

April 13, 1948.

E. M. WILSON

2,439,535

FILTER

Filed Sept. 16, 1944

2 Sheets-Sheet 1

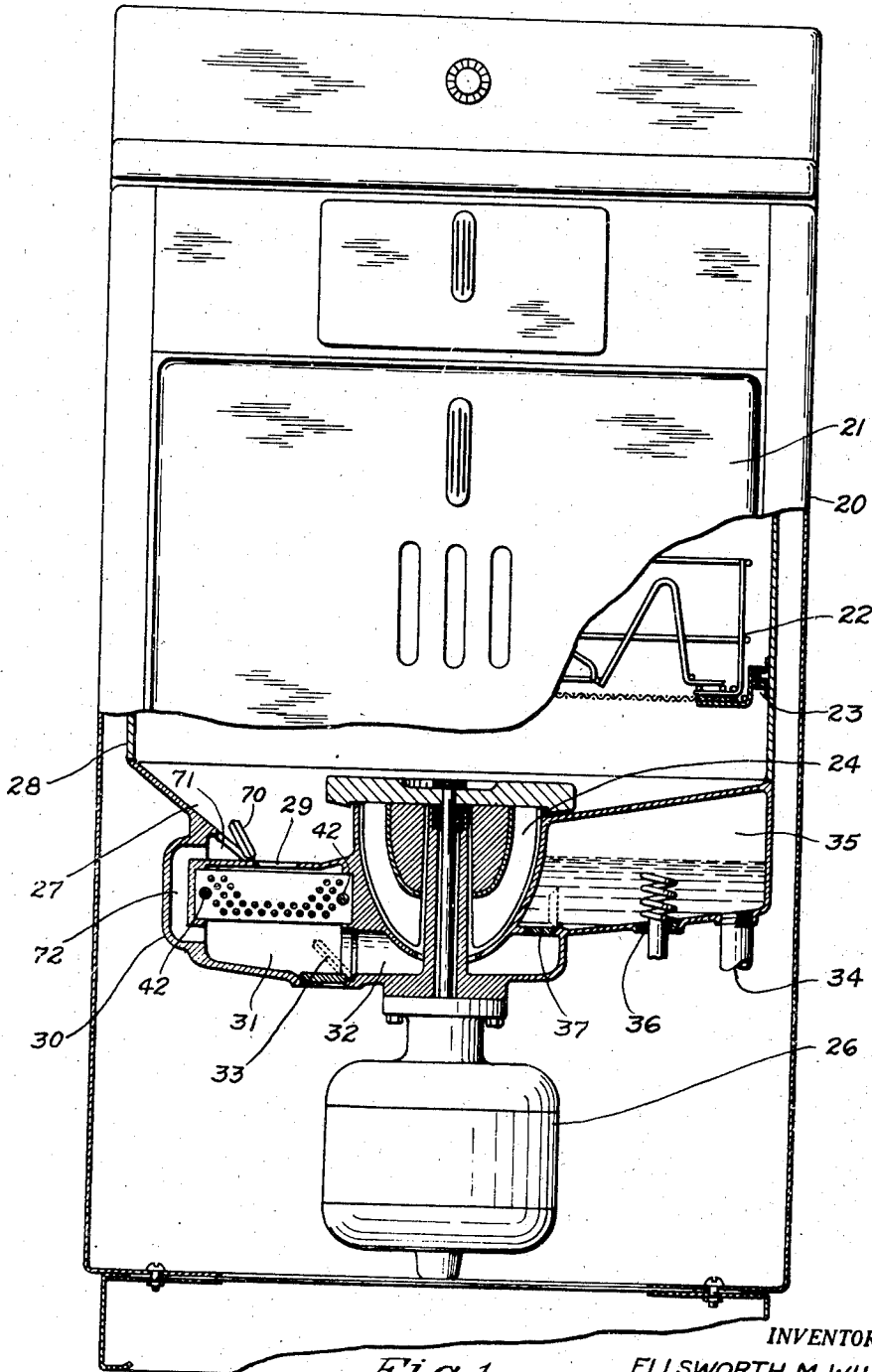


Fig. 1

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2 Sheets-Sheet 2

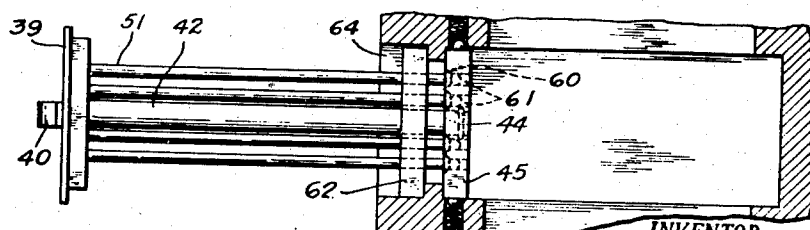
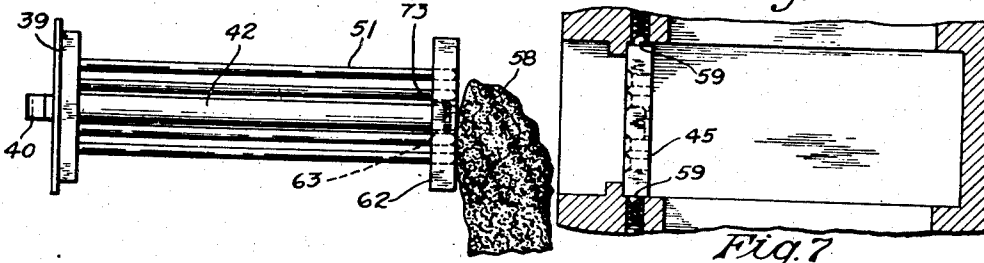
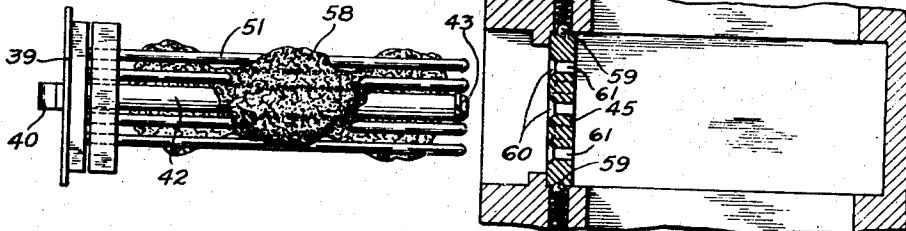
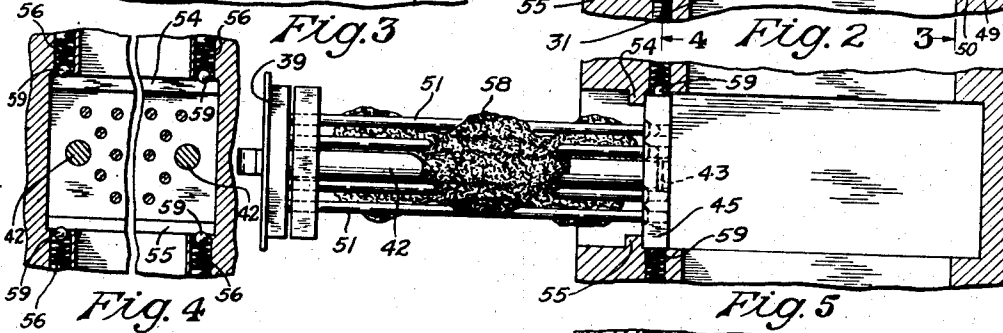
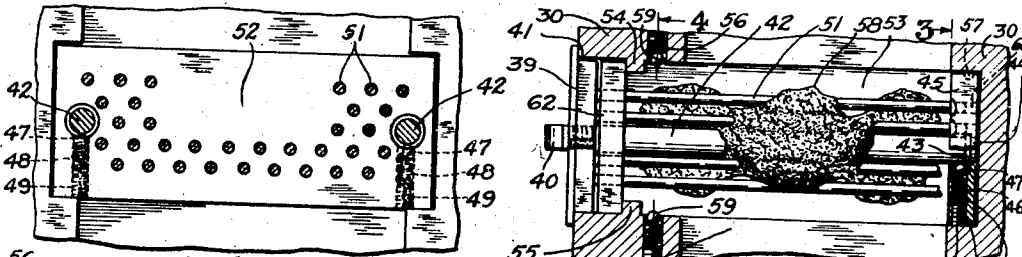


Fig. 8

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UNITED STATES PATENT OFFICE

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FILTER

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5 Claims. (Cl. 210-169)

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This invention relates to a filter assembly which may be used to advantage in washing machines, and, particularly, those of the home dishwasher and home clothes-washing type. The device will be described in conjunction with a dish-washing machine, but it is to be distinctly understood that it may be used for other washing machines and other purposes.

It is desirable to provide washing machines of the aforementioned type with a filter for removing foreign material in the water. This is particularly true of a dishwasher wherein a comparatively small amount of water is recirculated in the machine. In the clothes-washer, the drain water may pass through a pump which requires removal of foreign material. The filter or strainer must be so arranged that it easily can be cleaned.

These and other objects of the invention may be seen from the following drawings and description which are merely exemplary.

In the drawings:

Fig. 1 is a vertical view, partially in section, showing a dishwashing machine with a filter of the present invention contained therein.

Fig. 2 is a sectional side elevation of the filter when in place in the machine of Fig. 1, debris or dirt being diagrammatically shown on the elements of the filter.

Fig. 3 is a vertical section taken along the line 3-3 of Fig. 2.

Fig. 4 is a broken vertical section taken along the line 4-4 of Fig. 2.

Fig. 5 is similar to Fig. 2, with the exception that the filter rod assembly is partially withdrawn.

Fig. 6 is similar to Fig. 5, with the exception that the filter rod assembly has been completely withdrawn.

Fig. 7 is similar to Fig. 6, with the exception that the cleaning and guide plate has been operated to remove debris from the assembly.

Fig. 8 is similar to Fig. 7, with the exception that the rod assembly has been started back into position in the machine.

Referring to Fig. 1, a dishwasher is shown having an outer casing 20 with a front door 21 and removable dish rack 22 held in tray support 23. A rotor 24 is driven by motor 26 for circulating a water spray upwardly about the dishes contained in dish basket 22. All of these features are conventional and may take this or other forms well known in the art.

The water returning from the spray is caught in the bottom 27 of the spray compartment 28

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and directed to the opening 29 so as to pass through the filter assembly. During the washing cycle, water passing through the filter assembly enters the chamber 31 and is then carried into chamber 32 where it is drawn into the rotor 24 and again circulated over the dishes. Drain valve 33 is provided for removing water from the machine upon completion of the washing operation. This valve may be operated automatically or in any desired manner. Incoming water may be fed through the pipe 34 into compartment 35 wherein can be located a heater element 36 for pre-heating the water before it is introduced into the circulation system through valve 37, said valve being operated automatically or in any desired way. The filter may be carried in an aperture in the frame 30 of the washing machine, but it is evident that other supporting means may be provided than the one shown, depending upon the particular machine and use for which the filter is employed, and the term housing aperture includes various types of housings.

During the rinsing portion of the washing cycle, or when the filter is not to be used, valve 70 may be provided and operated in any suitable manner for by-passing the filter. When port 29 is closed by valve 70, the water will follow passage 72 to chamber 31 and thence to the impeller 24 through chamber 32. Rinse water may be drained through the filter by operating valve 70 to close 71 and open valve 33 to a position closing the port to chamber 32.

Referring to Fig. 2, the frame of the machine is shown at 30 with the chamber below the filter indicated at 31. The filter comprises a front cover plate 39 having a handle 40 for removing the same from the front of the machine frame 30. This cover may be so designed as to have a watertight joint 41 with the frame of the machine, or a separate water-tight door may be provided in frame 30. Attached to the front cover plate 39 are rods 42 (Figs. 2 and 3). These rods can have a split ring or projection 43 placed on the right-hand end thereof which enters the apertures 44 in the slidable rear guide plate 45, there being a detent 46 for keeping the rod and parts in the position shown in Fig. 2. Detent 46 may consist of ball 47, spring 48 and plug 49 located in a suitable aperture 50 in the rear guide plate 45. The aperture 44 has an enlarged bore facing the front of the housing and forming a shoulder against which ring 43 abuts and thereby releasably positioning plate 45 on the rod in conjunction with the detent.

The filter elements may comprise rods 51, said

3 rods being screwed, molded in, or otherwise fastened into the front cover plate 39. The rods may be of metal, plastic, or any suitable material. The rods may be arranged in various manners in accordance with the desired filter arrangement and may be spaced in accordance with the filter action desired. As shown in Fig. 3, the rods are arranged in diagonal rows and the central portion thereof omitted to form a basket space 52. Merely as an example, the rods might be $\frac{3}{4}$ " in diameter and diagonally spaced $\frac{1}{4}$ " apart. At the front end of the filter chamber 53, there are transverse ribs or retaining ledges 54 and 55. To the right of the ribs and ledges, there is located a set of detents which may comprise balls 59, springs 56, and a suitable backing member therefor (not shown), said detents being arranged to coact with mating indentations 57 in the rear guide plate 45.

After dirt has accumulated on the filter, such as shown diagrammatically at 58, it is desirable to clean the filter. The first operation is that shown in Fig. 5, wherein the front cover plate is pulled to the left, which moves with it the rear guide plate 45 until said guide plate is stopped by retaining ledges 54 and 55. The guide plate is held in position by means of detents 59. Further movement to the left, or withdrawal (Fig. 6), will separate the guide rods 42 and filter rods 51 from the rear guide plate 45, detents 46 allowing ring 43 to be withdrawn from aperture 44. Rear guide plate 45 may have the apertures receiving the filter rods 51 slightly countersunk, as shown at 60 in Fig. 6, with rods 51 loosely fitting in holes 61.

The next operation in the cleaning of the filter is shown in Fig. 7, wherein the cleaning and rod guide plate 62 is moved to the rear in such a manner as to strip off the dirt from the rods. The cleaning and rod guide plate 62 may have apertures 63, through which the rods 42 pass with a stop or annular shoulder 73 made by having the aperture enlarged at the end facing the rear of the housing, so that the front guide plate 62 will not be entirely withdrawn from the filter assembly because ring 43 will contact shoulder 73. After the filter has been cleaned, the reassembly operation takes place, as shown in Fig. 8, wherein the cleaning and rod guide plate 62 is passed into the front opening 64 until it contacts the retaining ledges of the filter holder, and then as the cover 39 is moved to the right so as to move the rods 51, the ends of said rods will be guided into their apertures 60 of the rear guide plate 45.

Further movement of the front cover plate to the right, as shown in Fig. 8, will move the rear guide plate 45 to the right, disengaging the same from the detents 59 until the apparatus takes the position shown in Fig. 2.

As previously stated, other forms and arrangements of the filter rods may be used and the filter may be employed by itself in a conduit or in conjunction with other machines.

What is claimed is:

1. In an apparatus including a filter chamber, an inlet to said filter chamber and an outlet therefrom; filter means adapted to be removably positioned in said chamber between said inlet and outlet, said filtering means comprising an assembly of a removable side wall of said chamber, a plurality of substantially parallel filter rods uniformly spaced from each other in a lateral direction, rigidly attached to said wall and extending therefrom across said chamber transversely and laterally thereof, a cleaning plate provided with a plurality of apertures through which said rods pass, slidably mounted on said rods; and means in said chamber walls releasably engaging said cleaning plate to normally position it adjacent said removable wall, whereby when said filter assembly has been removed from said chamber said cleaning plate may be moved lengthwise of said rods to remove debris therefrom.

2. Apparatus according to claim 1 comprising guide rods secured to said removable side wall in substantially parallel relation to said filter rods, a filter rod supporting plate carried by said guide rods, said filter rod supporting plate comprising means adapted to receive and releasably support the ends of said guide rods.

3. Apparatus according to claim 2 comprising detachable connections between said supporting plate and said guide rods whereby said supporting plate is moved across said filter chamber as said filter means is withdrawn therefrom.

4. Apparatus according to claim 3 in which said filter chamber comprises an abutment adapted to engage and stop said supporting plate after said movement across said filter chamber, said detachable connections enabling the separation of said filter means from said supporting plate when said supporting plate is engaged by said abutment.

5. Apparatus according to claim 4 comprising yieldable detent means adapted to retain said supporting plate adjacent said abutment while said guide rods are detached from and reconnected to said supporting plate.

ELLSWORTH M. WILSON.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
55 62,002	Carmichel -----	Feb. 12, 1867
441,419	Jones -----	Nov. 25, 1890
594,013	Holthaus -----	Nov. 23, 1897
594,014	Holthaus -----	Nov. 23, 1897
960,649	Levy -----	June 7, 1910
60 1,192,757	Davis -----	July 25, 1916
1,817,376	Izquierdo -----	Aug. 4, 1931
2,201,790	Rouch -----	May 21, 1940
2,343,743	Breckenridge -----	Mar. 7, 1944