

May 15, 1956

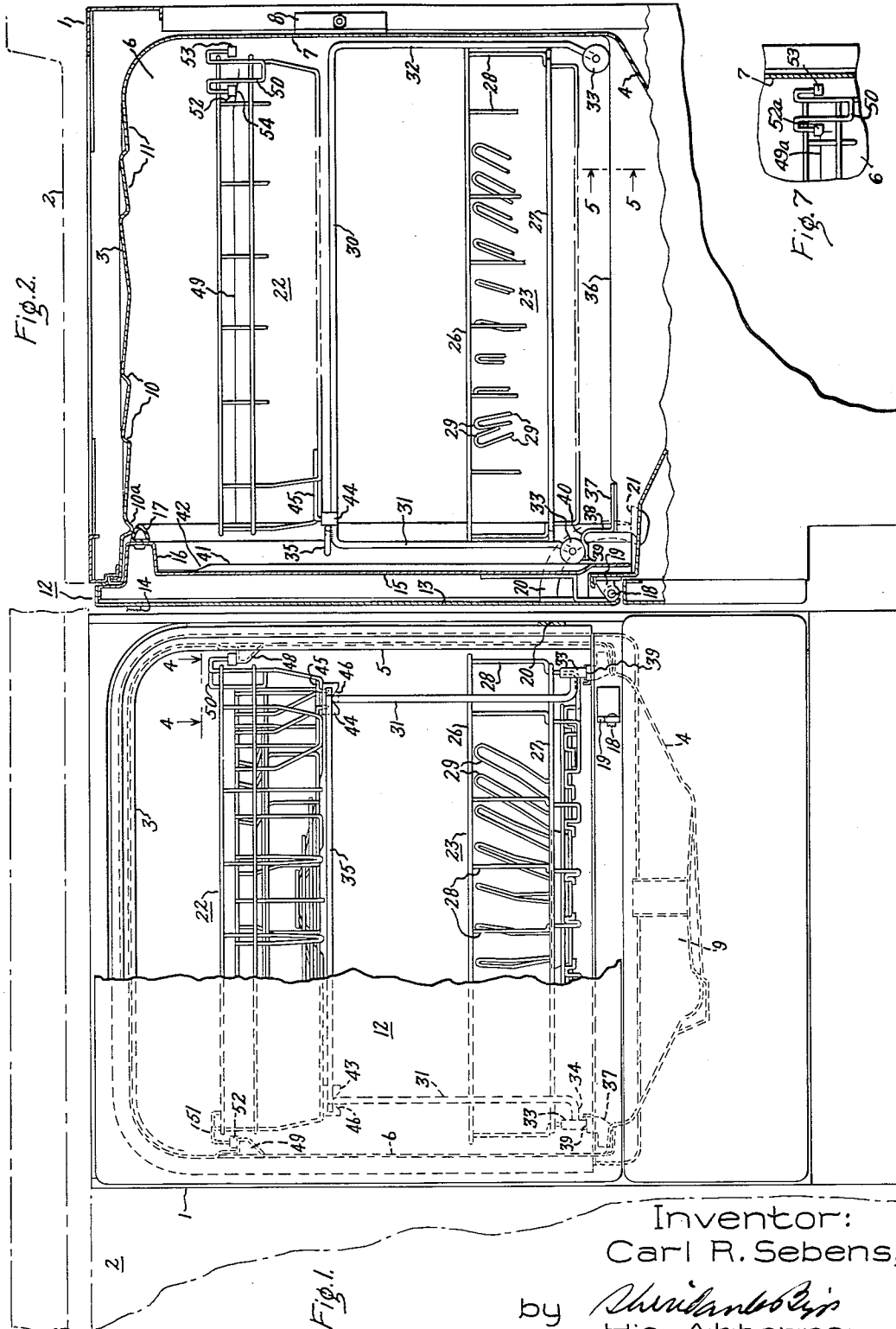
C. R. SEBENS

2,745,707

DISHWASHER RACK AND SUPPORTING FRAME

Filed Oct. 30, 1952

2 Sheets-Sheet 1



Inventor:
Carl R. Sebens,
by *Charles A. B. B. B.*
His Attorney.

May 15, 1956

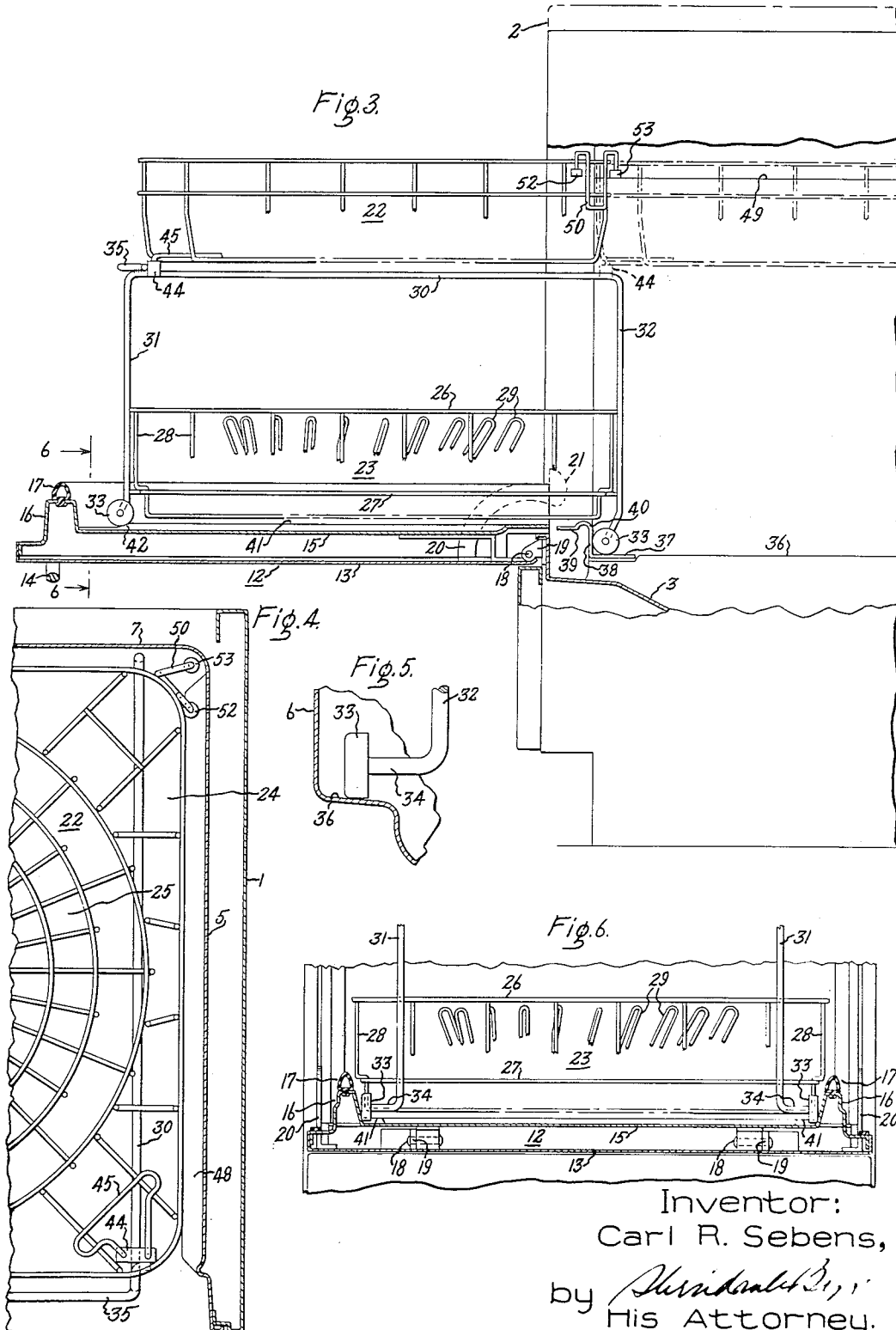
C. R. SEBENS

2,745,707

DISHWASHER RACK AND SUPPORTING FRAME

Filed Oct. 30, 1952

2 Sheets-Sheet 2



1

2,745,707

DISHWASHER RACK AND SUPPORTING FRAME

Carl R. Sebens, Bridgeport, Conn., assignor to General Electric Company, a corporation of New York

Application October 30, 1952, Serial No. 317,798

3 Claims. (Cl. 312—311)

This invention relates to dishwashing machines, and more particularly to a dish rack and supporting frame structure, which is slidably mounted for movement into and out of the machine.

An object of my invention is to provide a dish rack construction for a dishwashing machine which facilitates loading and removal of the dishes, silverware and utensils placed therein.

A further object of my invention, in connection with a dishwasher, is to arrange supporting racks for dishes so that there is complete access to all parts thereof without removal of any section of the rack from the machine.

Still further objects of my invention include the provision of an economically constructed rack assembly for such machines, which effectively utilizes all available space within the washing compartment, with sections of the rack being capable of being withdrawn from the machine individually.

In accordance with an exemplary embodiment of this invention, as applied to a front opening dishwasher having an access door hinged at its lower edge, a lower dish rack is integral with roller mounted supporting frame members, so that both the frame and lower rack may be rolled into or out of the machine. These frame members also include top rails extending into the machine along the side walls thereof for slidable support of the front portion only of an upper dish rack. The rear portion of this upper rack is slidably supported on tracks formed internally on the side walls of the washing tub. With this arrangement, the lower rack and supporting frame can be pulled out for loading, while the upper rack remains within the machine; and subsequently the upper rack can be moved out for loading. A stop arranged between the upper rack and the supporting rails prevents the upper rack from extending out of the machine beyond its supported position. Hence, whenever the lower rack is pushed back into the tub or cabinet, the upper rack likewise is automatically returned to a position within the cabinet.

My invention will be better understood from the following description taken in connection with the accompanying drawings, and its scope will be pointed out with particularity in the appended claims.

Referring to the drawings, Fig. 1 illustrates a dishwasher embodying my invention in front elevation, with a portion thereof broken away to illustrate interior construction; Fig. 2 is a side elevation, partly in section; Fig. 3 is a side elevation, partially in section, similar to Fig. 2, but with the dish racks shown in their extended positions; Fig. 4 is a cross-sectional view taken on the line 4—4 of Fig. 1, in the direction of the arrows; Fig. 5 is a cross-sectional view taken on the line 5—5 of Fig. 2; Fig. 6 is a cross sectional view taken on the line 6—6 of Fig. 3; and Fig. 7 is a fragmentary view, partly in section of a modified form of my invention incorporated in a dishwasher generally similar to the one shown in Fig. 2.

Referring now to the drawings, particularly Figs. 1

2

and 2, I have shown my invention as embodied in a front opening dishwasher having an outer casing 1 of generally rectangular configuration, which may carry or be a part of a suitable counter or sink 2, as shown in phantom lines. This casing encloses a washing tub having top and bottom walls 3 and 4 respectively, side walls 5 and 6, and a rear wall 7. This tub may be secured within casing 1 in any suitable manner and in the present illustration, Fig. 2, I have shown only one such point of support through bracket means 8 at the rear of the machine. It is to be understood, of course, that additional points of support are provided as necessary to rigidly support the tub and its contents within the enclosing casing. The bottom 4 of the tub extends downwardly to form a well 9 into which a quantity of water or washing solution may be placed, from whence it may be thrown violently upwardly over the dishes by any suitable means (not shown). Additionally, top wall 3 is formed with a plurality of circular corrugations 10 and sloping interconnecting faces between corrugations such as 11, whereby the upwardly impelled water upon striking the top wall will be reflected in diverse directions to further aid in thorough cleansing of articles placed within the machine.

A front wall, completing the tub enclosure, is provided by means of a door indicated generally at 12 (Fig. 1). As herein shown by Figs. 2 and 3, this door consists of an outer panel 13 upon which may be secured a handle 14 adjacent its upper edge, and an inner door panel 15 secured to the outer panel by any suitable means, such as by welding along contiguous edges. An inwardly extending rim 16 of the inner door panel presents exterior surfaces closely approaching corresponding surfaces of the sides, top, and bottom of the tub at the front portions thereof. As an additional precaution, to prevent water from leaking or being thrown out of the machine past the door, I employ a flexible sealing gasket 17 adapted to make contact with internally projecting beads 10a formed in the top and side tub walls (see Fig. 2). To provide access to the tub, door 12 is hinged at its lower edge on hinge pins 18 carried by brackets 19, which in turn are secured to the bottom wall of the tub. To limit the pivotal movement of the front door in its opening direction, I employ one or more arcuate stop arms 20 secured to the door, which are movable within slots formed within either the casing or the tub, and having a projection 21 thereon limiting the pivotal movement to substantially 90°. Thus, when the door is pivoted to its open position, as shown in Fig. 3, its upper surface 15 is substantially horizontal.

To support dishes, utensils, or other articles within the machine, I employ upper and lower dish-rack assemblies 22 and 23 respectively. As herein illustrated, the upper rack is formed from lengths of relatively rigid wire, preferably of stainless steel, which are welded together at each point of intersection. While a number of different configurations of these supporting wires may be made, I prefer to form the upper rack with an outer portion 24 (Fig. 4) for receiving small plates, saucers, bowls, and other similar articles, whereby they are retained in a more or less vertical position; and an inner circular supporting area 25 for glasses, cups and the like. Lower rack 23, likewise fabricated from suitable lengths of stainless steel wire, comprises, for example, a top frame member 26 and a lower frame member 27, with suitable vertical spacing members 28 as shown clearly in Figs. 1 and 2. Thus, a substantially rectangular frame is provided for a plurality of upwardly and angularly arranged supporting fingers 29 appropriately shaped and spaced to receive dinner plates and other large articles. Obviously either rack may be provided with an appropriate perforated cup (not shown) to receive silverware and other small articles.

To support racks 22 and 23 in desired positions within the tub, I employ frame members integral with the lower rack, here shown as of an inverted U-shape, having a top rail 30 and downwardly extending front and rear legs 31 and 32. Preferably each of these frame members is arranged adjacent to sidewalls 5 and 6 respectively and in a plane parallel thereto. The lower terminus of each of the legs is provided with movable supporting means, such as rollers 33. To secure a roller to its associated leg, each leg may be provided with a right angle bend at its terminus to provide an axle portion 34, as clearly illustrated by Fig. 5. While rollers are shown herein for the mounting, obviously other types of slidable or anti-friction members may be employed for mounting the lower rack structure within the machine. Lower rack assembly 23 is suitably secured to and made integral with these vertically extending legs, for example, by spot welding to the frame members 26 and 27. The support frame may be given additional rigidity, if desired, by use of a transverse rod member 35 as shown in Fig. 1.

To receive each of the rear rollers 33, I prefer to form tracks 36 at the junctures between sidewalls 5 and 6 and the bottom wall 4. By forming tracks 36 in a substantially horizontal plane, the rear portions of the supporting frame and the lower rack are mounted for movement into and out of the washing tub. At the forward portion of these tracks adjacent the front door, I secure angle brackets 37, each having a vertically extending portion 38, which form stops for rear rollers 33, thus preventing the frame and lower rack from accidentally rolling completely out of the machine. Brackets 37 may additionally provide a point of support, by means of a horizontal surface 39, for front rollers 33 of the supporting frame. A slight hump 40 formed in each bracket 37, between its horizontal portion 39 and its vertical portion 38, is added to limit inward movement of the rack and supporting frame assemblies, thereby to protect the contents of the racks from a sudden contact with the rear wall of the tub upon movement into the tub.

Referring now to Fig. 3, which illustrates the door in its fully open position, suitable track means 41 for front rollers 33 are arranged on the top surface 15 of the door. These tracks 41 desirably are in the same horizontal plane with the horizontal portion 39 of bracket 37, so that the entire supporting frame is presented a smooth path for rolling movement. At the outer end of each track 41 on the front door, a slight downward incline 42 is formed to retain the rack and frame assembly in its fully extended or withdrawn position.

To facilitate loading and unloading of the machine, I have arranged upper rack assembly 22 for movement independently of the lower rack when the lower rack is in its extended position. As clearly shown in Figs. 1-3, the front portion of the upper rack has secured thereto slide blocks 43 and 44 by means of wire frame members 45 welded to the upper rack at each of its forward corners. Each of the slide blocks, formed of a material which slides with a minimum of friction, has a V-shaped groove 46 adapted to ride on the corresponding top rail 30 of the lower rack frame. As shown in Figs. 2 and 3, transverse rod 35, welded to the front end of each of the top rails functions as a stop to limit forward motion of the slide blocks and thereby prevent accidental withdrawal of the top rack beyond its supported position on the top rails. Rod 35 may also serve as a convenient handle for manipulating the racks.

To support the rear of upper rack 22, horizontal tracks 48 and 49 are formed along the upper portions of side walls 5 and 6 respectively. Obviously, these tracks may be pressed directly out of the material forming the sidewalls or may be in the form of separate brackets affixed to the sidewalls. The upper rack includes a pair of supporting brackets 50 and 51, with the outer end of

each bracket carrying a pair of slider blocks or rollers 52 and 53 as clearly shown in Fig. 2. These rollers are herein shown as mounted on a vertical axis, thereby presenting sliding surfaces for tracks 48 and 49 and rolling surfaces against the vertical sidewalls. I prefer this arrangement for stability of the upper rack and also for the purpose of introducing a limited amount of friction tending to prevent outward movement of the upper rack as the lower rack is withdrawn. Predictable operation can be further assured by construction of tracks 48 and 49, cooperating with the rear supporting members of the top rack, whereby initial outward movement of the top rack from the tub causes a slight vertical movement of the rack. For example, the end of the tracks adjacent rearwall 7 may be formed with a slight downward slope, as shown at 54 in Fig. 2; the same result obviously could be accomplished by employing blocks, each having a sloping bearing face riding on a flat track. The latter construction is illustrated in Fig. 7, in which slidable support member 52a has a downwardly sloped face toward the rear of the tub and engages the rear end or corner of track 49a which corresponds to track 49 previously discussed above. The engagement between the tracks and slidable support members is such that a resistive force is exerted on the sliding members when the rack assembly is moved forwardly and is such that the initial outward movement of the upper rack is thereby restrained.

During the washing operation or when the machine is at rest, both of the dish racks 22 and 23, along with the supporting frame, are retained within the machine in the position shown by Figs. 1 and 2. In this position it may be seen that both racks are adequately supported, since the lower rack, which is integral with the supporting frame, is carried by four rollers 33 on the legs of the supporting frame. The upper rack, in turn, is supported at its front on slide blocks 43 and 44, which in turn rest upon top rails 30 of the frame. Upper rack 22 is additionally supported at its rear by its pair of brackets 50 and 51, each carrying the sliding members 52 and 53, resting upon respective sidewall tracks 48 and 49. When it is desired to gain access to the dish racks, either for removal of the contents or for loading, the front door is opened, pivoting about the hinge at its lower edge to a substantially horizontal position. As explained above, the door is retained in this position by arcuate stop arms. At this time the combined supporting frame and lower rack may be pulled out of the machine with relative ease in view of its roller mounting. The upper rack will remain within the tub, since the rear portion of this rack must rise up a slight incline upon its initial outward movement; and whereas the limited friction of slide blocks 43, 44 on top rails 30 provides insufficient force to commence outward movement of the top rack. Hence the lower rack is fully exposed for ready access. At any time, while the lower rack remains withdrawn, or in its extended position, the upper rack may be pulled forward to its exposed position. Obviously, either rack may be completely removed at any time, although normally this will be entirely unnecessary since either rack may be placed in an exposed position for complete access thereto. The stop 35 secured to the top rails prevents any outward movement of the upper rack beyond the top rails, and also serves the useful function of returning both racks into the machine whenever the supporting frame is returned into the machine.

While the present invention has been described by reference to a particular embodiment thereof it will be understood that numerous modifications may be made by those skilled in the art without actually departing from the invention. I, therefore, aim in the appended claims to cover all such equivalent variations as come within the true spirit and scope of the foregoing disclosures.

5

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

1. In a dishwasher having an enclosing tub of substantially rectangular configuration with a front opening door therefor hinged with respect to said tub along the lower edge thereof, a rack assembly for supporting dishes within said tub comprising a pair of inverted U-shaped supporting frame members each including a substantially horizontal top rail, rollers on the lower terminals of said frame members, means in said tub and on said door when in its open position defining tracks parallel with the side walls of said tub for said rollers, a lower dish rack rigidly secured to said frame members, an upper dish rack, supporting blocks secured to said upper rack at the front thereof and positioned for slidable movement on said frame top rails, upper support rollers secured to said upper rack at the rear thereof, an upper track formed on the side walls of said tub for receiving said upper supporting rollers thereby providing support for the rear portion of said upper rack, the rear end of said track terminating in a downwardly sloped portion on which said upper supporting rollers rest when said upper rack is within said tub, and stop means preventing outward movement of said supporting blocks beyond the forward end of said top rails.

2. In combination, a dishwasher having an enclosed tub of substantially rectangular configuration with a front opening access door hinged at its lower edge, upper and lower dish racks movable into and out of said tub, and support means for said racks comprising a pair of supporting frame members each having a top rail in a substantially horizontal plane and downwardly extending front and rear legs, a roller at the terminus of each of said supporting frame legs, means within said tub and on said door when in its open position defining tracks for said rollers, said lower rack being rigidly secured to said frame members, sidewall tracks formed in the

6

sidewalls of said tub adjacent said upper rack, means slidably supporting the rear portion of said upper rack on said sidewall tracks, the rear end of said tracks terminating in a downwardly sloped portion on which said last mentioned means are supported when said upper rack is within said tub, and means supporting the front portion of said upper rack on said top rails.

3. In a dishwasher having an enclosed tub of substantially rectangular configuration with a front opening door therefor hinged with respect to said tub along the lower edge thereof, a rack assembly movable into and out of said tub for supporting dishes comprising a lower rack having top supporting rails adjacent to said side walls, means mounting said lower rack for movement into and out of said cabinet, an upper rack having its lower front portion slidably mounted on said rails of said lower rack, upper track members on the side walls of said tub, said upper rack having support members at its rear slidably upon said track members and engageable with the rear end of said track members when said upper rack is within said tub, at least one of said members having an inclined surface downwardly sloped toward the rear of said tub and contacting the one of said members engageable therewith when said upper rack is within said tub so as to exert resistive force when said rack assembly is moved forwardly, whereby the initial outward movement of the upper rack is resisted by engagement of said members, so as to allow the lower rack to be moved out of said tub independently of said upper rack.

References Cited in the file of this patent

UNITED STATES PATENTS

851,711	Tory	Apr. 30, 1907
1,761,303	Hunter	June 3, 1930
2,620,811	Walker	Dec. 9, 1952