June 17, 1947. V. HANSON 2,422,545

REGULATING MEANS FOR WASHING MACHINE AGITATORS

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Fig. 1.

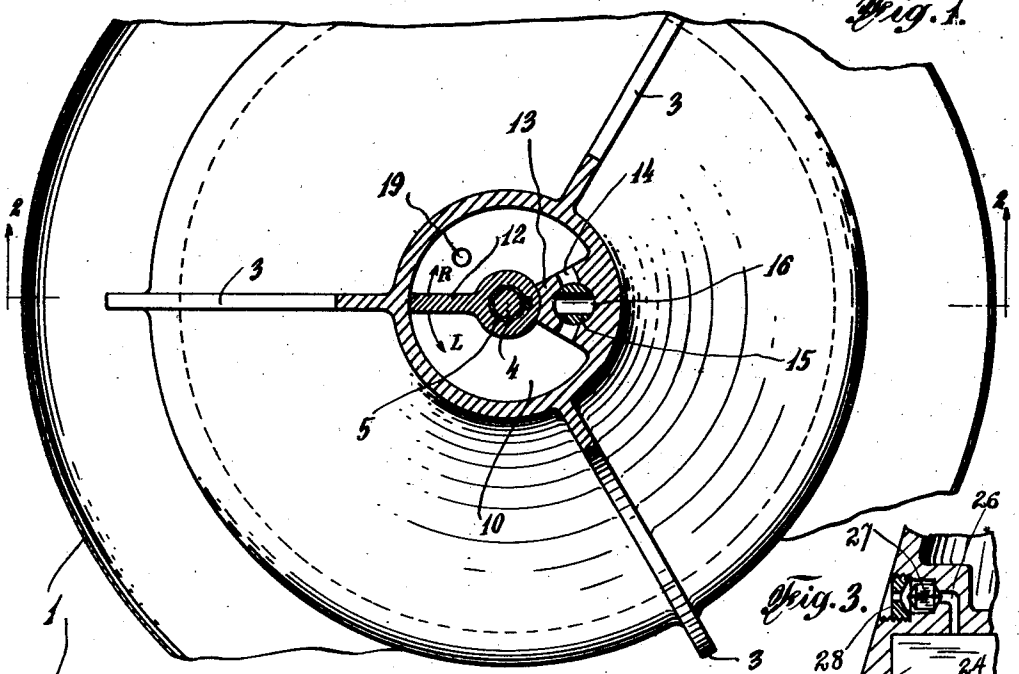


Fig. 3.

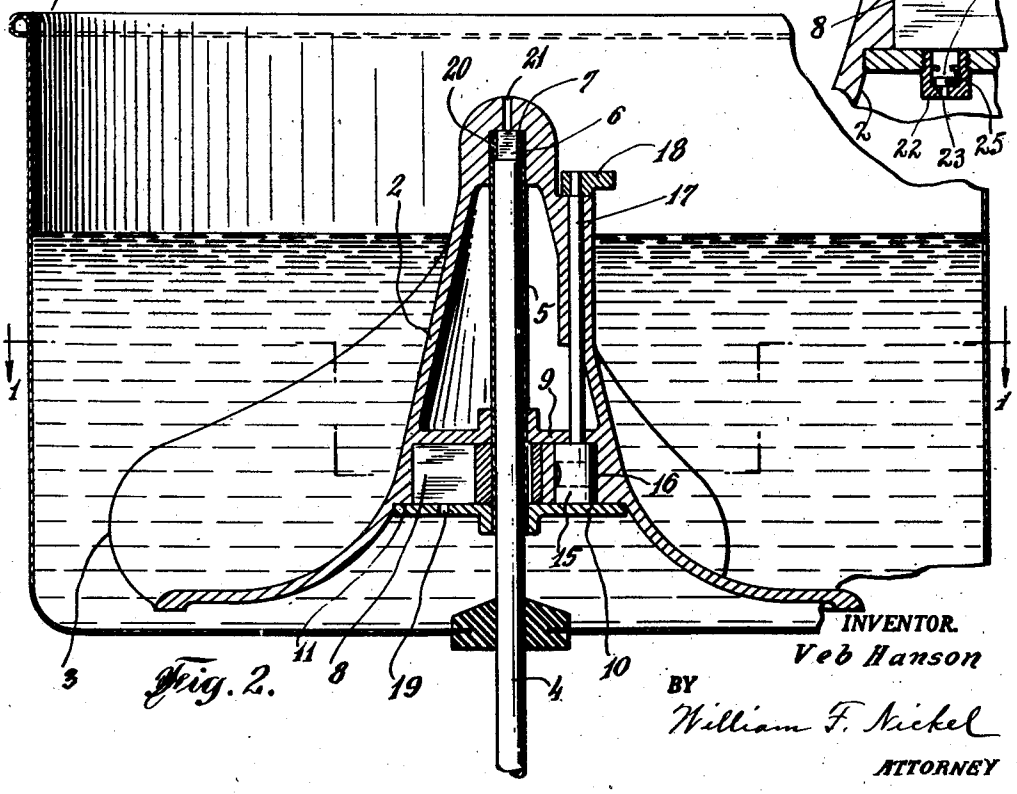


Fig. 2.

INVENTOR.
Veb Hanson
BY
William F. Nickel
ATTORNEY

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REGULATING MEANS FOR WASHING MACHINE AGITATORS

Veb Hanson, Fairfield, Conn., assignor of two-thirds to John N. Ledbetter, Jr., New York, N. Y.

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2 Claims. (Cl. 68—133)

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My invention relates to improvements in regulators for washing machines; especially washing machines for ordinary domestic or family use.

An object of the invention is to provide a simple and easily operated construction, adapted to be installed in any washing machine of conventional type and to enable the operation of the machine to be controlled according to the nature of the fabric to be cleansed and other working conditions.

In its preferred form the device comprises an agitator consisting of a hub with vanes thereon, designed to be fitted upon the upper end of the usual drive shaft in the tank of the machine. On the inside of the hub is a chamber, and rigid with the shaft in said chamber is a piston. The chamber is filled with water or other liquid, and as the shaft turns, the piston presses upon said fluid and sets the agitator into motion. A suitable valve in the hub controls the passage of the fluid from one side of the piston to the other. This valve has a stem projecting to the exterior of the hub so that it can be set in any desired position. Thus the passage of the fluid and the speed of the agitator can be varied.

Other objects and advantages are set out in the following description, and the novel characteristics are defined in the claims. But in practice many changes may be made in the details of the mechanism herein set forth without deviation from the principle of the invention.

On said drawings

Figure 1 is a horizontal section of a washing machine with my invention installed therein; on line 1—1 of Figure 2; and

Figure 2 is a section on line 2—2 of Figure 1, and

Figure 3 is a detail showing a modification.

The same numerals identify the same parts throughout.

The tank or reservoir of a washing machine is shown at 1. Inside of the tank is an agitator comprising a hub 2 carrying fixed vanes 3. The drive shaft 4 extends up into the tank through the bottom, and is turned or oscillated by connection with a suitable source of power. The agitator has a central sleeve 5 therein, and the hub 2 is engaged with this sleeve at both ends of the latter. The upper end of the shaft is squared as indicated by the numeral 6; and the end of the sleeve at the upper part of the hub 2 is likewise made square as indicated at 7; so that it can be operatively engaged by the shaft 2. The lower end of the sleeve is open.

My invention is closely associated with the agitator which contains means constituting a fluid

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coupling between the hub 2 and member 4. The hub is preferably hollow and has a chamber 8. This is formed by a web 9 across the inside of the hub, this web being the top wall of the chamber 8. At the bottom the chamber is open, but is kept closed by a plate 10, engaging a shoulder 11, and is held tightly in place by removable fasteners such as bolts or screws. Within the chamber, and affixed to the sleeve 5 by a key is a piston blade 12, and engaging the hub of the piston at one side of the chamber is a fixed abutment 13. This abutment cooperates with the piston to form two compartments. A duct 14 in the abutment connects the two compartments and the effective size of the duct is determined by a rotary valve 15 having a port 16 extending through it from side to side. According to the position of this valve the duct 14 is fully open, partly open, or closed, so that communication between the two compartments of the chamber 8 on both sides of the piston is free, restricted or interrupted. The valve has a stem or controlling member 17 which projects from the hub 2 at the top, where it has a knob 18 by which the valve can be set. The chamber 8 is filled with fluid, or drained, through an opening 19 in the plate 10. The sleeve 5 is free in the upper part of the hub 2, web 9 and plate 10; it goes through the web and plate and the sleeve has the key on it for the piston 12 between them. The agitator is installed by letting it down over the shaft 2, till the squared end of the shaft at the top enters the upper squared end of the sleeve 5. The plate 10 of course is detachably engaged with the sleeve.

When the shaft 4 oscillates, the agitator is actuated. The piston 12 presses on the fluid in the chamber 8 and forces it against the abutment 13, and the agitator swings from side to side in the tank. When the port 16 of the valve is out of registry with the duct 14, the speed of the agitator is a maximum; because then there is no escape for the fluid in front of the piston on each stroke. When the valve is turned to open the duct 14 in part, the speed falls, and when the duct 14 is fully opened, the agitator swings very slowly. Hence the operation of the machine can be regulated with ease and certainty. All that the housewife or other user of the machine has to do is to manipulate the knob 18, to adjust the element 15.

An agitator of the kind above described can be produced for virtually any type of machine with upright drive shaft and oscillating agitator now on the market, without necessitating any alterations in construction or design. The cost of making is not large, the operation is sure, and

the device is unlikely ever to get out of order. The chamber, piston and valve can be inspected or repaired by removing the plate 10. When the machine is filled with water, and the water is drained off, the chamber likewise is drained by way of the opening 19 in the closure plate 10.

The sleeve 5 is free in the hub 2 at the top and in the web 9 and plate 10. Thus it does not have an airtight fit at either point. Hence when the hub is in place on the shaft 4, and the water is turned on to fill the tank 1 the fluid will pass in at the aperture 19 and slowly fill the chamber 8; and the air will be forced out between the top of piston 12 and the web 9; the piston fitting loosely enough; between the sleeve 5 and the rim of the hole in the web 9 filled by the sleeve; and along the outer surface of the tube 5 at the top where it enters the bore or recess 20 in the top of the hub 2; this bore being round. This bore communicates with the outer atmosphere above the water in the tank 1 through a small duct 21. When the washing is done and the water drained from the tank 1; the chamber 8 also drains by way of the port 19. This port is quite small and when the piston 12 oscillates, not enough water can be expelled by it through this port to affect the desired operation of the agitator.

In practice the hub of the piston 12 fits easily against the concave end of the abutment, which serves as a seat for this member.

The top of the chamber of the modification shown on Fig. 3 has an air escape duct 26 in an enlargement or thickened part of the web 9. This duct is enlarged at the outer surface of the hub 2 to provide a shoulder or seat for a squared valve 27 with pointed ends. In the enlarged end is screwed a perforated plug 28. The valve can move between this plug and seat, so that air can leave the chamber but no water can enter. As the piston moves from side to side the valve 27 also prevents loss or escape of water from the chamber 8. Likewise, if desired, a valve may be provided to prevent escape of water through the plate opening 19 as the piston moves. A perforated plug 22 is screwed or otherwise affixed in the opening 19 to mount a disk valve 24 therein. This valve rests on a seat 23, and its upward motion is limited by stops 25 in the plug 22. This

valve thus admits water, but will not allow it to flow out. But the chamber can be drained at any time merely by lifting the valve 22 from its seat 23.

The structure herein illustrated and described is therefore well calculated to serve all the purposes of the invention; and while I have presented the best embodiments now known to me, I do not wish to be limited to the exact features of construction here disclosed; but reserve the right to make any and all changes that fall within the meanings of the broad and general terms in which the claims are expressed.

Having described my invention, what I believe to be new is:

1. An agitator for a washing machine having a hollow hub with vanes thereon, a drive shaft on which the hub is mounted, a tube surrounding the shaft and secured at its upper end to the shaft, the hub having a chamber surrounding the tube near its lower end, means forming an abutment at one side of the hub in said chamber, a piston affixed to the tube in the chamber, said abutment having a passage therethrough, valve means for controlling the size of the passage, and a valve actuating member connected to said valve means and extending through the hub to a point adjacent the upper part of the agitator, the chamber having an inlet for liquid and means for venting air therefrom.

2. The agitator for washing machines according to claim 1, wherein said chamber also has an admission valve controlling said inlet and the means for venting air comprises a one-way discharge valve.

VEB HANSON.

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