Aug. 11, 1942. H. F. BARIFFI 2,292,814

WASHING MACHINE

Filed Sept. 17, 1940

Fig. 1.

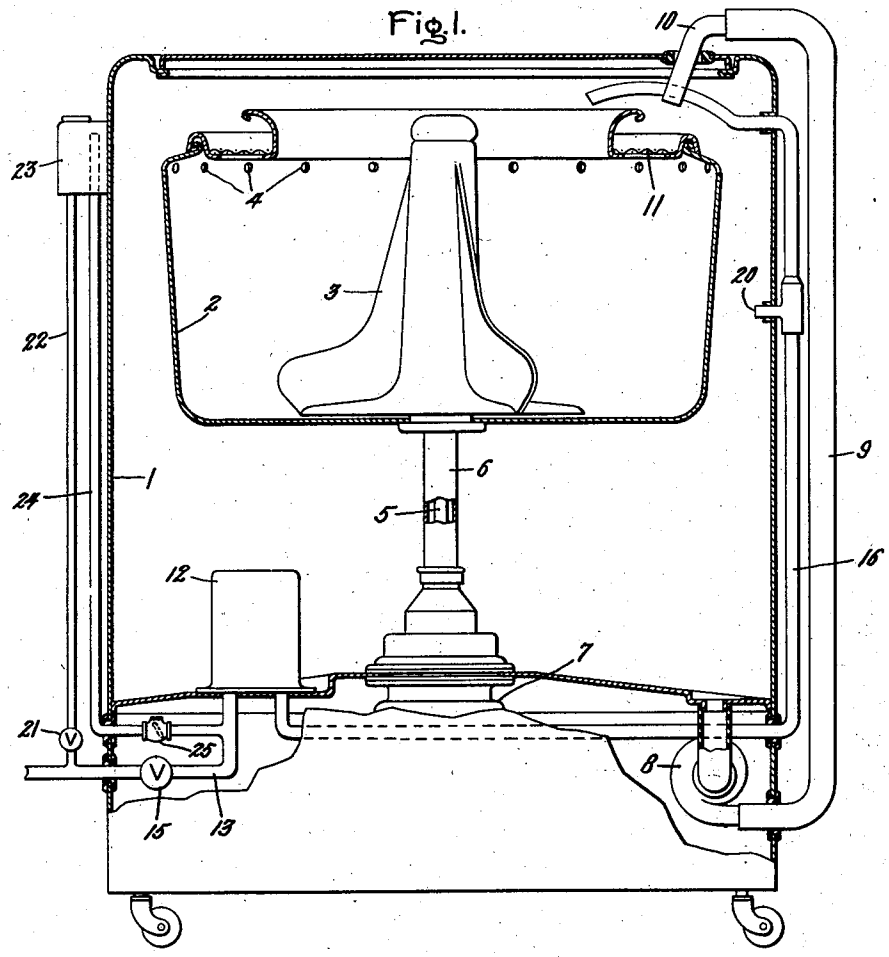
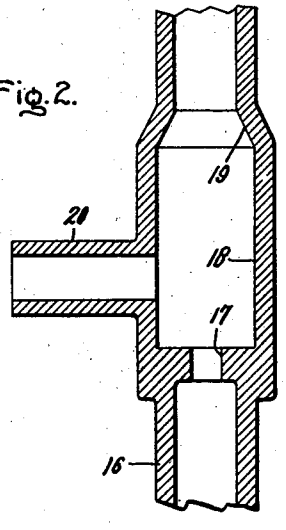


Fig. 2.



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WASHING MACHINE

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3 Claims. (Cl. 68—23)

The present invention relates to washing machines of the type having a water softener connected thereto for softening the water used in the machine.

After use it is necessary that the water softener be regenerated or reactivated by a salt water solution. It is obviously undesirable that the salt solution from the water softener be conducted to the washing compartment.

The object of my invention is to provide an improved construction for preventing flow of the salt solution into the washing machine tub during regeneration of the water softener.

For a consideration of what I believe novel and my invention, attention is directed to the following description and the claims appended thereto.

In the accompanying drawing, Fig. 1 is a sectional elevation of a washing machine embodying my invention; and Fig. 2 is an enlarged sectional view of the construction for controlling the flow of the water softener.

Referring to the drawing, there is shown a washing machine of the extractor type having an outer casing or tank 1 in the upper part of which is a tub or clothes receptacle 2 having a bladed agitator 3 therein. At the upper edge of the receptacle are openings 4 which define the liquid level in the receptacle during washing and serve as centrifugal discharge openings when the receptacle is rotated at its extracting speed to centrifugally dry the clothes. The agitator 3 is oscillated for washing and the receptacle is rotated for extracting by a vertical shaft 5 extending up through a sleeve 6 connected to the bottom wall of the outer casing 1. The shaft 5 is driven by suitable mechanism located in a gear casing 7 below the outer casing which may, for example, be that shown in Patent 2,161,618, G. W. Dunham. During washing, liquid is circulated by a pump 8 from the bottom of the outer casing up through a flexible hose 9 and discharge nozzle 10 onto an annual filter 11 carried on the upper rim of the receptacle. The excess liquid overflows through the openings 4 so that during the washing operation liquid is continuously withdrawn from the receptacle, filtered, and returned thereto.

Fastened to the bottom wall of the outer casing is a water softener 12 connected through a conduit 13 and valve 15 to the water supply. The discharge from the water softener is through a conduit 16 having its free end discharging into the top of the receptacle 2. Intermediate the ends of the conduit 16 is an injector comprising a restricted nozzle 17 discharging axially along the conduit 16 through an enlarged chamber 18 joined to the conduit 16 by a tapered section 19. Branching from the chamber 18 is a by-pass passage 20 discharging to the outer casing. By positioning the nozzle 10 so it discharges to a drain, water flowing through the passage 20 may be pumped from the outer casing to the drain. When the valve 15 is opened, water is supplied through the water softener 12 to the conduit 16 at such a rate that the injector action of the stream discharged through the nozzle 17 produces a suction on the passage 20 which prevents flow therethrough. In other words, all of the softened water flows into the receptacle since the passage 20 is blocked by the injector action of the stream flowing through the nozzle 17.

The water softener is regenerated by shutting the valve 15 and opening a valve 21 in a conduit 22 for conducting water from the supply to the compartment 23 which is filled with salt. The water flowing into the compartment 23 flows to the water softener through a conduit 24 and check valve 25. The valve 21 allows only a relatively small flow, so that the rate of flow of the salt solution through the water softener is much less than the rate of flow of the softened water. The rate of flow of the salt solution is such that the injector action produced by its flow through the nozzle 17 is insufficient to block the passage 20. The salt solution accordingly flows wholly through the passage 20 to the outer casing whence, as described above, it may be pumped to a drain.

The above described arrangement, without the use of valves or other moving parts, provides a simple control by means of which the softened water, having a high rate of flow, is conducted to the tub or receptacle while the regenerating salt solution, having a low rate of flow, is bypassed around the tub through a passage branching from the conduit leading from the water softener to the tub.

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

1. In a washing machine, a tub, a water softener, means for passing water to be softened through the softener at a predetermined rate, means for passing water through the softener at a lower rate while regenerating the softener, a conduit from the water softener leading to the tub, means including a passage from said conduit for conducting water to a drain, and means in said conduit having an injector action on said

passage for preventing outward flow through said passage at said predetermined rate of flow while permitting outward flow through said passage at said lower rate of flow.

2. In a washing machine, a casing, a rotatable receptacle in the casing for receiving clothes to be washed and centrifugally dried, a water softener, means for conducting water to be softened at a predetermined rate to the softener, means for regenerating the softener, means for conducting water at a lower rate from said regenerating means to the water softener, a conduit leading from the softener to the receptacle, a passage from said conduit to the casing, means in said conduit having an injector action on said passage effective to prevent outward flow through said passage during said predetermined rate of flow but not during said lower rate of flow, and means for draining liquid from said casing.

3. In combination, a water softener, a conduit leading therefrom, a passage branching from an intermediate point in said conduit, means for conducting water to the softener at a predetermined rate of flow during softening, means for conducting water to the softener at a rate of flow lower than said predetermined rate of flow during regeneration, and means in said conduit having an injector action on said passage preventing outward flow through said passage during said predetermined rate of flow but not during said lower rate of flow.

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