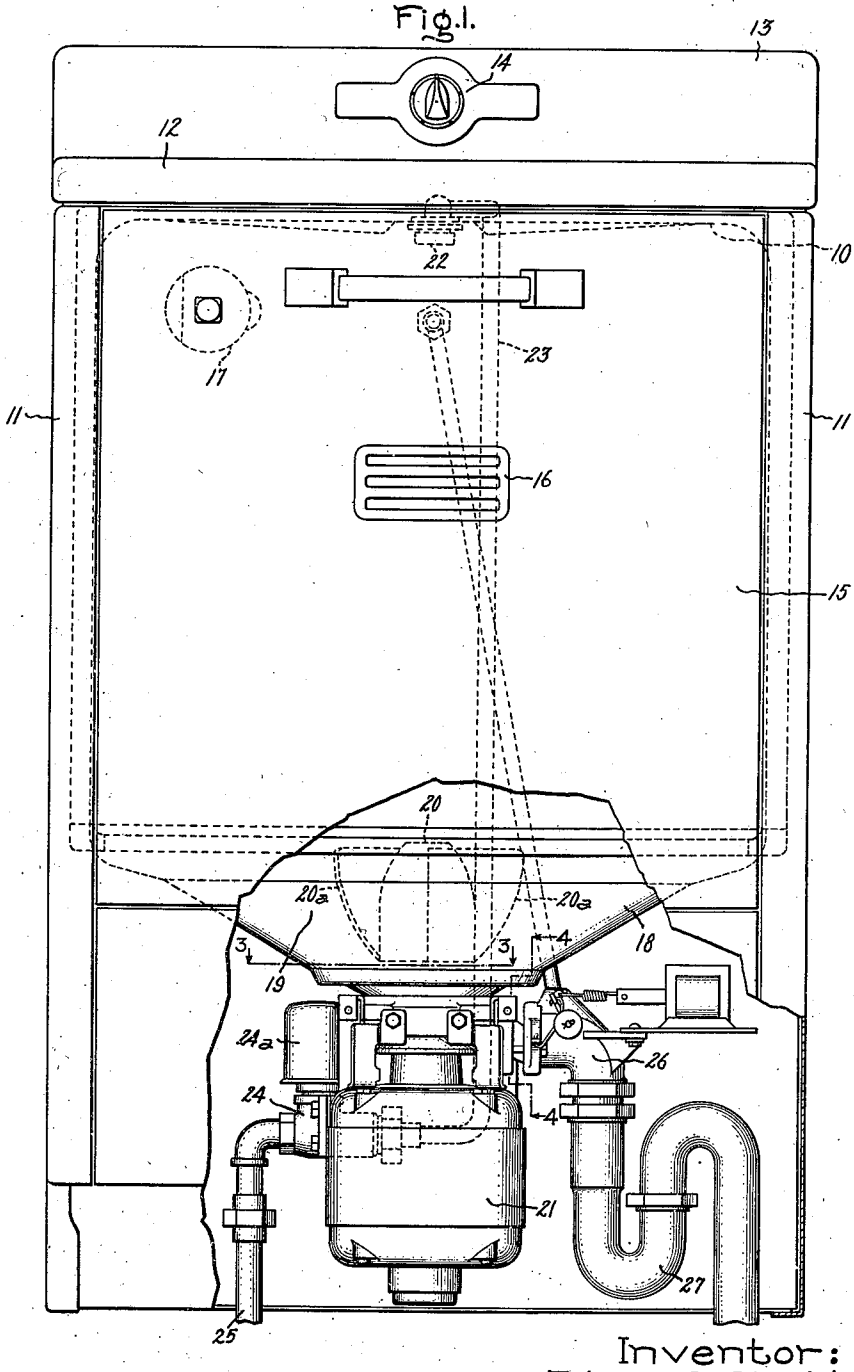
May 26, 1942. E. S. STODDARD 2,284,456

WASHING APPARATUS

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Fig. 1.



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Fig.2.

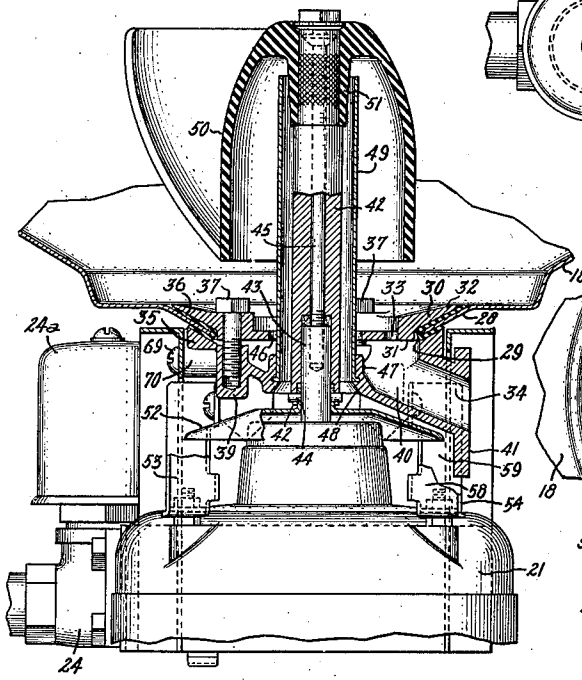


Fig.3.

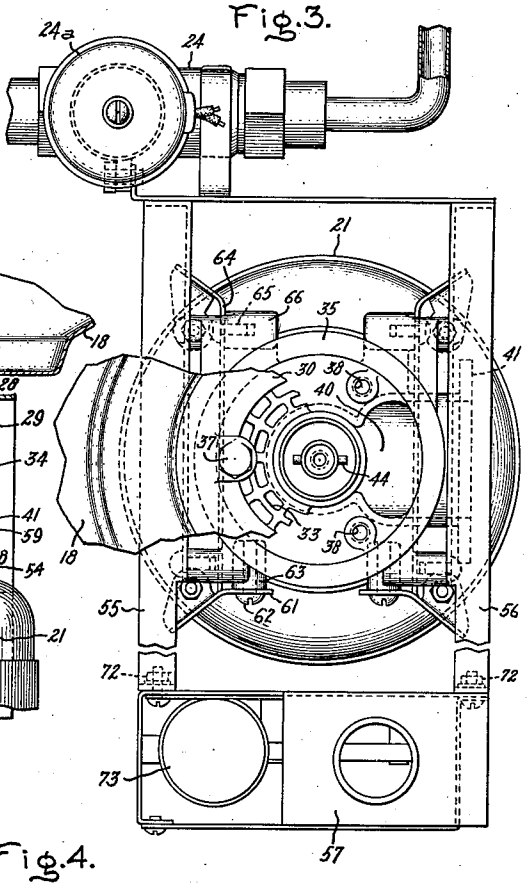
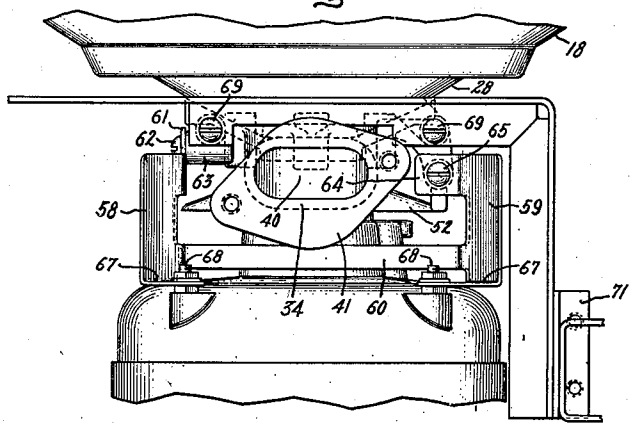


Fig.4.



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UNITED STATES PATENT OFFICE

2,284,456

WASHING APPARATUS

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Application February 27, 1941, Serial No. 380,849

2 Claims. (Cl. 141—9)

This invention relates to washing apparatus and has for its object the provision of improved apparatus of this character which is simpler in construction and less expensive to manufacture.

While not limited thereto, this invention has particular application to dishwashing apparatus wherein a washing fluid such as water is circulated or hurled through a washing vat by suitable power driven means such as a motor driven impeller so as to effect a cleansing action on the dishes supported within the vat.

It is a specific object of this invention to provide a new and improved, low cost drain assembly for the washing vat of such a washing apparatus.

It is a further object of this invention to provide improved and inexpensive means for supporting the operative elements of such a washing apparatus.

It is a still more specific object of this invention to provide improved means for supporting the operative elements of the washing apparatus from the drain assembly for the washing apparatus so that the number of supporting openings in the washing vat is reduced to a minimum, thereby reducing the sealing problem attendant the provision of such openings in the washing vat.

It is a still more specific object of this invention to provide improved and inexpensive means for supporting the operative elements of the washing apparatus as a unitary assembly which can be separately tested and which can be mounted on the washing vat in such a manner that each element may be quickly and easily serviced or repaired.

Further and more specific objects of this invention will become apparent as the following description proceeds and the features of novelty which characterize this invention will be set forth in the claims appended to and forming a part of this specification.

For a more complete understanding of this invention reference should be had to the accompanying drawings in which Fig. 1 is a front elevation of a dishwashing apparatus embodying this invention, a portion of the casing of the apparatus being broken away to illustrate certain details of the improved construction; Fig. 2 is an enlarged view of the operating mechanism shown in Fig. 1, parts being shown in section in order to further illustrate details of the improved construction of this invention; Fig. 3 is an enlarged view taken on the line 3—3 of Fig. 1, parts being broken away to show additional details of this invention; and Fig. 4 is an enlarged view taken on the line 4—4 of Fig. 1 showing still further details of this invention, the front control panel having been omitted from this view.

Referring to the drawings, this invention has been shown as applied to a dishwashing apparatus of the front opening type which comprises a vat 10 supported in a suitable casing having side walls 11 and a top wall 12 which is provided with an integrally formed back splasher plate 13 in which is mounted suitable manually operable control means 14 for controlling the various electrically operated elements of the dishwashing apparatus. Arranged to close the front opening of the washing vat 10 is a door 15 in which is provided a ventilating louver 16 and in which is also provided suitable detergent supplying means 17.

As shown in Fig. 1, the bottom wall 18 of the washing vat 10 slopes downwardly so as to define a receptacle 19 for receiving a washing fluid. Provided within the receptacle 19 defined by the wall 18 is an impeller 20 having blades 20a. The impeller 20 is driven by a suitable motor 21 which is positioned outside of and below the bottom wall 18, as shown in Fig. 1. When driven by the motor 21, the impeller picks up the washing fluid in the receptacle 19 and throws or hurls the fluid up through the washing vat into contact with the dishes contained therein. It will be understood that suitable rack means (not shown) will be used for supporting the dishes within the vat.

Washing fluid, which is preferably warm water, is supplied to the vat 10 by means of a suitable spray device 22 which is supported in the central portion of the top wall of the vat, as shown in Fig. 1. This spray device is connected by means of a suitable pipe 23 which extends downwardly along the outside of the vat between the vat and the rear wall of the casing to the outlet side of a control valve 24, the inlet side of which is connected by means of piping 25 to a suitable source of supply of washing fluid. The valve 24 controls the quantity of washing fluid supplied to the vat 10 and in the preferred form of this invention the valve 24 will be electromagnetically operated by means of a suitable solenoid 24a. It will be observed that the valve 24 is positioned adjacent the motor 21 below the bottom wall 18 in the vat. Also positioned near the motor 21 and below the bottom wall of the vat is a drain valve 26 which is connected to a suitable trap 27 which in turn is connected to a drain system (not shown). Like the fluid inlet valve 24, the drain valve 26 is preferably of the electromagnetically operated type and in the preferred form of this invention is of the type more

particularly described and claimed in my copending application Serial No. 380,853, filed February 27, 1941, and assigned to the assignee of the present invention.

As previously stated, this invention relates to the provision of an improved drain construction for a washing apparatus of the type described above and to improved means for supporting the various operative elements of the washing apparatus, such as the motor driven impeller means, the inlet valve means, and the drain valve means, so that the possibility of leakage from the vat 10 is minimized.

In Figs. 2 through 4 there is illustrated a preferred form of this invention. Referring to these figures, it will be observed that the bottom wall 18 of the vat 10 terminates in a depression 28 which defines a large central opening 29 positioned to lie at the bottom or lowermost portion of the bottom wall 18 of the vat. Arranged to cover the opening 29 from the inside of the vat is a drain plate 30 having a portion 31 which extends into the opening 29 and a flange portion 32 which is adapted to engage the inside surface of the portion of bottom wall 18 defining the depression 28. This drain plate, as shown in Fig. 3, is provided with a plurality of drain openings 33 which are of such a size that they do not interfere with the free flow of fluid therethrough but do prevent any large waste particles from going into the drain system.

Provided below the bottom wall of the vat is a drain casting 34 having an upper flange 35 which engages the outside surface of the portion of the bottom wall 18 defining the recess 28 so as to completely cover the opening 29 provided in the vat. In order to provide a fluid-tight connection between the drain plate 30 and the inside of the bottom wall 18 and between the drain casting 34 and the outside of the bottom wall 18, a U-shaped gasket 36 is mounted over the edge of the bottom wall adjacent the opening 29. In accordance with this invention, the drain casting 34 is supported from the drain plate 30 which in turn is supported on the inside of the bottom wall 18. To effect this support a plurality of bolts 37 are provided which extend downwardly through suitable openings 38 provided in the drain plate and are threadedly received in internally threaded bosses 39 provided in the drain casting 34. It is to be observed that the bolts 37 are so positioned that they extend downwardly through the opening 29 provided in the bottom wall 18, thereby eliminating the need for additional holes in the bottom wall in order to mount the drain assembly on the vat.

In assembling the parts particularly described above, the gasket 36 will first be mounted over the adjacent edge of the bottom wall 18. Then the drain plate will be positioned within the vat 10 and the drain casting will be held in its position outside of the vat 10. The bolts 37 will be then threaded into the drain casting and the parts securely drawn together so that the gasket and sloping portion of the bottom wall 18 will be clamped between the drain plate and the drain casting, thereby to secure a simple, fluid-tight connection of the drain assembly to the washing vat.

Referring further to Figs. 2 through 4, it will be observed that the side and bottom walls of the drain casting 34 define a drain passageway 40 which slopes downwardly to the right, as shown in Fig. 2, and terminates in a flange portion 41 to which is adapted to be secured the drain valve means 26 shown in Fig. 1. In operation, with the drain valve 26 open, fluid previously accumulated in the vat 10 will flow downwardly through the openings 33 in the drain plate 30 and into the passageway 40 of the drain casting and thence through the drain valve 26 and into the trap 27, shown in Fig. 1. It will be observed that by means of this construction the drain valve assembly is secured at a point remote from the washing vat, thus making it possible to easily and quickly replace and repair the drain valve in the event that it becomes clogged or damaged in any way during use.

As previously pointed out, the impeller 20 is adapted to lie within the receptacle 19 formed by the bottom wall 18 of the vat 10 and this impeller is adapted to be driven by the motor means 21 which is supported outside and below the vat. In order to provide a driving connection between the impeller 20 and the motor 21 there is provided a sleeve 42 the upper end of which is secured in the impeller 20 and the lower end of which is fitted over the shaft 43 of the motor. The lower end of the sleeve 42 is provided with a pair of slots which are adapted to fit over a pin 44 projecting through the shaft 43 to provide a driving connection between the shaft 43 and the sleeve 42. Extending downwardly through the sleeve and into the end of the shaft 43 is a bolt 45 which secures the impeller, sleeve, and shaft in their proper driving relation. As shown in Figs. 2 and 3, the sleeve 42 extends upwardly through the drain casting and the drain plate. To permit this, the drain plate is provided with a central opening 46 and the drain casting is provided with a central flange portion 47 defining an opening 48.

To prevent leakage at the point where the sleeve 42 is brought out through the drain casting, the sleeve is positioned within a tubular member 49, the lower end of which is secured in the flange 47 and the upper end of which terminates above the normal level of washing fluid in the receptacle 19 formed by the bottom wall 18 of the vat. It will be observed that the upper end of the tubular member 49 projects into the hub portion 50 of the impeller 20 and is spaced a short distance from the portion 51 of the hub so as to provide a free running relation between the impeller and the stationary tubular member 49. Since the upper end of the tubular member lies above the normal fluid level within the vat, no leakage will occur through the member 49. However, in the event that a small quantity of fluid should drip through the opening provided between the tubular member and the portion 51 of the hub, a deflecting plate 52 is provided on the shaft 43 so as to deflect such fluid outwardly away from the motor 21. It will be understood, however, that such leakage as has just been described only occurs under abnormal operating conditions and the amount of such leakage is extremely small due to the small clearance provided between the upper end of the tubular member 49 and the portion 51 of the hub.

In accordance with this invention all of the operative devices of the washing apparatus including the impeller 20 which is supported on the motor 21 are supported from the drain plate-drain casting assembly just described. In achieving this end, the drain casting 34 is provided with a plurality of bosses to which are secured right and left-hand brackets 53 and 54 respectively for supporting the motor 21 and additional brackets

55 and 56 for supporting the water inlet valve 24 and a control panel 57.

Referring to Fig. 4, it will be observed that each of the motor supporting brackets comprises a front and rear portion 58 and 59 respectively which are interconnected by a horizontal rib portion 60. Projecting laterally from the upper end of the front portion 58 is an ear 61 which is adapted to be secured by means of a screw 62 to a boss 63 integrally formed in the drain casting 34. The rear portion on the other hand is provided at its upper end with a longitudinally extending ear 64 which is secured by means of a screw 65 to a boss 66 integrally formed in the drain casting. Both the front and rear portions 58 and 59 of the motor supporting brackets are provided with horizontally extending foot portions 67 which are adapted to receive bolts 68 for securing the motor casing to the motor supporting bracket. Referring to Fig. 3, it will be observed that four such bolts are provided for securely holding the motor 21 and the impeller 20 supported thereon in their operative positions.

The brackets 55 and 56 on the other hand consist of a pair of L-shaped members which extend transversely across the bottom of the washing vat and as shown in Fig. 4 are secured to the drain casting by means of a pair of screws 69 which are threaded into spaced bosses 70 provided on the right and left-hand side of the drain casting. As shown in Figs. 2 and 4, the rear portion of the brackets 55 and 56 is bent downwardly, and welded or otherwise secured to the bottom portion thereof is a bracket 71 upon which is mounted the water inlet valve 24. Extending across the front of the brackets 55 and 56 and secured thereto by means of bolts 72 is the control panel 57 which includes a water measuring relay coil 73 and a plurality of terminal plates (not shown) with which electrical connections to the various electrically operated devices of the washing apparatus are made. It will be observed that with this latter supporting bracket arrangement it is possible to arrange the control panel in front of the motor 21 so that it will be readily accessible from the front of the washing apparatus for making electrical connections. It will also be observed that with the drain valve supported directly on the drain casting and the inlet valve supported to the rear of the drain casting, but to one side thereof, as shown in Fig. 2, either or both of these valve constructions are readily accessible for replacement or repair from the front of the washing apparatus.

From the foregoing detailed description it will be observed that I have provided a new and improved drain and supporting construction for a washing apparatus which is relatively simple to assemble and by which the component operative elements of the washing apparatus are supported as a compact unit from the bottom of the washing vat by relatively simple and fluid-tight means. Moreover, it will be observed that there is provided in accordance with this invention an improved drain and supporting construction for a washing vat which requires only that a single drain opening be provided in the bottom of the vat in order to support all the operative elements in an exposed and easily accessible position.

While only one modification of this invention has been described it will be apparent that other modifications may be made and I therefore intend to cover in the appended claims all such modifications as fall within the true spirit and scope of this invention.

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

1. A washing apparatus comprising a vat having a bottom wall and an opening in said bottom wall, a drain plate positioned within said vat having a central portion projecting into said opening and a peripheral portion engaging the portion of said bottom wall adjacent said opening, a drain casting positioned outside of said vat and having a flange adapted to engage the outside surface of said bottom wall to cover said opening therein, gasket means positioned over the edge of said bottom wall adjacent said opening and adapted to lie between said drain plate and the inside surface of said wall and said drain casting and the outside surface of said wall, means for securing said drain casting to said drain plate comprising bolts extending downwardly through said opening, said means upon being tightened causing said gasket means to be compressed to form a fluid-tight seal between the bottom wall of said vat, said drain casting and said drain plate, means defining a drain passageway in said drain casting, a flange projecting upwardly into said drain passageway defining an opening in said drain casting, and a tubular member secured in said flange and extending upwardly through said drain passageway and said drain plate to a point substantially above the normal level of fluid in said vat, said tubular means being adapted to receive a shaft for effecting a driving connection between an internally positioned fluid impeller and an externally positioned motor driving unit, said tubular member serving to prevent leakage of washing fluid from said vat through said opening in said drain casting.

2. A washing apparatus comprising a vat having a downwardly sloping bottom wall defining a fluid chamber, a drain opening in the lowermost portion of said bottom wall, fluid circulating means in said fluid chamber defined by said sloping wall, motor means positioned below said bottom wall, a shaft extending through said opening in said bottom wall for connecting said fluid circulating means to said motor means, a perforated drain plate bearing against the inside surface of said bottom wall so as to cover said opening, a drain casting having a portion thereof bearing against the outside surface of said bottom wall so as to cover said opening from the outside, said drain casting having a drain passageway formed therein for the reception of fluids flowing from said vat downwardly through said drain opening, means extending through said opening for securing said drain plate to said drain casting and for clamping the resulting assembly to the portion of said bottom wall adjacent said opening, bracket means on said drain casting for supporting said motor means, a flange projecting upwardly into said drain passageway defining an opening in said drain casting and a tubular member secured in said flange and extending upwardly through said drain plate and into said vat for receiving said shaft to provide a substantially fluid-tight seal along said shaft.

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