May 19, 1953 W. R. WALKER 2,638,910

RACK FOR DISHWASHERS

Filed Aug. 16, 1948 2 Sheets-Sheet 1

FIG. 1.

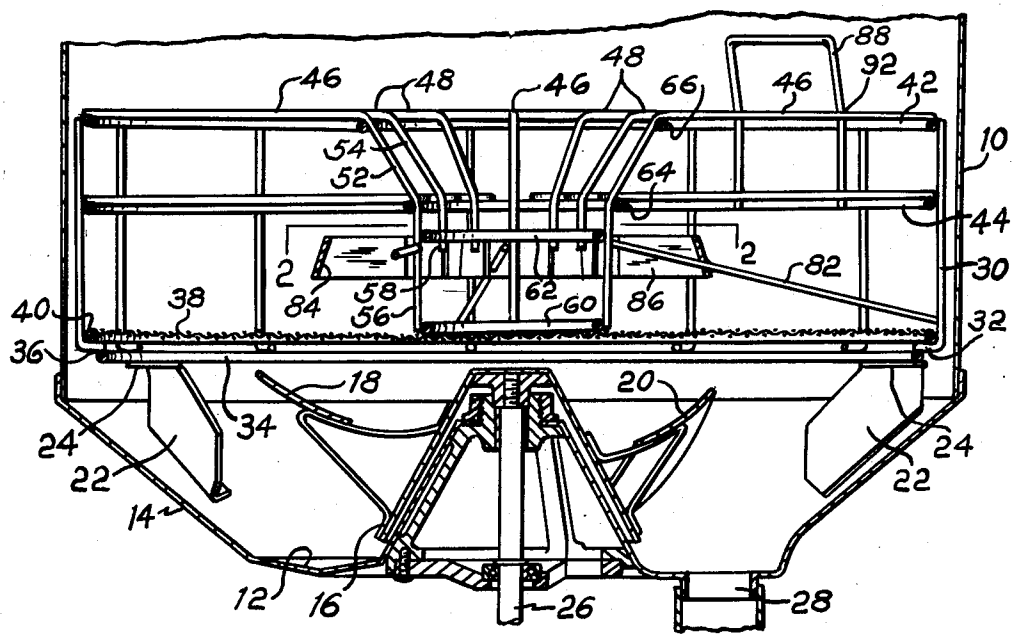


FIG. 3.

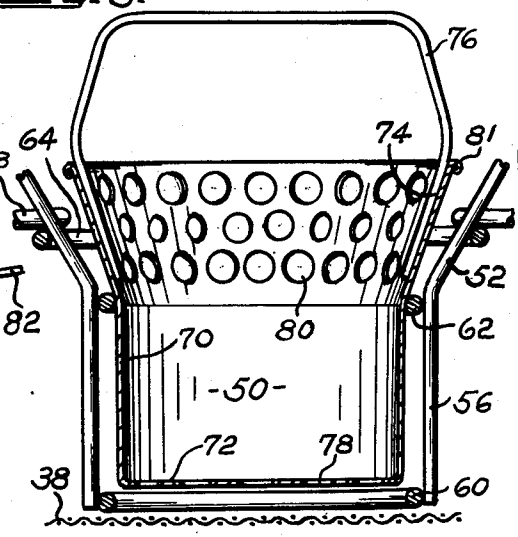
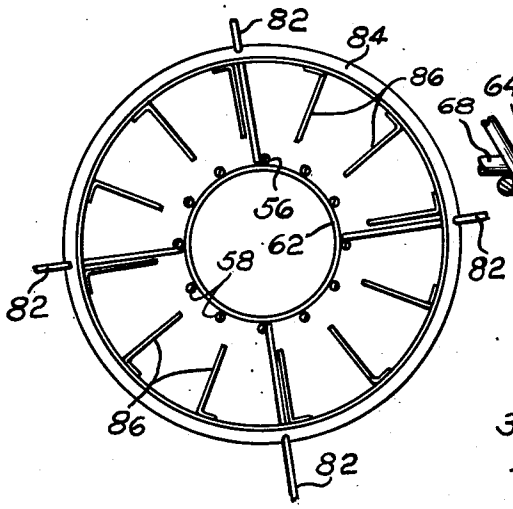


FIG. 2.



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Filed Aug. 16, 1948 2 Sheets-Sheet 2

FIG. 4.

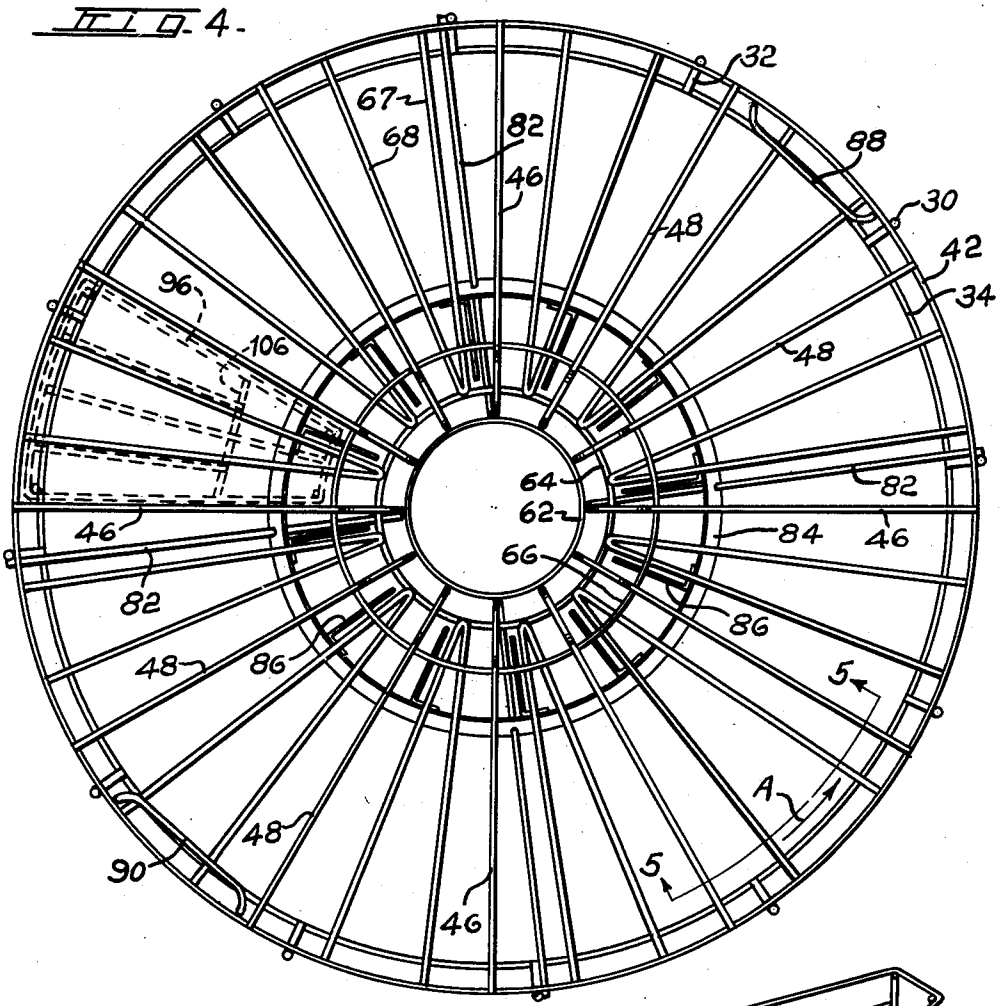


FIG. 6.

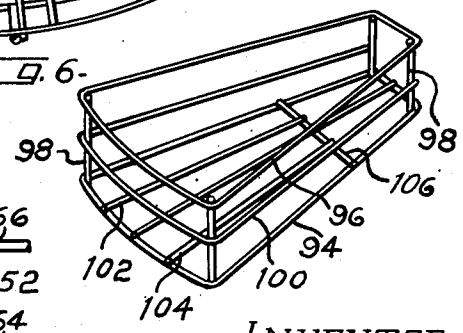
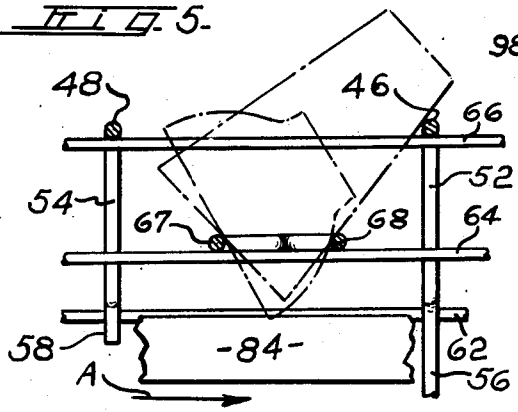


FIG. 5.



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2,638,910

RACK FOR DISHWASHERS

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Application August 16, 1948, Serial No. 44,542

14 Claims. (Cl. 134—182)

1

This invention relates to dish washing apparatus, and more particularly to racks therefor especially adapted to hold vessels such as cups and glasses and small items, in suitable position for efficient flush washing thereof.

Racks of the type described are generally composed of wire formed into suitable framework secured by fusion, soldering or mechanical means such as crimping and looping, and are generally complicated in that the various members do not actively participate in the support of the various items as well as lend rigidity and strength to the structure.

Accordingly, an object of the present invention is to provide a rack of the general class set forth embodying simplicity of structure, and utilizing so far as possible the various members to both provide rigidity and strength and utility in the forming of pockets and racking facilities for the dishes to be held.

A further object of the invention is to provide a structure comprising relatively simple sub-assemblies which may be easily brought together for completion and assembly of the rack.

Still a further object of the invention is to provide a rack adapted to hold deep dishes for efficient washing action and in proper relation to the surge of washing fluid of the dish washing apparatus to which the rack is adapted.

The above and other novel features of the invention will appear more fully hereinafter from the following detailed description when taken in conjunction with the accompanying drawings. It is expressly understood that the drawings are employed for purposes of illustration only and are not designed as a definition of the limits of the invention, reference being had for this purpose to the appended claims.

In the drawings, in which like reference characters indicate like parts:

Figure 1 is a vertical sectional view of the basket shown in its relative position with respect to impeller type washing apparatus;

Figure 2 is a section taken substantially on the line 2—2 of Figure 1;

Figure 3 is an enlarged view of a silver container shown mounted in the central portion of the basket of Figure 1;

Figure 4 is a top plan view of the basket with the wire screen eliminated for sake of clearness;

Figure 5 is an arcuate section taken substantially on the line 5—5 of Figure 4; and

Figure 6 is a perspective view of a small segmental basket adapted for positioning in the circular basket as indicated in Figure 4.

In Figure 1, there is shown a tub comprising a cylindrical side wall 10 with attached bottom formed to provide a substantially annular channel 12 bounded exteriorly by a conical wall 14. Over the channel is rotatably positioned an impeller 16. The impeller is provided with blades or vanes 18 and 20 which preferably sweep different paths radially and axially with respect to one another, and are so pitched as to forcefully direct wash fluid over the outer annular area of the tub and the inner annular area of the tub, respectively.

2

Suitable basket supports in the form of vanes 22 are provided, the same being secured to the conical wall 14 and being provided with angular flat bearing faces 24 to support a basket thereupon. A plurality of vanes are employed substantially uniformly spaced angularly around the conical wall 14 and act to return wash fluid to the annular trough 12 for subsequent forceful flush distribution thereof upwardly by the impeller blades 18 and 20. It will be understood that the impeller is driven by a motor direct-connected or otherwise to the shaft 26, and that the drain outlet 28 will be normally closed by a valve (not shown) during washing operation. The foregoing construction is shown more in detail in a copending application Serial No. 15,985, filed March 20, 1948.

The basket or rack shown is particularly designed to accommodate deep vessels such as cups, glasses and the like, and silverware; and in normal operation of the dish washing machine shown, will be utilized preferably for this purpose, there being a second tray provided for suitably racking flat dishes such as plates, saucers, platters and the like. The basket is preferably formed of relatively stiff wire, and the peripheral portion thereof comprises a plurality of upright members 30 having a radially inward bend 32 at the lower ends thereof connected by a bottom ring 34 secured to the lower ends as at 36 by brazing, silver soldering, welding or the like. The upper ends of the uprights 30 are secured to a wire ring 42 and there is also positioned a wire ring 44 a suitable distance below the ring 42, both being secured by suitable means such as welding or the like to the uprights 30. In the angle formed between the upright portions 30 and the radially inward portions 32 is arranged a wire ring 40 for supporting a screen 38 formed of interwoven wires arranged at right angles to each other, the mesh being of the order of four or five to the inch. Such screen is secured by welding, brazing or soldering to the wire ring 40 positioned in the angle so formed, the wire being welded or otherwise secured to the upright members 30.

The wire sub-assembly composed of radially extending wires 46 and 48 divide the top of the rack into twelve sectors and depending portions of such wires at the inner ends are adapted to form a central frame within which a silver-receiving receptacle 50 (see Figure 3) may be supported. The wires 46 and 48 each have inclined portions 52 and 54, respectively, and ver-

tically depending end portions 56 and 58, respectively. It will be observed that the wires 46, with the depending portions 56, are preferably four in number, and extend to substantially the level of the wire meseh 38 and are bound with respect to one another by securing to a wire ring 60. The portions 56 and 58 of the wires 46 and 48 are bound together by a second wire ring 62 disposed a substantial distance above the ring 60. In the knee formed by the portions 52 and 56 of the wires 46 and the portions 54 and 58 of the wires 48, is an exterior wire ring 64 which is suitably secured to the wires 46 and 48 by welding or other suitable means. There is also provided in the knee formed between the radial portions of the wires 46 and 48 and end portions 52 and 54, a wire ring 66 likewise suitably welded or otherwise secured to each of the wires 46 and 48.

It will be noted that the wire ring 64 and the wire ring 44 are arranged substantially on the same level, and intermediate each adjacent pair of wires 46 and 48 or 48 and 48 as the case may be, there is arranged upon the rings 64 and 44 a pair of wires 67 and 68 forming a V in which the rim of cups or glasses may be held. Such V members serve to torsionally brace the entire assembly. So far as cups are concerned, no further support need be required to hold such cups in angular relation to the horizontal plane and vessels such as glasses are held by positioning a portion of the rim thereof between such V's, the up-ended bottom of such vessels resting against one of the wires 46 or 48 (see Figure 5).

The silver receptacle 50 comprises a lower substantially cylindrical wall 70, a perforated bottom wall 72 and a flared and perforated upper wall 74. A suitable wire handle 76 is secured to the flared portion of the receptacle and the dimensions of the receptacle are such that when in position, the flared portion will engage the wire ring 62. Such receptacle is readily removed from the rack and replaced, and the perforations 76 in the bottom thereof and 80 in the flared portion thereof are such as to permit substantial flushing of wash water therethrough.

The basket thus described is braced by diagonal wires 82 lying substantially in axial planes, there being utilized preferably in practice four of such wires extending angularly from a relatively low point upon the edge of certain of the upright wires 30, to the respective depending wires 56 at a higher point so as to provide suitable diagonal braces.

Distribution of wash fluid upwardly flushed by the impeller blades 18 and 20 within the silver rack is improved by a deflector ring 84 formed of a band of metal conically formed. The band of metal is supported on the diagonal braces 82, the latter passing through apertures in the band 84 and being welded or otherwise secured at the point of intersection. The deflector ring 84 is provided with a plurality of radially inwardly directed vanes 86 which tend to deflect the swirling upward movement of wash fluid thrown thereagainst by the impeller blade 20 and assist in directing the same into the silver container 50 through the ports 80 and also around the rim 81 of the silver container so as to impinge upon the exposed ends of silver placed within such container and projecting outwardly above the rim thereof. It will be understood that in practice, silver will be placed within the container with the handles preferably down and in engagement with the bottom, and that the container will be of such depth as to support such silver with the knife blades, fork tines and spoon bowls extending outwardly above the rim 81, but the apertures in the bottom and flare will provide for a substantial flush of such implements at the base of the various handles as well.

The rack is provided with a pair of handles 88 and 90 which may be inwardly bent as at 92 to facilitate lifting the basket from the wash tub 10, although the basket is fitted rather closely to the cylindrical wall 10.

In order to hold miscellaneous small items within the basket, such as bar glasses, can openers and small implements or the like, a sector shaped tray, such as is shown in Figure 6, may be provided. Such sector trays may have a plurality of top and bottom trapezoidal shaped wire frames 94 and 96 joined by vertical wires 98 at the corners. Such frame may be provided with additional intermediate wires such as 100 around the radial side walls and arcuate base thereof, and a plurality of radially arranged wires such as 102 and 104 reinforced by a chordal member 106 may be arranged along the bottom to provide a grille of sufficiently fine mesh to support such objects as described. Such basket may be, if desired, covered with mesh screen of, for example, four mesh to the inch, the screen covering the bottom and having sides folded up and joined to the top wire frame member 96. Such segmental tray is so designed in shape as to fit between adjacent wires 48 or 48 and 46.

In loading the glassware and cups upon the V sides 67 and 68, it will be preferable to incline such cups in a uniform direction progressively around the basket such that wash water impelled upwardly by the blades 18 and 20 will be thrown upwardly into such cups and glasses. The rotational direction of the impeller with respect to glasses properly arranged is represented by the arrow A in Figures 4 and 5, and as so arranged, the blades 18 and 20 will provide a flush of water upwardly directed and swirling in the direction of the arrow A. As previously explained, the blades 18 and 20 are suitably designed to drive water in an outward annular area and an inward annular area, respectively, so as to cover substantially the entire area above the mesh screen 38.

It will be seen from the foregoing that a rack is provided which is capable of holding deep vessels and small items in a position for advantageous action of the upwardly surging and swirling wash water, and that provision is made for holding all such small items as are usually presented for washing. Supporting such vessels at a sharp angle to the vertical, assists drainage of wash fluid therefrom, there being no pockets that do not drain, or horizontal surfaces to retain wash water, as is evident from a consideration of Figure 5.

While the upright members 30 have been shown slightly displaced angularly from the horizontal members 46 and 48, for sake of illustration and for ease of welding or brazing, without interfering with the previously brazed connections between the upright members 30, and the ring 42, such horizontal members 46 and 48 could be integral extensions of the upright members 30. In any event, such displacement does alter the structure to the extent that the members 30, 46, 52 and 56 and braces 82 form a substantially radial frame, interconnecting and forming a part of inner and outer cylindrical grilles formed by such members and the large circular rings 34, 44 and

42, and small rings 60, 62, 64 and 66. As shown, the outer circular grid including upright elements 30 and screen 38 may be formed, the inner grid with the elements 46 and 48 formed and assembled upon the outer grid, and thereafter the deflector 84 fixed in position by assembly of the brace wires 82.

Thus, it will be seen that the structure is readily assembled and lends itself to mass production and the use of a minimum of jigs. At the same time, a rigid wire framework is provided which may be fabricated by the securing methods set forth or such other methods as may be applicable to the material chosen for the fabrication of the frame.

Although a single embodiment of the invention has been illustrated and described, it is to be understood that the invention is not limited thereto. As various changes in the construction and arrangement may be made without departing from the spirit of the invention, as will be apparent to those skilled in the art, reference will be had to the appended claims for a definition of the limits of the invention.

What is claimed is:

1. A dish rack comprising a plurality of wire frames radially arranged and lying substantially in radial planes, each of said frames being composed of horizontally disposed elements, peripherally disposed vertical elements, and centrally disposed elements defining an aperture to receive a silver-receiving vessel, and certain of said frames having diagonally disposed brace members lying substantially in the vertical plane of the respective frame, and extending between said circumferential and central vertical elements, and a plurality of circular members of large and small diameters lying in spaced planes connecting said peripherally disposed elements and said centrally disposed elements, respectively.

2. A dish rack comprising a plurality of wire frames each substantially radially arranged in a radial plane, each of said frames being composed of substantially horizontally disposed elements, peripherally disposed vertical elements, centrally disposed elements defining an aperture to receive a silver-receiving vessel, a plurality of circular members of large and of small diameter connecting said peripherally disposed elements, and said centrally disposed elements, respectively, a large and a small diameter member lying in each of two spaced planes, and V members connecting the large and small diameter members of the lower plane, the apices of said V-members being connected to one of said last-named members and the spaced ends being connected to the other of said last-named members, each of said V-members being disposed between and below adjacent said horizontally disposed elements.

3. A dish rack comprising a plurality of wire frames radially arranged, each of said frames being composed of horizontally extending elements, peripherally disposed vertically extending elements, centrally disposed elements defining an aperture to receive a silver-receiving vessel, and certain thereof having diagonally disposed brace members extending between said circumferential and central elements substantially in radial planes, a plurality of circular members of large and small diameters connecting said peripherally disposed elements and said centrally disposed elements, respectively, and a deflector ring mounted upon said brace members for directing fluid toward said aperture.

4. A dish rack comprising a plurality of wire frames radially arranged, each of said frames being composed of horizontally disposed elements, peripherally disposed vertical elements the lower ends of which lie substantially in a common plane, centrally disposed elements defining an aperture to receive a silver-receiving vessel, certain of said central elements extending downwardly to said common plane, a plurality of circular members of large and small diameter connecting said peripherally disposed elements and said centrally disposed elements, respectively, a large and small diameter member lying in each of two spaced planes, and V members connecting the large and small diameter members of the lower plane, the apices of said V-members being connected to one of said last-named members and the spaced ends being connected to the other of said last-named members.

5. A dish rack comprising a plurality of wire frames radially arranged, each of said frames being composed of horizontally disposed elements, peripherally disposed vertical elements the lower ends of which lie substantially in a common plane, centrally disposed elements defining an aperture to receive a silver-receiving vessel, certain of said central elements extending downwardly to said common plane, and diagonally disposed brace members extending between said circumferential and said certain central vertical elements substantially in radial planes, a plurality of circular members of large and small diameter connecting said peripherally disposed elements and said centrally disposed elements, respectively, and deflector means mounted upon said brace members for directing fluid inwardly of the structure.

6. A dish rack comprising a plurality of wire frames radially arranged, each of said frames being composed of horizontally disposed elements, peripherally disposed vertical elements the lower ends of which lie substantially in a common plane, centrally disposed elements defining an aperture to receive a silver-receiving vessel, certain of said central elements extending downwardly to said common plane, and diagonally disposed brace members extending between said circumferential and said certain central vertical elements substantially in radial planes, a plurality of circular members of large and small diameter connecting said peripherally disposed elements and said centrally disposed elements, respectively, and a plurality of V racking members disposed intermediate said horizontal members and therebelow and interconnecting one each of said large and small circular members at three points and acting to torsionally brace the rack.

7. A dish rack comprising a plurality of wire frames radially arranged, each of said frames being composed of horizontally disposed elements, peripherally disposed vertical elements the lower ends of which lie substantially in a common plane, centrally disposed elements defining an aperture to receive a silver-receiving vessel, certain of said central elements extending downwardly to said common plane, and diagonally disposed brace members extending between said circumferential and said certain central vertical elements substantially in radial planes, a plurality of circular members of large and small diameter connecting said peripherally disposed elements and said centrally disposed elements, respectively, a plurality of V members radially disposed intermediate said horizontal members and therebelow and interconnecting one each of said large and

small circular members at three points, and acting to torsionally brace the rack, and annular deflector means supported beneath said V members.

8. In a dish rack, a plurality of frames lying substantially in radial planes each comprising a top horizontal member, a depending peripheral member, and a depending central member, having the upper portion thereof inclined, said top horizontal members lying in one plane, circular members of small and large diameter lying in spaced horizontal planes connecting said central and peripheral vertical members, respectively, diagonal braces connecting said central and peripheral members, and a plurality of V members secured at their apices to one of said small diameter circular members lying in a lower plane, and at their open ends to one of said large diameter circular members lying in the last-named plane, said V-members being located in a plane beneath the plane of said top horizontal members and positioned angularly intermediate adjacent top horizontal members.

9. In a dish rack, a plurality of frames lying substantially in radial planes each comprising a top horizontal member, a depending peripheral member, and a depending central member having the upper portion thereof inclined, circular members of small and large diameter lying in horizontal planes connecting said central and peripheral vertical members, respectively, diagonal braces connecting said central and peripheral members, and a plurality of V members secured at their apices to one of said small diameter circular members, and at their open ends to one of said large diameter circular members, said V members lying substantially in a horizontal plane disposed below and between adjacent said horizontal members, and bearing such angular relation thereto as to support elongated vessels by the rim thereof in inclined relation to a horizontal plane with the body of said vessels resting on an adjacent horizontal member.

10. In a dish rack, a plurality of frames lying substantially in radial planes each comprising a top horizontal member, a depending peripheral member, and a depending central member, having the upper portion thereof inclined, circular members of small and large diameter lying in horizontal planes connecting said central and peripheral vertical members, respectively, said central members defining a silver container receptacle, diagonal braces connecting said central and peripheral members, an annular deflector supported on said braces surrounding and in spaced relation to said depending central members, and a plurality of V members secured at their apices to one of said small diameter circuliar members, and at their open ends to one of said large diameter circular members, said V members lying substantially in a horizontal plane disposed below and angularly displaced from adjacent horizontal members, and bearing such angular relation thereto as to support elongated vessels by the rim thereof in inclined relation to a horizontal plane with the body of said vessels resting on an adjacent horizontal member.

11. In a dish rack, a plurality of frames lying substantially in radial planes each comprising a top horizontal member, a depending peripheral member, and a depending central member, having the upper portion thereof inclined, circular members of small and large diameter lying in horizontal planes connecting said central and peripheral vertical members, respectively, said central members defining a silver container receptacle,

diagonal braces connecting said central and peripheral members, deflector means including circular and radial vanes surrounding said receptacle and supported on said braces, and a plurality of V members secured at their apices to one of said small diameter circular members, and at their open ends to one of said large diameter circular members, said V members lying substantially in a horizontal plane disposed below and angularly displaced from adjacent horizontal members, and bearing such angular relation thereto as to support elongated vessels by the rim thereof in inclined relation with vessels resting on an adjacent horizontal member.

12. In a dish rack, a plurality of frames lying substantially in radial planes each comprising a top horizontal member, a depending peripheral member, and a depending central member, having the upper portion thereof inclined, circular members of small and large diameter lying in spaced horizontal planes connecting said central and peripheral vertical members, respectively, diagonal braces connecting said central and peripheral members, and a plurality of V members secured at their apices to one of said small diameter circular members, and at their open ends to one of said large diameter circular members, said V members lying substantially in a horizontal plane disposed below and between adjacent said horizontal members, and bearing such angular relation thereto as to define a sector shape receptacle bounded at the top by adjacent horizontal wires and intermediate segments of the uppermost of said small and large diameter circular elements and having a bottom composed of the respective intermediate V members.

13. A cylindrical outer grid, an inner grid, the lower portion of which is cylindrical and the upper portion of which is conical, and horizontal radial connecting members therebetween in an upper plane, V members extending between and secured at three points to said grids in a lower plane each V-member being disposed intermediate adjacent radial connecting members of the upper plane, and a screen extending across the bottom of said outer grid and secured thereto.

14. A cylindrical outer grid, an inner grid, the lower portion of which is cylindrical and the upper portion of which is conical, and horizontal radial connecting members therebetween in one plane, V members extending between and secured at three points to said grids in a lower plane, and members interconnecting said inner and outer grids and extending radially and angularly with respect to said plane.

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