

July 21, 1942.

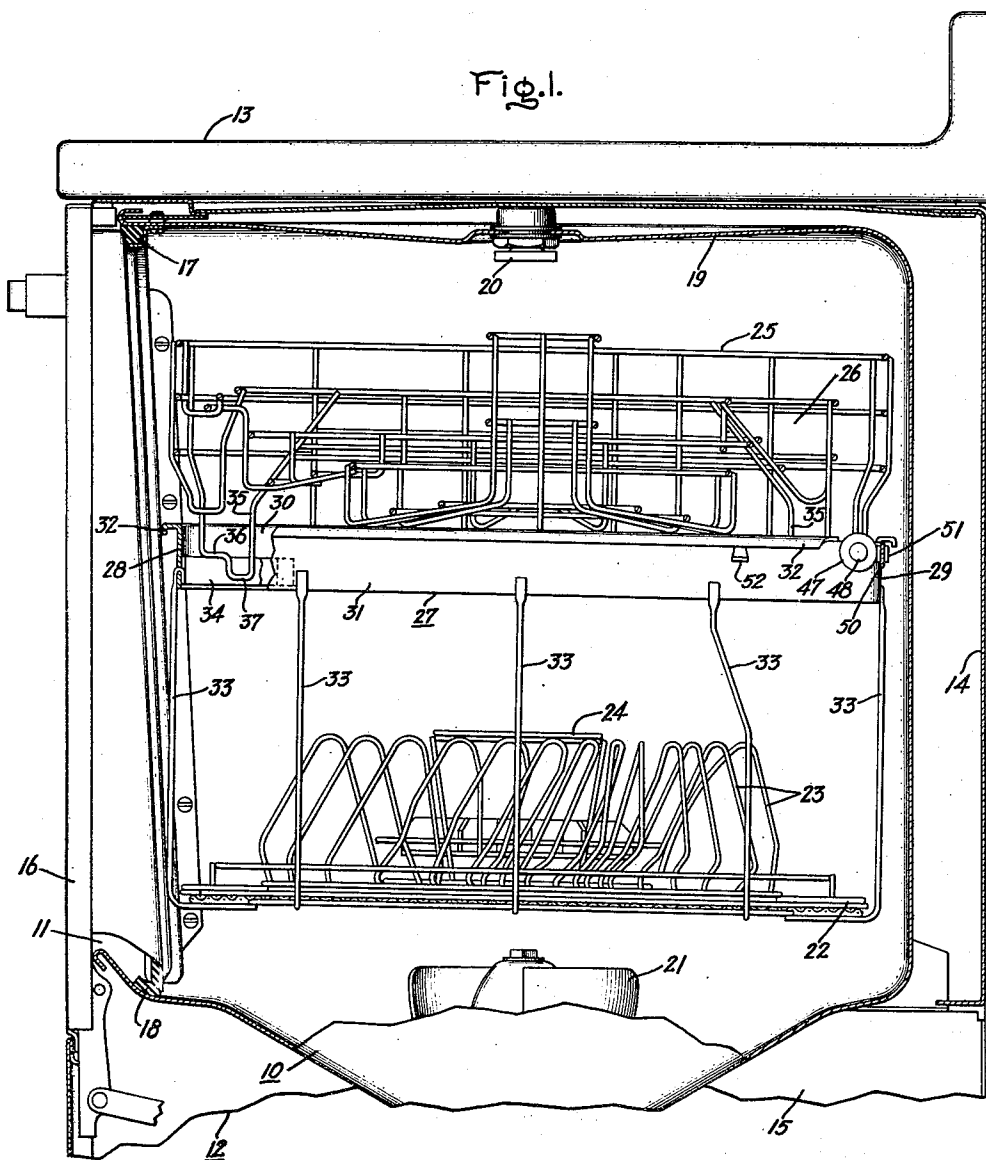
E. S. STODDARD

2,290,653

WASHING APPARATUS

Filed March 5, 1941

2 Sheets-Sheet 1



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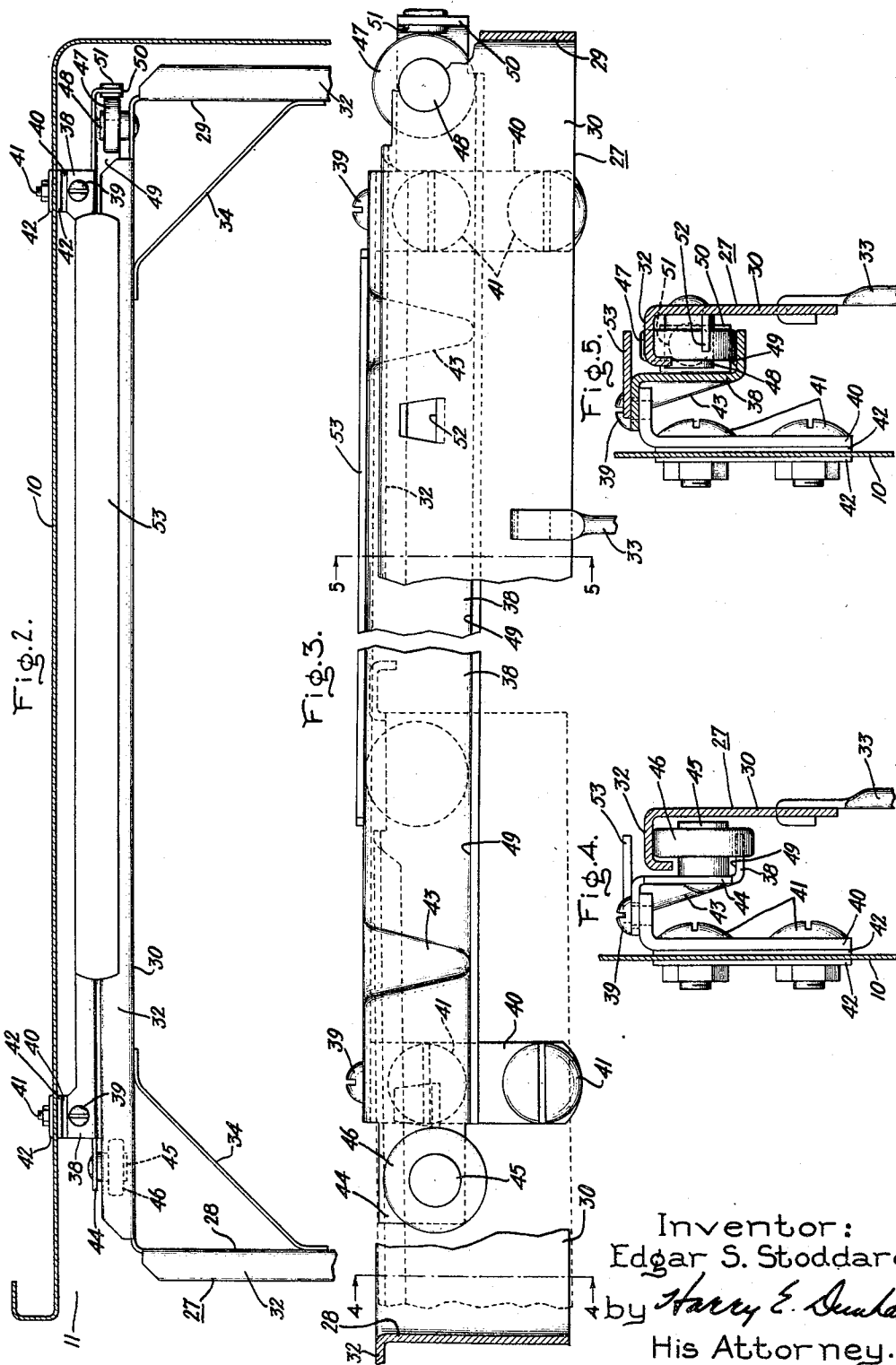
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UNITED STATES PATENT OFFICE

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WASHING APPARATUS

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Application March 5, 1941, Serial No. 381,836

8 Claims. (Cl. 141—9)

This invention relates to a washing apparatus and more particularly to a dishwashing apparatus and has for its object the provision of improved and simplified means for removably supporting dishes to be washed in an apparatus of this character.

This invention relates particularly to a front opening type of dishwasher in which a plurality of racks are provided in the washing space for supporting dishes within the available cubicle contents of the washing space.

It is among the objects of this invention to provide improved means for supporting a plurality of racks in the washing space of a dishwasher so that the racks may be moved as a unit from a loading or unloading position outside of the washing space to a washing position within the washing space; to provide improved supporting means by which the vertical space required by the plurality of racks and their support is reduced to a minimum; to provide a relatively low cost supporting structure by which a plurality of racks may be moved in and out of a washing space easily and without sticking or jamming; to provide a supporting structure for a plurality of racks which may be positioned within the washing space so that washing racks lie above and below the support; and to provide a single supporting structure by which a plurality of racks may be smoothly and easily moved into and out of a washing space without the danger of chipping or breaking of the dishes carried on the rack and with the minimum of rattling of the dishes.

In accomplishing these objects there is provided in accordance with this invention a dishwashing apparatus which includes a washing vat having an opening in one of the side walls thereof through which articles to be washed may be loaded and unloaded. Provided within the washing vat are a plurality of racks comprising a lower dish supporting rack and an upper dish supporting rack and positioned between these racks is a supporting frame. Extending downwardly from said frame are a plurality of means for supporting the lower dish rack and positioned within said frame are a plurality of separate means for firmly yet removably supporting the upper dish rack. On each of the side walls of said vat which lie adjacent the side opening there is provided a rail or trackway for supporting said frame in the washing space of said vat and suitable means are provided for effecting a sliding or rolling relation between the frame and said rails. In mounting the rails on the side walls of the

washing vat they are spaced from both the top and bottom wall of the vat an amount sufficient to permit both the upper and lower racks to be moved in unison into and out of the washing space. Stops are provided for limiting the movement of the racks into and out of the washing space and means are provided for limiting pivotal movement of the rack assembly relative to its support when the assembly is in its extended position. Moreover, in order to facilitate the movement of the loaded racks into the washing space, the trackways are sloped from front to rear and means are provided for cushioning the engagement between the frame and the stop limiting movement of the frame into the washing chamber.

For a more complete understanding of this invention reference should be had to the accompanying drawings in which Fig. 1 is a side elevation, partly in section and partly broken away, showing the improved dish supporting construction of this invention and the support therefor within the vat of a front opening type of dishwashing apparatus; Fig. 2 is a plan view showing one side of the dish rack supporting frame and the support therefor; Fig. 3 is an enlarged side elevation, partly broken away, of the side of the rack supporting frame and the support therefor shown in Fig. 2; Fig. 4 is a sectional view taken on the line 4—4 of Fig. 3 (looking in direction of arrows); and Fig. 5 is a sectional view taken on the line 5—5 of Fig. 3 (looking in direction of arrows).

Referring to the drawings this invention has been shown as applied to a front opening type dishwasher having a vat 10 with a side opening 11 therein. The vat 10 is suitably mounted in a casing 12 having a top wall 13, a rear wall 14, and side walls 15. Pivotaly mounted on the casing 12 is a suitable door 16 for closing the side opening 11 of the vat. Suitable gasket means 17 and 18, which are more fully described and claimed in my copending application, Serial No. 380,852, filed February 27, 1941, and assigned to the assignee of the present invention, are provided for effecting a fluid-tight seal between the door 16 and the opening 11. Provided in the top wall 19 of the vat is a suitable nozzle 20 for supplying washing fluid to the vat and provided in the lower portion of the vat is a suitable power driven fluid circulating means 21.

As is well understood in the art, washing fluid is supplied to the vat through the nozzle 20 and this washing fluid is thrown or hurled upwardly by means of the circulating means 21 so that it

comes in contact with the dishes or other articles to be washed which are supported within the vat.

Provided within the vat 10 is a lower dish supporting rack 22 which comprises a wire assembly having circumferentially spaced projections 23 suitable for supporting relatively large dishes. Arranged within the projections is a wire basket 24 suitable for supporting smaller pieces of table ware. Spaced above the lower dish supporting rack is an upper dish supporting rack 25 made of wires which are bent to form a plurality of compartments 26 for supporting different sizes and types of dishes and table ware used in the home. As these supporting racks per se form no part of this invention it is not deemed necessary to describe in detail the various compartments formed therein.

In providing a pair of dish supporting racks within the washing compartment of the dish-washing apparatus, it is desirable to efficiently use the available cubicle contents of the washing space so that the maximum number of articles may be washed in a single operation of the apparatus. Moreover, it is desirable that the racks be positioned or supported so that they may be readily moved into and out of the washing space with a minimum amount of noise due to rattling of the dishes and without damage to the dishes either from breaking or chipping.

In accordance with this invention these desirable ends are achieved by providing a single supporting frame 27 for both the lower rack 22 and the upper rack 25. This supporting frame, as shown in Fig. 1, lies between the upper and lower racks and comprises a substantially rectangular shaped open frame having front and back walls 28 and 29 and side walls 30 and 31. Provided along the top edges of each of these walls is an integrally formed overhanging flange 32. Suitably secured to the bottom edges of the walls of the frame 27 are a plurality of arms 33 which project downwardly and inwardly and whose ends are welded to a supporting wire to form a supporting ledge upon which is placed a screen and the lower dish supporting rack 22. Thus the lower basket is suspended from and below the frame 27. Provided within the frame in each corner thereof are a plurality of angle brackets 34 which are welded to the adjacent walls of the frame, as shown in Fig. 2. In each corner of the upper rack 25 there is provided a downwardly projecting generally V-shaped wire 35 which is formed so as to provide a flattened portion 36 which is adapted to rest on the angle bracket 34 and a U-shaped portion 37 which is adapted to project down along the side of the brackets. By means of this construction, the upper basket is removably supported on and above the frame 27 and by providing the U-shaped portion 37 on the wires 35 the upper basket is kept from shifting in the frame during movement of the frame into and out of the vat.

Provided within the vat 10 is improved means for supporting the frame 27 so that the upper and lower dish racks supported thereon can be easily moved in unison out through the opening 11 to a loading or unloading position over the previously opened door 16 and back through the opening 11 to a washing position within the vat 10. In describing the details of construction of this improved supporting structure reference will be had to Figs. 2 through 5 which show enlarged views of the support for one side only of the frame 27, namely the left-hand side. It will be understood that a similar rolling or sliding sup-

port is provided for the right-hand side of the frame 27. However, it is deemed unnecessary to show the construction of the right-hand side support in detail since it is identical in all respects to the support shown except for certain obvious modifications necessary to permit it to be mounted on the right-hand side wall of the vat 10.

Referring to Figs. 2 through 5, it will be observed that the support for each side of the frame 27 comprises a substantially Z-shaped rail member 38. This rail member is secured near its front and rear ends, by means of the bolts 39, to the top surfaces of the L-shaped brackets 40. The openings in the rails for receiving the bolts 39 are made slightly oversize to permit small longitudinal adjustments of the rail relative to its support. The L-shaped brackets are secured to the side walls of the washing vat by means of the pairs of nuts and bolts 41 and suitable gasket means 42 are provided on each side of the side walls so as to prevent leakage at this point and also to form a cushion for the supporting brackets. In order to increase the rigidity of the Z-shaped rail member 38 a pair of reinforcing ribs 43 are provided therein intermediate its ends.

As shown in Fig. 3 the bracket supporting the rear of the rail member 38 is spaced slightly below the bracket supporting the front of the rail member so that the rail has a slight pitch from front to back within the vat. This produces a gravity bias for the frame toward the rear of the vat and facilitates movement of the frame with the loaded dishes thereon into the vat. It also insures that the racks supported on the frame will be properly positioned within the vat for effective washing operations. Moreover, the rail members or trackways 38 are mounted on the side walls of the vat intermediate the top and bottom walls so that the upper and lower dish supporting racks supported on the frame 27 will clear the top and bottom edge of the opening 11. Thus, but a single pair of rails are required for slidably supporting both dish racks within the vat 10.

Formed at the front end of the rail member or trackway 38 is an integrally formed projecting bracket 44 in which is mounted a pin 45. Rotatably journaled on this pin is a free running roller 46 which is adapted to engage, as shown in Fig. 4, the under side of the overhanging flange 32 formed on the top edges of the side walls of the frame 27. This engagement provides a free rolling or sliding support for the front edge of one side of the frame 27 when it is in the position shown in Fig. 2, and also provides a free running support for the intermediate portion of the side of the frame 27 when the frame and the supporting racks thereon are in the withdrawn position.

Provided at the rear corners of the frame 27 on each of the side walls 30 and 31 is a similar roller 47 which is rotatably journaled on a pin 48 supported in the side wall near the top edge thereof, as shown in Figs. 1 and 3. This roller member is adapted to ride on the bottom edge 49 of the Z-shaped rail member 38 so as to rollably support the rear portion of the rack frame 27. By means of these two roller constructions, one of which is mounted on the rail and engages the overhanging flange 32 of the frame and the other of which is mounted on the frame and engages the rail, a free running slidable or rollable support is provided by means of which the frame 27 and the dish supporting racks mounted thereon

may be withdrawn from or moved into the vat 10.

In order to limit the movement of the frame into the vat 10 there is provided on the back end of each rail member 38 an integrally formed bracket 50 in which is provided a cushion 51 in the form of a synthetic rubber bumper which is adapted to engage the roller 47 to form a cushioned stop. To limit the movement of the frame out of the compartment and thus define the loading or unloading position of the racks supported on the frame there is pressed out of the side wall 30 of the frame an ear 52 which when the frame is in the withdrawn position shown in dotted lines in Fig. 3 abuts against the front roller 46 so as to limit further outward movement.

As the frame 27 and the loaded dish racks supported thereon are moved through the side opening of the vat from their innermost position shown in full lines in Fig. 3 to the extended position shown in dotted lines in Fig. 3 the center of gravity of the entire rack construction moves from beyond the inner side of the roller 46 to beyond the outer side of the roller 46. This movement of the center of gravity causes the assembly to pivot about the roller 46 and as soon as the center of gravity is in front of the roller 46 the roller 47 is raised off the trackway 49. In order to limit this pivotal movement of the rack assembly so as to prevent the lower front edge of the lower dish supporting rack 22 from striking the surface of the open door, there is welded along the top edge of the Z-shaped rail member 38 an outwardly projecting flange or cover plate 53 which is adapted to extend over the top surface of the overhanging flange 32 of the frame 27 as shown in Figs. 4 and 5. When the frame 27 pivots about the front roller 46 in a counterclockwise direction this pivotal movement will be limited by the engagement by the rear roller 47 with the under side of plate 53. It will be observed that when the roller 47 and the plate 53 are in engagement the plate in effect serves as an upper trackway for the roller 47 and increases the effectiveness of this roller in producing a free rolling relation between the frame and its trackway especially when the frame is pushed inwardly from its withdrawn position shown in dotted lines in Fig. 3.

As shown in Fig. 2, plate 53 is shorter than the rail 38 and is mounted on the rail so that the front end thereof is not covered. This exposed portion of the rail is provided so as to permit the frame 27 to be removed from the rails. The distance between the front end of the plate 53 and the innermost edge of the roller 46 is made sufficiently great so that when the frame 27 is in its extended position and the stop 52 strikes the roller 46, the roller 47 and the flange 32 of the frame are so positioned with reference to the front end of the plate 53 that the front of the frame can be raised. This permits the stop 52 to ride upward on the roller 46 until the roller 47 is pulled beyond the front end of the plate 53. In this position the frame 27 and the racks supported thereon can be lifted as a unit upward and away from the track 49. In mounting the rack assembly on the rails 38 just the reverse procedure will be employed.

From the foregoing detailed description it is believed that the operation of the improved rack construction of this invention is apparent. It will be observed that there is provided in accordance with this invention an improved construction by which a plurality of racks may be slidably supported on a single track and roller assembly

so that the racks may be moved in unison out of the side opening of a dishwasher cabinet freely and easily and without damage to the articles supported on the racks. It will also be observed that the improved construction of this invention includes means for insuring that the rack construction when in its extended position will not pivot about its support, which means are positioned so as to increase the effectiveness of the rollers for supporting the rack assembly and yet at the same time permit the entire rack assembly to be readily removed from its supporting trackway.

While a particular embodiment of this invention has been shown, it will be understood of course that it is not intended to be limited thereto since many modifications may be made and it is contemplated therefore by the appended claims to cover all such modifications as fall within the true spirit and scope of the invention.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. In a washing apparatus, a vat having a side opening therein through which articles to be washed may be inserted, a rail mounted on each of the opposite side walls of said vat, a frame, roller means for supporting said frame on said rails so that said frame may be rolled into and out of said vat, means for supporting a dish carrying rack from and below said frame, and additional means within said frame for removably supporting a second dish carrying rack above said frame.

2. In a dishwashing apparatus having walls including a pair of oppositely disposed side walls defining a front opening therein, a pair of vertically spaced racks adapted to be moved in unison outwardly through said side opening from a washing position to a loading and unloading position, a frame lying intermediate said vertically spaced racks and adapted to support each of said racks, a rail mounted on each of said oppositely disposed side walls intermediate the top and bottom edges of said side opening, roller means on said frame and said rail adapted to cooperate with said rail and said frame respectively to provide a free rolling support for said frame, and means for limiting pivotal movement of said frame about said roller means on said rail as said frame is moved outwardly to said loading and unloading position.

3. In a dishwashing apparatus having walls including a pair of oppositely disposed side walls defining a front opening therein, a pair of vertically spaced racks, a frame lying intermediate said vertically spaced racks and adapted to support each of said racks, a rail mounted on each of said oppositely disposed side walls intermediate the top and bottom edges of said side opening, roller means on each of said rails adapted to cooperate with said frame to provide a free rolling support for said frame, and means on each of said rails for limiting the pivotal movement of said frame about said roller means as said frame is moved to an extended position out of said opening, said last mentioned means being constructed and arranged so that when said frame and said rack means supported thereby are in said extended positions they may be removed as a unit from said rails.

4. In a dishwashing apparatus, a vat having walls including oppositely disposed side walls defining a front opening therein through which articles to be washed may be moved into and out of said vat, a frame, a lower dish supporting

rack suspended from said frame, an upper dish supporting rack supported on and above said frame, a pair of rails, roller means for supporting said frame on said rails, means for supporting one of said pair of rails on each of said oppositely disposed side walls of said vat intermediate the top and bottom edges of said front opening to permit free movement of said racks in unison through said opening, said rails being pitched to bias said frame and said racks into said vat, means on said rails for limiting the movement of said frame into said vat to define a washing position for said rack, and means on said frame for limiting the movement of said frame out of said vat to define a loading and unloading position for said racks.

5. In a dishwashing apparatus having walls defining a side opening therein, a construction for supporting a pair of dish racks within said washing apparatus comprising a frame having a plurality of walls including a pair of side walls, an overhanging flange along the top edges of said walls, means depending from said walls for supporting a dish supporting rack below said frame, and means within said frame for removably supporting a dish supporting rack above said frame, a pair of rails, a roller supported on each of said side walls of said frame near the back end thereof, a roller supported on each of said rails near the front end thereof, and means for supporting the separate rails of said pair of rails on oppositely disposed walls of said washing apparatus so that the said rollers on said rails track in said overhanging flange portion of said frame and said rollers on said frame track on said rails, said supporting means being positioned in said washing apparatus relative to said side opening so that said frame and said racks may be rolled in unison through the side opening thereof.

6. A rack construction for a chamber having walls including a pair of oppositely disposed side walls defining a front opening therein comprising an upper rack, a lower rack, a frame lying intermediate said upper and lower racks and supporting said racks in vertically spaced relation, a rail adapted to be supported on each of said oppositely disposed side walls of said chamber, roller means mounted on the front of each of said rails so as to engage a portion of said frame, roller means mounted on the rear of said frame so as to engage each of said rails, stop means on said frame adapted to engage said roller means on said rail to limit the withdrawing movement of said frame from said chamber, stop means on said rail and adapted to engage said roller means on said frame to limit the movement of said frame into said chamber, and means secured to said rails so as to overlie said roller means on said frame to limit the pivotal movement of said frame about said roller means on said rails upon the withdrawal of said frame from said chamber, said last mentioned means

forming an upper tracking surface for said roller means on said frame to increase the effectiveness of said roller means.

7. A rack construction for a chamber having walls including a pair of oppositely disposed side walls defining an opening therein, comprising an upper dish supporting rack, a lower dish supporting rack, a frame adapted to lie intermediate said upper and lower dish supporting racks to support said racks in vertically spaced relation, a rail adapted to be supported on each of said oppositely disposed side walls of said vat, roller means mounted on the front of each of said rails and adapted to engage a portion of said frame, roller means mounted on the rear of said frame and adapted to engage each of said rails, stop means on said frame adapted to engage said roller means on said rail to limit the withdrawing movement of said frame, and a flange secured to said rail so as to overlie said roller means on said frame to limit the pivotal movement of said frame about said roller means on said rails upon withdrawal of said frame from said chamber, said flange having its front end spaced from said roller means on said rail so that when said stop is in engagement with said roller means on said rail, said roller means on said frame may be moved from under said flange to permit said frame to be removed from said rails.

8. In a dishwashing apparatus, a vat having walls defining a side opening therein through which articles to be washed may be moved into and out of said vat, a door for closing said opening, means for hingedly mounting said door so that it is movable from a substantially vertical closed position to a substantially horizontal open position, a frame, a lower dish supporting rack suspended from said frame, an upper dish supporting rack supported on and above said frame, a pair of rails, means for slidably supporting said frame on said rails, means for supporting said rails on opposite side walls of said vat intermediate the top and bottom edge of said front opening to permit free movement of said frame with said dish supporting racks supported thereon into and out of said vat when said door is in its open position, said rails being pitched to bias said frame into said vat, means on said rail for limiting the movement of said frame into said vat to define a washing position for said racks in said vat, means on said rails for limiting the movement of said frame out of said vat to define a loading and unloading position for said racks over said door when said door is in its horizontal open position, and flange means on said rails for limiting pivotal movement of said frame relative to said rails as said racks are moved between said two positions so as to prevent said lower rack from striking the surface of said door when said door is in its open position.

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