bed and defining openings for receiving the cups and glasses. The gridwork is composed of two sets of dividers with the dividers in one set being perpendicular to the dividers of the other set. Each of the dividers comprises a relatively thin panel having a substantial vertical dimension and defining a scalloped upper edge with the low points of the edges being located at intersections of the respective panels and the high point of said edges being located intermediate adjacent intersections. The rack construction preferably includes additional frame members which are interposed between the bed and the frame supporting the dividers whereby variations in the height of the construction can be accomplished.



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SHEET 1 OF 3

FIG. 1

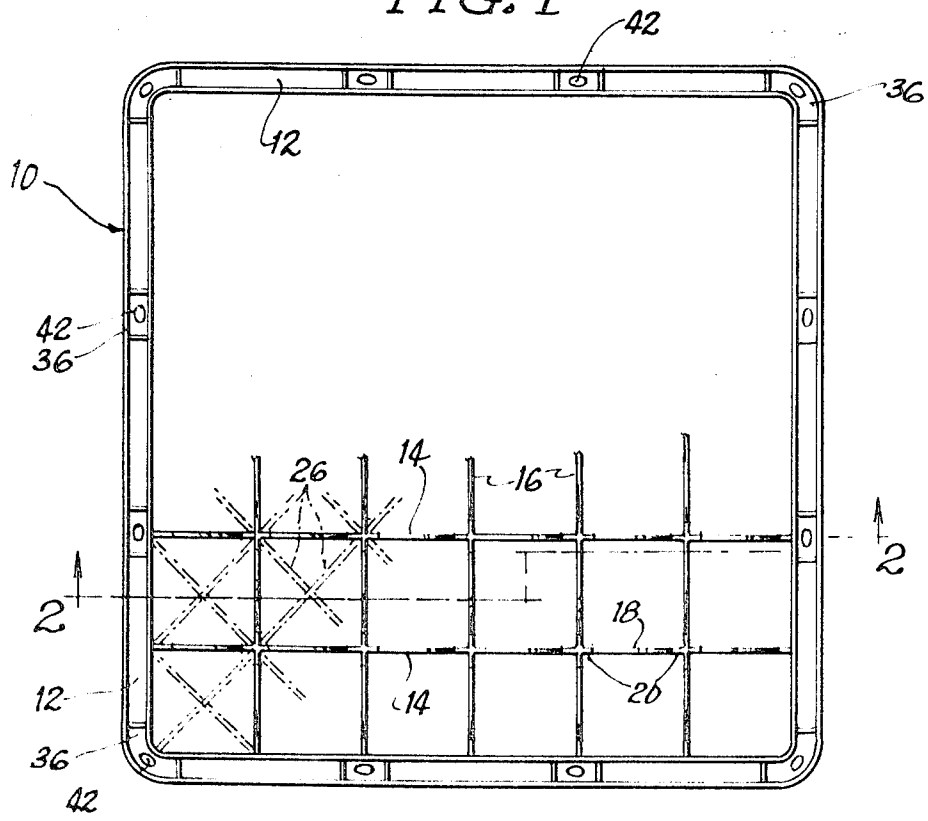


FIG. 2

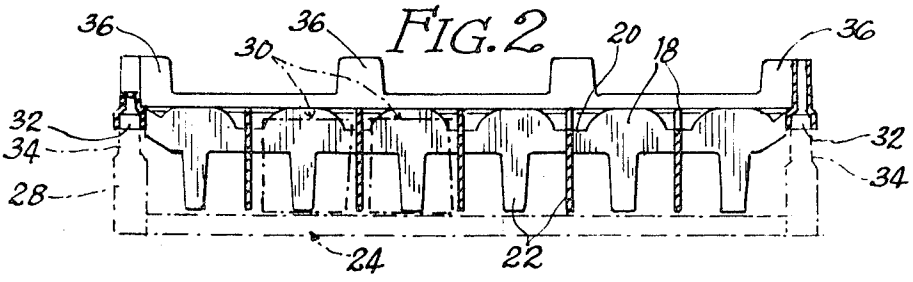


FIG. 3

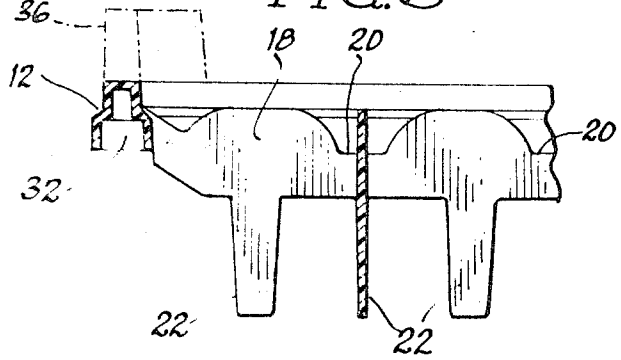
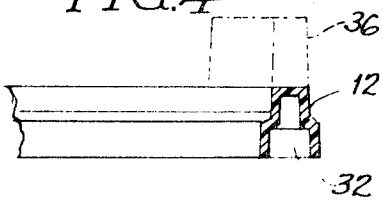


FIG. 4



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FIG. 5

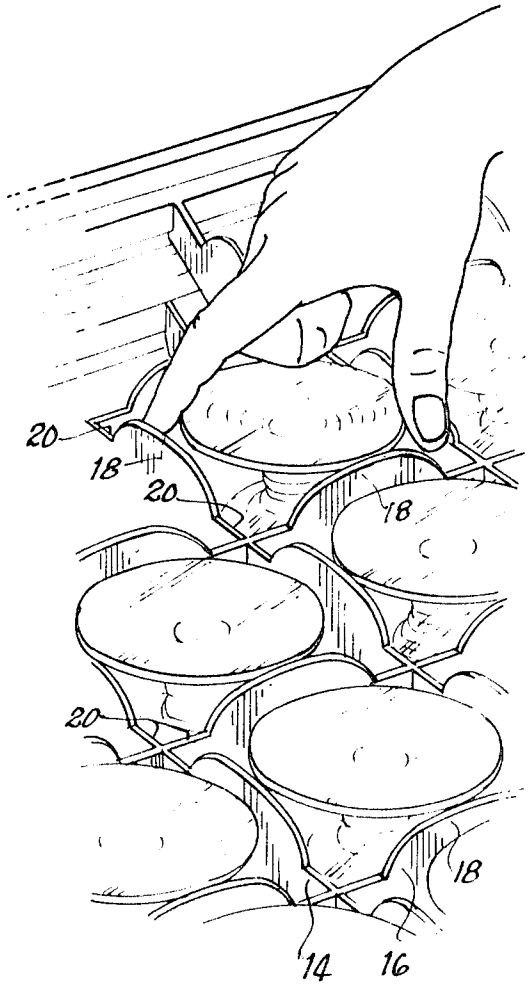


FIG. 10

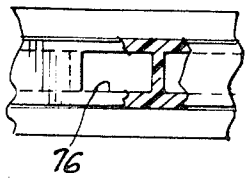


FIG. 11

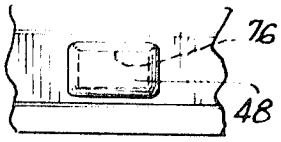


FIG. 9

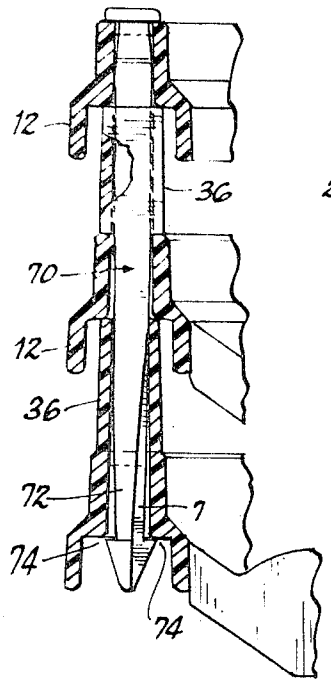


FIG. 12

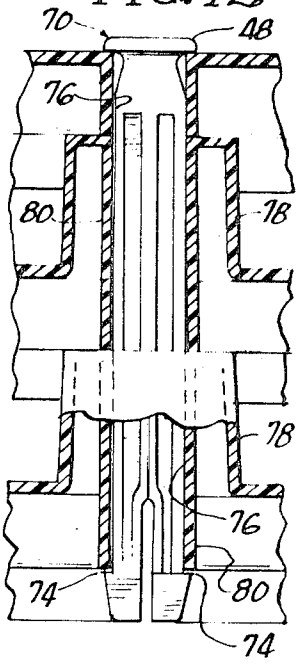


FIG. 13

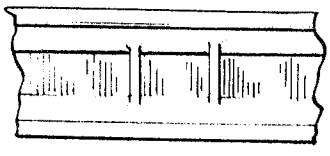


FIG. 14

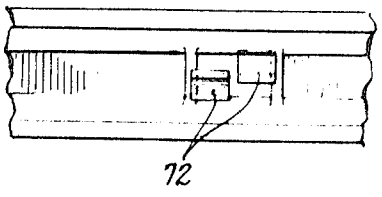


FIG. 6

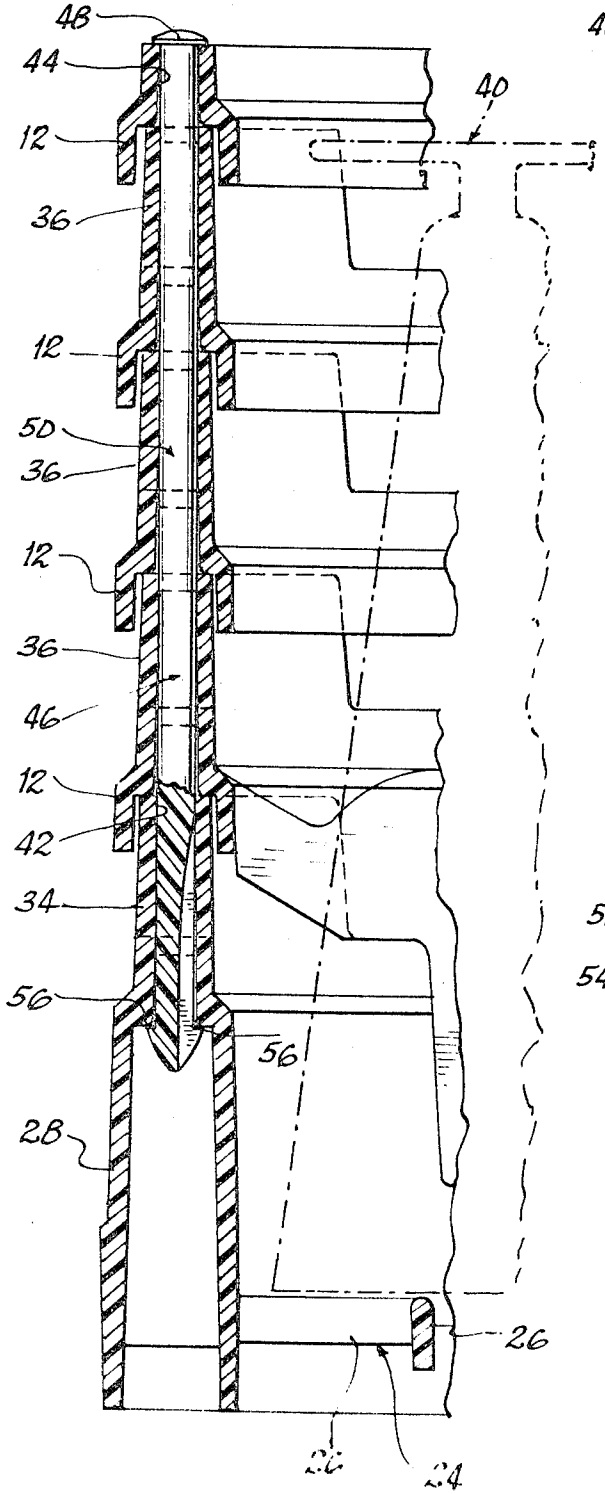


FIG. 7

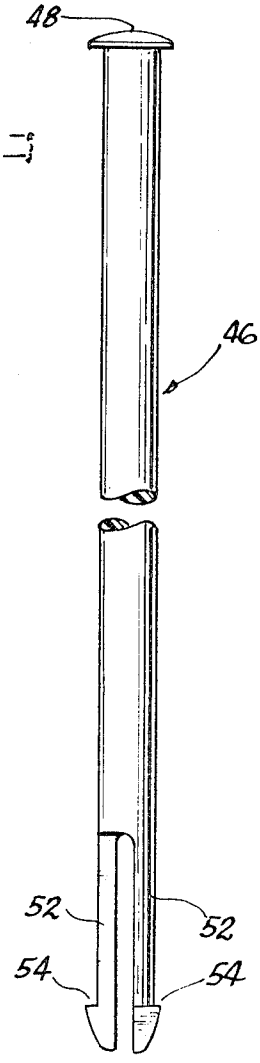
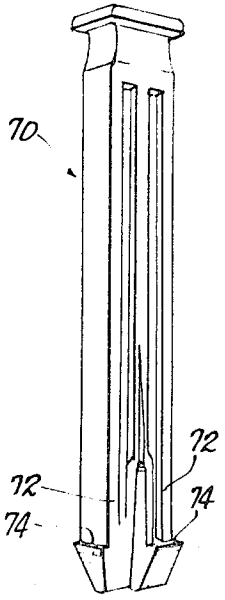


FIG. 8



RACK CONSTRUCTION FOR CUPS AND GLASSES

This invention relates to a rack construction particularly designed for the supporting of cups and glasses. The rack construction is preferably of a type suitable for use in automatic dishwashing equipment. With such racks, dirty dishes can be stored in the racks, transported through the dishwashing equipment while remaining in the racks, and then stored until they are ready to be used again, while still remaining in the racks.

In the design of racks of the type described, there are certain factors which must be taken into consideration. The racks should be relatively inexpensive since large numbers are used, for example, in cafeteria and large restaurant operations. Molded plastic racks are best suited for economical production, and it is particularly desirable to provide racks which can be assembled into individual units so that users of the racks will not have any assembly operations to perform once the racks are initially put together.

It is also necessary to provide racks which will adequately protect the glasses and cups. Since these dishes come in various sizes, it has been necessary to produce racks of corresponding sizes to provide for adequate protection. In many cases, this has necessitated the provision of a variety of molds which, of course, adds to the cost of the racks.

Finally, the racks must be such that the cups and glasses can be efficiently inserted and removed. This becomes a problem when the height of the dishes approximates the height of the gridwork defining the openings for receiving the dishes. The gridwork often interferes with the fingers to make removal of the dishes difficult.

It is a general object of this invention to provide an improved rack construction which is particularly suitable for the handling of glasses, cups and the like.

It is a more specific object of this invention to provide a rack construction which is characterized by a design which permits the efficient production of racks of varying sizes from molded plastic parts whereby adequate protection can be provided for dishware stored in the racks without necessitating an undue investment in molds and other equipment necessary for producing the racks.

It is a still further object of this invention to provide a unique gridwork arrangement for a rack construction which greatly simplifies the handling of dishware to be stored in the racks from the standpoint of insertion and removal of the dishware.

These and other objects of this invention will appear hereinafter and for purposes of illustration, but not of limitation, specific embodiments of the invention are shown in the accompanying drawings in which:

FIG. 1 is a plan view of a gridwork construction characterized by the features of this invention;

FIG. 2 is a cross-sectional view of the gridwork construction taken about the line 2–2 of FIG. 1;

FIG. 3 is an enlarged fragmentary cross-sectional view illustrating details of the gridwork construction;

FIG. 4 is an enlarged fragmentary cross-sectional view illustrating the gridwork supporting frame of the gridwork construction;

FIG. 5 is a fragmentary perspective view of the gridwork construction;

FIG. 6 is an enlarged cross-sectional view illustrating the manner in which the gridwork construction can be included in an assembly with other constructions and with a supporting frame;

FIG. 7 is an elevational view of a connecting pin utilized in assembling the gridwork constructions and supporting frame;

FIG. 8 is a perspective view of an alternative form of connecting pin;

FIG. 9 is a fragmentary, vertical sectional view illustrating use of the pin shown in FIG. 8;

FIG. 10 is a fragmentary plan view, partly cut away, illustrating the pin receiving openings in the constructure;

FIG. 11 is a fragmentary plan view showing the pin in place;

FIG. 12 is an additional vertical sectional view illustrating use of the connecting pin of FIG. 8; and,

FIGS. 13 and 14 comprise fragmentary bottom plan views with and without the pin construction.

The rack construction of this invention generally comprises a supporting frame defining a flat bed. A gridwork is supported over this bed with the dividers of the gridwork being disposed in spaced apart relationship with respect to the bed to thereby define a plurality of openings for receiving cups and glasses.

The gridwork dividers each comprises a relatively thin panel having a substantial vertical dimension. Each panel defines a scalloped upper edge with the low points of the edges being located at intersections of the respective panels and with the high points of said edges being located intermediate adjacent intersections. The dividers are provided in two sets with each divider in a set being in spaced apart parallel relationship with the other dividers and with the respective sets being perpendicular to each other.

The supporting bed preferably includes upstanding posts which are received by the frame supporting the dividers. In order to provide racks of various heights, additional frames may be interposed between the divider carrying frame and the supporting bed. These additional frames also include posts to be received in the divider carrying frame, and the additional frames may also have dividers associated therewith.

The assembly of the divider carrying frame, any additional frames, and the supporting frame is efficiently accomplished by providing holes in the top rails or posts defined by the respective frames. Locking pins can be inserted in these openings, and as will be described, these locking pins snap into place to provide the desired assembled relationship.

FIG. 1 illustrates a frame 10 which includes a peripheral rail 12 and a plurality of dividers 14 and 16. The dividers 14 extend in parallel relationship between two opposed rails, and the dividers 16 are likewise disposed in parallel relationship while extending between the other set of opposed rails.

As shown in FIGS. 2, 3 and 5, the dividers 14 and 16 each comprise thin panels having a scalloped upper edge. This results in a plurality of panel portions 18 which curve downwardly to low points 20. The divider panels also include downwardly extending legs 22 which define the sidewalls of openings in the gridwork.

The gridwork is adapted to be supported over a flat bed 24. This bed is defined by means of a plurality of crisscrossing members 26 which extend between the sidewalls 28 of the bed construction. The members 26 and peripheral sidewalls 28 comprise a conventional arrangement insofar as constructions for dishwashing equipment are concerned. It will be appreciated that the openings provided between the members 26 are intended to permit free flow of water while also providing a supporting bed for dishware included in the openings defined by the gridwork dividers. FIG. 2 illustrates glasses 30 which are included within these openings and which are supported on the bed 24.

The rails 12 comprise hollow rims 32 which receive posts 34 extending upwardly from the sidewalls 28 of the supporting bed. These posts 34 correspond with the posts 36 defined by the rails 12. The posts preferably extend completely around the construction at spaced intervals to provide for adequate support while also providing adequate openings for free flow of the washing liquids.

As suggested in FIGS. 3 and 4, the provision of the posts 36 on the rails 12 is not required. Specifically, the posts 36 need not be included unless an additional frame is to be supported on the construction. Thus, the posts 36 are provided in an arrangement such as shown in FIG. 6 wherein a plurality of frames are built upon each other to increase the height of the rack construction. It will be understood when considering FIG. 6 that the provision of divider members for each of the frames is not required. Thus, the divider members are preferably always provided for the uppermost frame but need be provided for the low frames only for purposes of maintaining the dishware separated while being stored in the construction.

FIG. 6 specifically illustrates the supporting bed 24 defined by the crisscrossing members 26. These members extend between the sidewall 28, and posts 34 extend upwardly from this sidewall. A rail 12 receives this post, and additional posts 36 extend upwardly from this rail. Additional rails 12, and posts 36 provide a further buildup of the construction. Finally, the upper rail 12 defines the top edge of the construction, and it will be noted that a post 36 is not required for this rail. The buildup arrangement of FIG. 6 is desirable for the handling of pilsner glasses or other unusually large dishes.

Each of the posts 34 and 36 defines an oval-shaped opening 42. A corresponding opening 44 (FIG. 6) is defined by the upper rail 12. When an assembly is provided as illustrated in FIG. 6, the openings 42 and 44 are aligned.

The pin 46 shown in FIGS. 6 and 7 may be provided for securing the assembly together. The pin includes a head portion 48, an oval-shaped shank 50 and a bifurcated end portion formed of arms 52. Each of the arms 52 includes an enlarged end 54.

When the various frames are mounted in position, the pin 46 is adapted to be forced through the openings 42 and 44. Since each of the posts and frames have hollow interiors, free passage for the pin is provided.

The pins are preferably formed of a flexible plastic material, and it will be appreciated that the design of the end portions of the pin will permit forcing of the end portions through the various openings. Thus, the arms 52 will bend relative to each other from the front and back as well as side to side.

When the end portions 54 reach the end of the passage defined by the various openings, these end portions will lock on shoulders 56 defined in the interior of the sidewall 28. Accordingly, the pins will be locked in place, and it will be appreciated that only a very simple maneuver is required to achieve this.

It will be noted that the length of the pins 46 will depend upon the size of the assembly. Obviously, a stock of pins can be provided which will accommodate various combinations of frames to achieve assembly, depending upon the height desired.

FIGS. 8 through 14 illustrate an alternative form of the invention wherein a pin 70 is employed for connecting the various frame members together. This pin includes bifurcated ends 72 defining shoulder portions 74. The pin is rectangular in cross section, and is adapted to be received in vertically extending rectangular openings 76 defined by the respective racks.

As best shown in FIG. 12, the openings 76 are defined in the post portions 78 of the racks. Downwardly extending walls 80 are provided for each of the openings so that guide means will be provided for the pins. The length of the pins is determined, depending upon the number of frame sections to be interconnected. The shoulder portions 74 will provide firm gripping of the pins relative to the bottom edge of the bottommost frame section. The walls 80 in the upper and intermediate frame sections engage the upper surface of the post 78.

A distinct advantage of the rack construction described relates to the handling of dishware included in the rack. Thus, glasses and cups can be inserted in the racks whereby they will be completely surrounded by the dividers to provide maximum protection. As illustrated in FIGS. 2, 5 and 6, the bottoms of the glasses 30 and 40 are not exposed above the top edges of the dividers so that they will not be damaged, for example, if another rack or other object should be placed on top of a loaded rack.

At the same time, the glasses 30 and 40 are easily accessible for removal from the rack. The glasses can be grasped with the fingers without difficulty due to the scalloped design of the dividers. As shown, this scalloped arrangement provides depressions or open areas at each intersection of the dividers, and by placing the fingers at these locations, the glasses can be reached without difficulty.

There has been described a rack construction which is characterized by a relatively simple arrangement from the standpoint of production costs and assembly efficiency. Furthermore, the rack construction of this invention provides for maximum protection of dishware stored in the racks while also providing for highly efficient operation, particularly when the racks are unloaded.

It will be understood that various changes and modifications may be made in the above described constructions which provide the characteristics of this invention without departing from the spirit thereof particularly as defined in the following claims.

I claim:

1. In a rack for supporting dishware including glasses, cups and the like whereby the dishware can be held in the rack and thereby efficiently moved from place to place, stored, and transported through a dishwashing machine, said rack comprising a flat bed, said bed defining a plurality of openings for the free flow of fluids therethrough, and a gridwork, said gridwork defining openings for receiving said dishware, the improvement wherein said gridwork comprises two sets of dividers, the dividers of each set being disposed in spaced-apart parallel relationship with the dividers of one set being perpendicular to the dividers of the other set whereby a plurality of dishware receiving openings are defined by the dividers, and wherein each of said dividers comprises a relatively thin panel having a substantial vertical dimension, each panel defining a scalloped upper edge with the low points of said edges being located at intersections of respective panels and the high point of said edges being located intermediate adjacent intersections, a frame, said dividers being attached at their opposite ends to said frame, and including upstanding posts formed around the periphery of said bed, and means connecting said frame to said posts, at least one additional frame member interposed between said bed and the frame supporting said dividers, said additional frame member being supported on the posts formed around said bed, and including upstanding posts formed on said additional frame member, openings defined by said frame and corresponding openings defined by said posts, pins extending through the respective openings for securing said frame to said posts, the openings defined by the frame having their respective bottom ends terminating adjacent the entry ends of the corresponding openings in the underlying posts of said additional frame member to provide passageways for said pins and to provide guide means during attaching of the pins to the construction.

2. A construction in accordance with claim 1 wherein said dividers are formed integrally with said frame.

3. A construction in accordance with claim 1 wherein at least some of said posts are located intermediate the corners of said frame.

4. A construction in accordance with claim 1 including openings defined by said frame and corresponding openings defined by said posts, and including pins extending through the respective openings for securing said frame to said posts.

5. In a rack for supporting dishware including glasses, cups and the like whereby the dishware can be held in the rack and thereby efficiently moved from place to place, stored, and transported through a dishwashing machine, said rack comprising a flat bed, said bed defining a plurality of openings for the free flow of fluids therethrough, and a gridwork, said gridwork defining openings for receiving said dishware, the improvement wherein said gridwork comprises two sets of dividers, the dividers of each set being disposed in spaced-apart parallel relationship with the dividers of one set being perpendicular to the dividers of the other set whereby a plurality of dishware receiving openings are defined by the dividers, and wherein each of said dividers comprises a relatively thin panel having a substantial vertical dimension, each panel defining a scalloped upper edge with the low points of said edges being located at intersections of respective panels and the high point of said edges being located intermediate adjacent intersections, a frame, said dividers being attached at their opposite ends to said frame, and including upstanding posts formed around the periphery of said bed, and means connecting said frame to said posts, at least one additional

frame member interposed between said bed and the frame supporting said dividers, said additional frame member being supported on the posts formed around said bed, and including upstanding posts formed on said additional frame member, openings defined by said frame and corresponding openings defined by said posts, pins extending through the respective openings for securing said frame to said posts, passageways defined by downwardly extending walls formed in the interior of said posts, said passageways being dimensioned to correspond with the cross-sectional dimensions of said pins to thereby provide guide means during attaching of the pins to the construction.

6. A construction in accordance with claim 5 wherein said pins define bifurcated ends comprising opposed locking arms, each of said arms defining an enlarged end portion for locking engagement with the bottom surface for the construction defined at the ends of said passageways and whereby said arms are adapted to be bent inwardly to permit passage of the pins through said passageways with the arms snapping outwardly into said locking engagement when the enlarged ends have moved beyond the ends of the passageways.