Aug. 16, 1949. L. E. DELOGHIA 2,479,535

OPERATING MECHANISM FOR WASHING MACHINES AND THE LIKE

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Fig. 1.

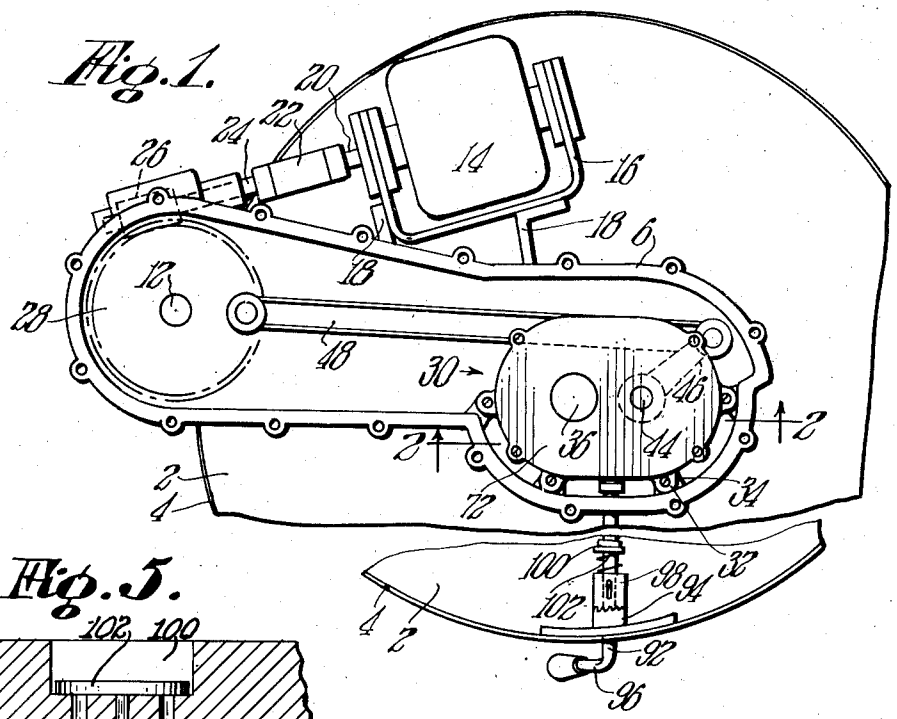


Fig. 5.

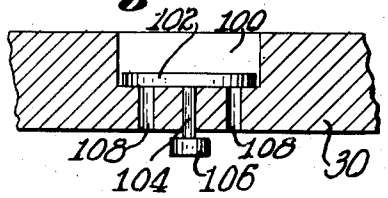


Fig. 2.

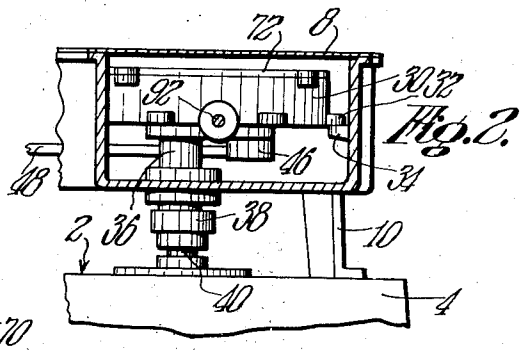


Fig. 3.

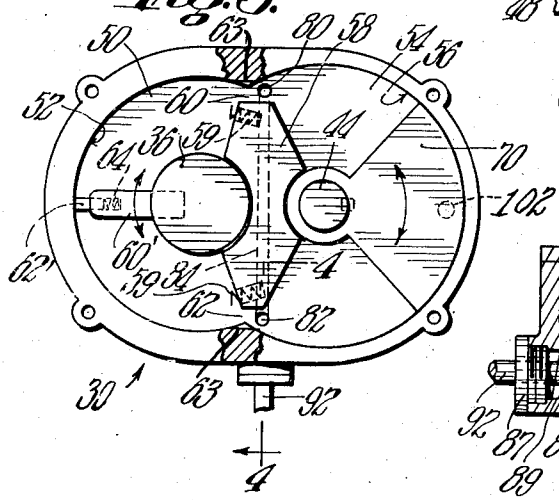
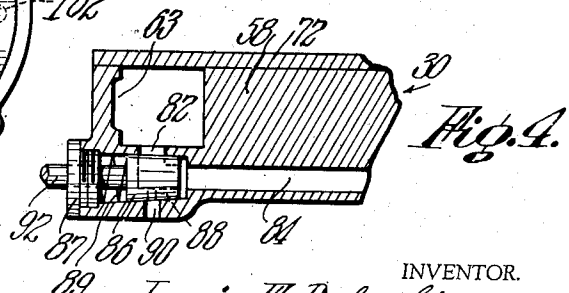


Fig. 4.



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OPERATING MECHANISM FOR WASHING MACHINES AND THE LIKE

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1

This invention relates to the improvements in operating mechanism and it is directed more particularly to operating mechanism for oscillating a shaft back and forth.

The principal objects of the invention are directed to the provision of mechanism for oscillating a shaft back and forth through various predetermined angles. That is for oscillating a shaft in such a way that the oscillations thereof may be readily and easily varied between zero and a maximum at the will of the operator.

The novel features of the invention will be described with particular reference to what is known as domestic washing apparatus. In such apparatus a shaft carrying an agitator in a tub is oscillated in opposite directions. With such apparatus since certain materials require more or less agitation than others, it is desired to vary the extent or angle of oscillations and to that end the novel means of this invention are adapted but it will be understood that it is not desired to be so limited.

With the foregoing and various other novel features and advantages and other objects of my invention as will become more apparent as the description proceeds, the invention consists in certain novel features of construction and in the combination and arrangement of parts as will be hereinafter more particularly pointed out in the claims hereunto annexed and more fully described and referred to in connection with the accompanying drawing wherein:

Fig. 1 is a partial inverted plan view of a washing machine tub having the novel mechanism of the invention associated therewith;

Fig. 2 is an elevational sectional view on the line 2—2 of Fig. 1;

Fig. 3 is an enlarged inverted plan view of the essential features of the driving mechanism shown with the cover of the casing therefor removed;

Fig. 4 is an enlarged sectional elevational view on the line 4—4 of Fig. 3; and

Fig. 5 is an enlarged partial sectional view through a wall of the casing having a check valve associated therewith.

Referring now to the drawing more in detail, the invention will be fully described.

The bottom wall of a washing machine tub is represented by 2 upwardly from which extends the side wall 4 of said tub. A housing is represented by 6 with which a cover 8 encloses the mechanism of the invention. A portion of the cover is shown in Fig. 2 and is secured to the housing in the usual manner. The housing and

2

cover as in ordinary washing machine construction are made to contain the driving mechanism and a supply of lubricant such as oil.

The housing 6 is secured to the tub in any convenient manner as by brackets, such as 10. A shaft 12 is journalled in the housing and extends upwardly at a side of the tub for operating a wringer which is usually disposed at the upper side of the tub.

A motor 14 is carried by a bracket construction 16 that is secured to the casing by members such as 18 and has its shaft 20 connected by a coupling 22 to a worm shaft 24 which is journalled in the housing. A worm 26 on the shaft 24 is in operative engagement with an operating member such as a worm gear 28 fixed on the shaft 12.

When the motor is in operation the worm gear and shaft 12 are rotated by the motor through the means described and provide the source of power for the mechanism.

A casing 30 is secured to the housing in some suitable manner as by lugs 32 thereof which are secured to lugs 34 of the casing but any other means may be employed. An oscillatable shaft 36 is journalled in the casing 30 and it may extend upwardly into the tub for carrying a paddle or agitator of usual form. In the drawings the shaft 36 is connected by a connector 38 to an agitation or paddle shaft 40 which extends upwardly into the tub. This oscillatable shaft 36 may be called the driven shaft or member.

A driving shaft or member 44 is also journalled in the casing. A lever 46 is secured to the shaft 44 and has its free end connected by a link 48 to the worm wheel 28, as shown, so that as said wheel rotates the lever 46 is swung or rocked back and forth thereby to oscillate the drive member or shaft 44. The casing is provided with a driven chamber 50 having a circular wall 52 and a driving chamber 54 having a circular wall 56. A partition 58 is disposed between the chambers 50 and 54 and is arranged so as to provide passageways 60 and 62 between the chambers 50 and 54.

A vane 60′ is secured to the oscillatable shaft 36 and a blade 62′ in the free end thereof is urged outwardly by a spring 64. The blade 62′ is in yieldable engagement with the surface 52 so as to traverse said surface 52 when the shaft 36 is oscillated. This vane and blade construction may be called a driven member.

An impeller 70 is fixed to the driving shaft or member 44 and a cover 72 is provided for securing to the casing to close the chambers 50 and

54. The chambers are filled with a gas or liquid or some element which may be acted upon by the impeller so that the driven element is acted upon thereby. As an example, a fluid such as oil is carried by the chambers and may be lubricating oil with which the housing is filled.

As the impeller 70 is oscillated back and forth by movements of lever 46 liquid in the chamber 54 at either side of the impeller is displaced thereby and forced alternately through the passageways 60 and 62. The liquid acts on the driven member 60' to bring about oscillations thereof thereby to oscillate the shaft 36. The angle of oscillations of the shaft 44 is constant but may of course be varied by varying the proportions of the parts connected to the shafts 12 and 44.

It is desired according to the invention to vary the angle of the oscillations of the shaft 36 and thereby vary the angle of oscillations of the agitator within the tub. To accomplish this in one way ports 80 and 82 associated with casing 30 (see Figs. 3 and 4) are connected by a passageway 84 which is separate from the chambers.

A control member 86 for the control of liquid between the ports is in the form of a valve that is rotatable as shown in Fig. 4. This control member 86 has an aperture therethrough and an auxiliary aperture 88 as shown for registering with a bleed port 90 in the casing. The valve 86 may be set so that as the driving member 70 oscillates the liquid in chamber 54 flows back and forth through the passageway 84 and communicating ports in which event the liquid will not act on and oscillate the driven member.

Accordingly as the passage of liquid through the passageway 84 is controlled the angle of oscillations of the driven member are controlled. With the control member 86 in a closed position relative to the ports and passageway so that no liquid will pass through the passageway 84 the action of the impeller will bring about the maximum oscillations of the driven member. Thus between the open and closed positions of the control member the driven member may be oscillated through various angles from zero to maximum.

It is possible to control or determine the degree of oscillations of the driven member within fine limits by manipulation of the control member 86 and in that way it is possible to accommodate the degree of oscillation of the agitator or paddle in the washing machine to the requirements of the materials being washed.

The control member 86 may be actuated in any desired manner but in the form of the invention shown a shaft 92 extends from the member 86 that is rotatable in a bearing 94 secured to the tub and has a part 96 extending upwardly at the side of the tub which is manually engageable for rotating the said control member. A collar 98 on the shaft 92 is slidable but non-rotatable thereon and has a serrated end for engagement with the serrated end of the member 94. A collar 100 is fixed on the shaft 92 and a spring 102 between the collar and member 98 urges said member 98 into engagement with the member 94 so as to releasably hold the rod or shaft 92 in various positions of adjustment.

There may be a check valve construction associated with the casing 30 which will admit lubricating oil thereinto from the housing but prevents oil from discharging into the housing. When the valve or control member 86 is set in the position shown in Fig. 4 oil may be forced from the casing by the impeller through port 90 and oil then may enter through the check valve. In this way a change of oil in the casing will result.

The check valve construction is shown in Fig. 5 where the casing 30 is provided with a cavity 100. A valve disc 102 has a stem 104 slidable in the casing wall and is provided with a head to limit upward movement of the disc. Holes 108 extend through the casing which are closed by the disc 102 when it is under pressure.

To hold the valve or control member in operative position there may be a spring 89 bearing thereagainst in cooperation with a member 87 threaded into the casing 30.

When the mechanism is put in operation there is a likelihood that the parts are in such a relative position that the liquid causes member 60 to bring up against a side of the partition 58.

Springs 59 are provided against which opposite sides of the member 60' may engage to cushion the action of the member 60' and as the member 60' approaches a side of the partition 58 the blade 62' overruns grooves 63 in the casing so that fluid is forced from chamber 50 past member 60' into chamber 54. Thus any excess forces established at either side of member 60' is equalized so that it is actuated by the liquid displaced by the impeller.

The invention may be embodied in other specific forms without departing from the essential characteristics thereof. Hence, the present embodiments are therefore to be considered in all respects merely as being illustrative and not as being restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all modifications and variations as fall within the meaning and purview and range of equivalency of the appended claims are therefore intended to be embraced therein.

What it is desired to claim and secure by Letters Patent of the United States is:

1. Operating mechanism for oscillating a driven member back and forth in opposite directions comprising in combination, housing means having drive and driven chambers for fluid and separate displacement connections connecting opposite ends of one chamber to opposite ends of the other chamber and a control connection having its opposite ends in communication with said displacement connections, an impeller oscillatable alternately back and forth in said drive chamber adopted to displace fluid alternately through said displacement connections or alternately in opposite directions through said control connection, means for oscillating said impeller back and forth through a constant angle, control means in said control connection for controlling the flow of fluid therethrough, a driven member oscillatable back and forth through various angles in said driven chamber accordingly as liquid displaced through said displacement connections by said impeller acts on opposite sides thereof, stop means at opposite ends of said driven chamber against which opposite sides of the driven member may abut at opposite ends of its back and forth movements to limit said movements, and connections between opposite ends of said driven chamber and displacement connections whereby as one side of said driven member is caused to abut said stop means at one end of said driven chamber by fluid acting on its opposite side said fluid may flow from said driven

chamber to an adjacent displacement passageway.

2. Operating mechanism for oscillating a driven member back and forth in opposite directions comprising in combination, housing means having driven and drive chambers for fluid and separate displacement connections connecting opposite ends of one chamber to opposite ends of the other chamber and a control connection having its opposite ends in communication with said displacement connections, an impeller oscillatable alternately back and forth in said drive chamber adopted to displace fluid alternately through said displacement connections or alternately in opposite directions through said control connection, means for oscillating said impeller back and forth through a constant angle, control means in said control connection for controlling the flow of fluid therethrough, a driven member oscillatable back and forth through various angles in said driven chamber accordingly as liquid displaced through said displacement connections by said impeller acts on opposite sides thereof, stop means at opposite ends of said driven chamber against which opposite sides of the driven member may abut at opposite ends of its back and forth movements to limit said movements, and connections between opposite ends of said driven chamber and displacement connections whereby as one side of said driven member is caused to abut said stop means at one end of said driven chamber by fluid acting on its opposite side said fluid may flow from said driven chamber to an adjacent displacement passageway, said connections including grooves providing in the housing means.

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