

June 28, 1955

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2,711,641

WASHING MACHINE HAVING WATER JET WASHING MEANS

Filed Sept. 15, 1952

2 Sheets-Sheet 1

Fig. 1

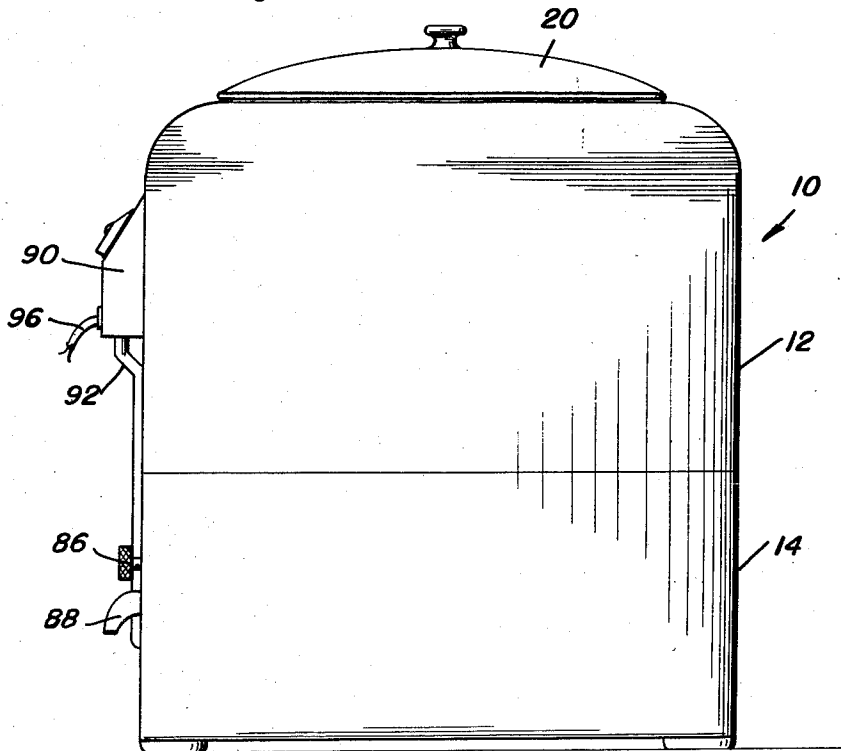


Fig. 5

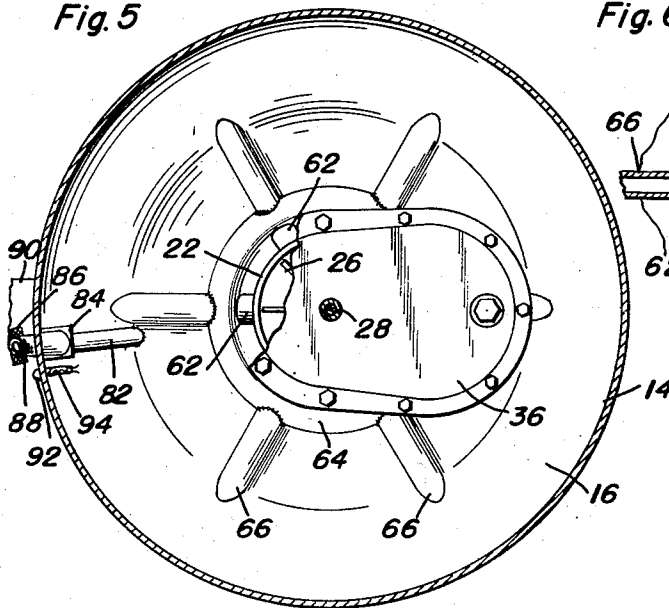
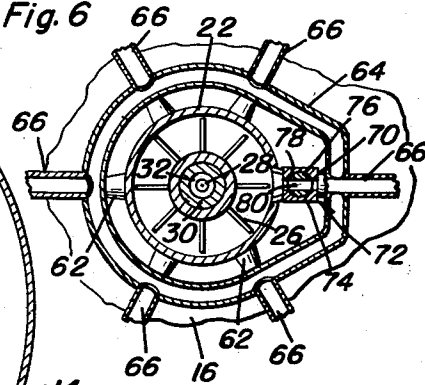


Fig. 6



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Fig. 2

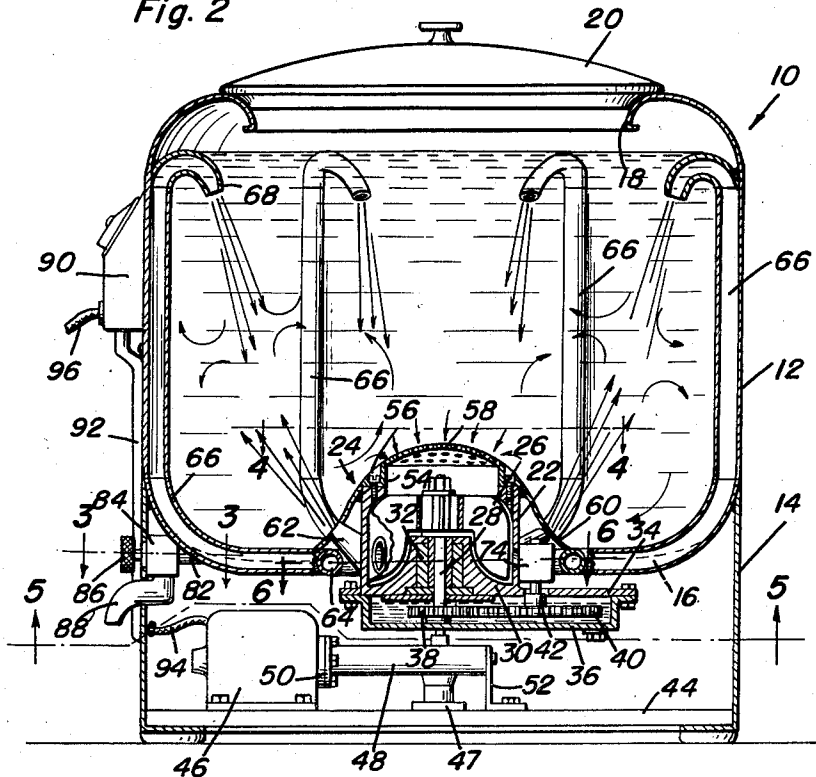


Fig. 3

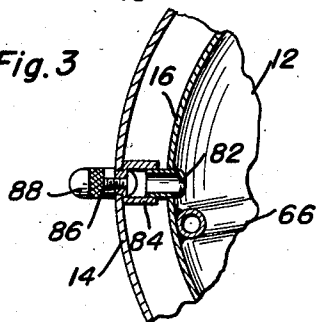


Fig. 4

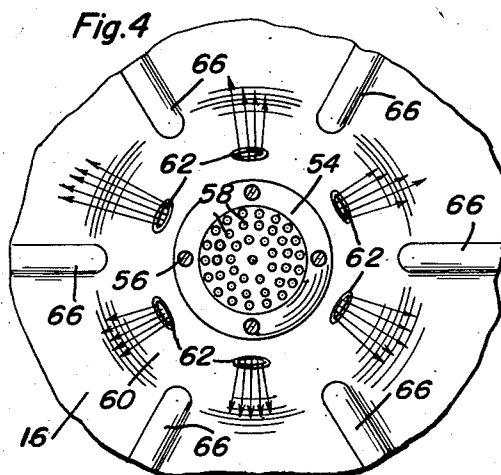
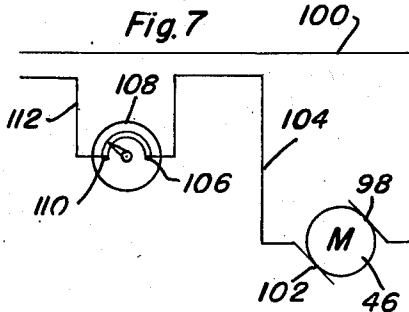


Fig. 7



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WASHING MACHINE HAVING WATER JET WASHING MEANS

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4 Claims. (Cl. 68—184)

This invention relates in general to laundry equipment, and more specifically to an improved mashing machine.

The primary object of this invention is to provide an improved washing machine which thoroughly cleans clothes disposed therein without subjecting the same to a mechanical action.

Another object of this invention is to provide an improved washing machine which utilizes jets of water for washing clothes disposed therein, said jets of water passing through the clothing and at the same time reciprocating the clothing with respect to water disposed therein.

Another object of this invention is to provide an improved washing machine which is of a relatively simple construction and which has a limited amount of mechanical moving parts whereby the life of the same is greatly extended.

A further object of this invention is to provide an improved washing machine which utilizes spray jets of water for cleaning clothes disposed therein, said spray jets of water facing each other in opposite directions and certain of the spray jets being cut on and off whereby the clothing is reciprocated vertically through water disposed in the washing machine.

With these objects definitely in view, this invention resides in certain novel features of construction, combination and arrangement of elements and portions as will be hereinafter described in detail in the specification, particularly pointed out in the appended claims, and illustrated in the accompanying drawings which form a material part of this application and in which:

Figure 1 is a side elevational view of the washing machine which is the subject of this invention and shows the general outline thereof;

Figure 2 is a transverse vertical sectional view taken substantially through the center of the washing machine of Figure 1 and shows the construction of the interior thereof;

Figure 3 is an enlarged fragmentary transverse horizontal sectional view taken substantially on the plane indicated by the section line 3—3 of Figure 2 and shows the general construction of a drain for the tub thereof and the relationship of a water passage mounted therein;

Figure 4 is a fragmentary horizontal sectional view taken substantially upon the plane indicated by the section line 4—4 of Figure 2 and shows the general construction of the bottom of the tub of the washing machine;

Figure 5 is a transverse horizontal sectional view taken substantially upon the plane indicated by the section line 5—5 of Figure 2 and shows the arrangement of the water passages under the bottom of the tub;

Figure 6 is a fragmentary transverse horizontal sectional view taken substantially upon the section line 6—6 of Figure 2 and shows the general arrangement of the water passages with respect to the pump and the position of the valve for alternately communicating one set of spray jets with the top of the washing machine; and

Figure 7 is a schematic wiring diagram showing the means for controlling the speed of a motor adapted to drive the pump of the washing machine.

Similar characters of reference designate similar or identical elements and portions throughout the specification and throughout the different views of the drawings.

Referring now to the drawings in detail, it will be seen that the washing machine, which is the subject of this invention, is referred to in general by the reference nu-

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meral 10. The washing machine 10 includes a generally cylindrical tub 12 which is mounted on and supported by a cylindrical housing 14. The tub 12 has a rounded bottom 16 and an open upper end. The upper end of tub 12 is provided with a central opening 18 through which clothes to be washed may be passed and is closed by a removable cover 20.

The bottom 16 of the tub 12 is provided with a cylindrical housing 22 which extends vertically above and below the same. The cylindrical housing 22 forms the housing of a centrifugal pump which is referred to in general by the reference numeral 24 and has mounted therein for rotation an impeller 26. The impeller 26 is mounted on a drive shaft 28 which extends upwardly through a bottom 30 of the housing 22 and is mounted in suitable bearings 32 carried thereby.

The bottom 30 of the housing 22 is provided with an extension 34 which forms a top cover of a removable gear case 36. Mounted within the gear case 36 is a first gear 38 which is mounted on the drive shaft 28 and a second gear 40 which is mounted on a valve shaft 42. It will be understood that the drive shaft 28 and the valve shaft 42 are mounted within the gear case 36 with any suitable bearings and that the gear 40 is driven by the gear 38.

The housing 14 of the washing machine 10 is provided with a base 44 on which is mounted a conventional power unit 46. The power unit 46 may be either in the form of an electric motor or an internal combustion engine depending upon the power source of the locality in which the washing machine 10 is to be installed. Carried by the base 44 centrally thereof is a journal 47 in which is mounted the lower end of the drive shaft 28 for rotation. Resting upon the journal 47 is a gear case 48 which has one end thereof connected by a flange 50 to the power unit 46 and the other end thereof supported by an L-shaped bracket 52 which is carried by the base 44. Mounted within the gear case 44 is suitable drive means (not shown) for drivingly connecting the drive shaft 28 to the power unit 46.

Referring now to Figure 2 in particular, it will be seen that the housing 22 is provided with a top cover 54 which has substantially the configuration of a segment of a sphere. The cover 54 is secured to the housing 22 by suitable fastening means 56 and is provided with a plurality of perforations 58. The housing 22 receives water therein through the perforations 58 for the interior of the tub 12 and the cover 54 functions as an inlet fitting for the pump 24.

Also carried by the housing 22 is a transversely curved annular extension 60 of the cover 54 which together with the cover 54 forms a hump in the central portion of the bottom of the tub 12. Communicating with the interior of the housing 22 and passing through the extension 60 is a plurality of water passages 62 which form a first set of water jets. The first set of water jets extend radially from the central portion of the tub 12 and slope slightly upwardly and outwardly so as to urge clothing struck by the same upwardly.

Surrounding the housing 22 in spaced relation thereto is a continuous water passage 64. The water passage 64 has communicating therewith a plurality of radially extending water passages 66 in the form of curved tubes. The tubes 66 follow the general contour of the bottom 16 of the tub 12 and projects upwardly along the side wall thereof. The water passages 66 terminate in downwardly directed curved tubes 68 which urge the jets of water passing therethrough downwardly. The jets of water passing through the curved tubes 68 form a second set of jets and the jets of water passing therethrough are urged downwardly and inwardly in opposed relation to the jets of water passing through the water passages 62. The action of the water jets from the curved tubes 68

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urge clothing disposed within the tub 12 downwardly and in combination with the water jets passing through the water passages 62 are intended to cause reciprocation of clothing within the tub 12 with respect to the water disposed therein in order to provide an effective cleaning action.

Referring now to Figure 6 in particular, it will be seen that the water passage 64 is communicated with the interior of the housing 22 by a water passage 70 which has mounted therein a valve mechanism which is referred to in general by the reference numeral 72. The valve mechanism 72 includes a generally rectangular valve housing 74 which is provided with a cylindrical bore 76. Disposed in the bore 76 for rotation is a valve member 78 which has a transverse bore 80 therethrough. The bore 80 is adapted to be aligned with the access of the water passage 70 and communicate the interior of the housing 22 with the interior of the water passage 64 to permit passage of water from the pump 24 into the water passage 64 and out of the water passages 66.

Referring now to Figure 2 in particular, it will be seen that the valve shaft 42 passes upwardly into the lower end of the valve housing 74 of the valve mechanism 72. The valve shaft 42 is connected to the valve member 78 and rotates the same in response to rotation of the drive shaft 28 of the pump 24.

In view of the foregoing, it will be seen that when the pump 24 is being actuated by the power unit 46, water is being forced out of the housing 22 into the water passages 62 and the water passage 70. Inasmuch as the valve mechanism 72 controls passage of water through the water passage 70, the water passing into the water passage 64 is alternately shut-off and permitted to run whereby the water jets passing downwardly out of the curved tubes 68 are intermittent. This permits clothing within the tub 12 to be alternately raised by the water jets passing out of the water passages 62 and urged downwardly by the water jets passing out of the curved tubes 68. This action not only permits the cleaning of the clothing disposed within the tub 12 by the direct action of the water jets thereon, but also permits the cleaning of the same by the forced movement thereof through the water disposed within the tub 12.

Referring now to Figures 2 and 3 in particular, it will be seen that opening into the bottom 16 of the tub 12 is a horizontal water passage 82. The water passage 82 is connected at its outer end to a valve 84 which is controlled by a handle 86 mounted exteriorly of the housing 14. Also connected to the valve 84 is a drain line 88 which is adapted to be communicated with the water passage 82 by the valve 84. It will be readily seen that water may be drained from the tub 12 by selectively manipulating the valve handle 86.

Referring now to Figure 2 in particular, it will be seen that mounted on the side of the tub 12 is a housing 90 in which is mounted a controller for the power unit 46 when the same is in the form of an electric motor. Extending downwardly from the housing 90 and communicating with the interior of the housing 14 is a conduit 92 in which is mounted electric wires 94 connecting the power unit 46 to the controller mounted within the housing 90. Also out of the housing 90 are electric wires 96 which may be connected to a suitable power source.

Referring now to Figure 7 in particular, it will be seen that there is illustrated the wiring diagram for the power unit 46 when the same is in the form of an electric motor. Connected to a first contact 98 of the power unit 46 is a wire 100 whose other end is connected directly to a power source. Connected to the other contact 102 of the power unit 46 is a wire 104 whose other end is connected to a terminal 106 of a controller 108, the controller 108 being disposed within the housing 90. Connected to the other contact of the controller 108, the contact being referred to by the reference numeral 110 is a wire 112 which is connected to a second line of a power source.

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By selectively positioning the controller 108, the speed of the power unit 46 may be varied as desired. Inasmuch as the pressure exerted on the water passing through the water passages 62 and 66 is directly controlled by the speed of the power unit 46, it will be seen that the action of the water jets may be varied as desired for different types of clothing. In this manner the life of the various types of clothing may be greatly extended and at the same time permitting the thorough cleaning of the same.

The operation of this device will be understood from the foregoing description of the details thereof, taken in connection with the above recited objects and drawings. Further description would appear to be unnecessary.

Minor modifications of the device, varying in minor details from the embodiment of the device illustrated and described here, may be resorted to without departure from the spirit and scope of this invention, as defined in the appended claims.

Having described the invention, what is claimed as new is:

1. A washing machine comprising a tub, a pump inlet fitting in said tub, a rotary pump carried by said tub and having an inlet connected to said pump inlet fitting, first and second water passages communicating with said pump, jets mounted in said tub and connected to said water passages, valve means controlling flow of water from said pump to one of said passages, means for continuously opening and closing said valve means simultaneous with the rotation of said pump.

2. A washing machine comprising a tub, a pump inlet fitting in said tub, a rotary pump carried by said tub and having an inlet connected to said pump inlet fitting, first and second water passages communicating with said pump, jets mounted in said tub and connected to said water passages, valve means controlling flow of water from said pump to one of said passages, means for continuously opening and closing said valve means simultaneous with the rotation of said pump, said jets facing in opposite directions to impart a reciprocating motion to clothes disposed in said tub.

3. A washing machine comprising a tub, a pump inlet fitting in said tub, a rotary pump carried by said tub and having an inlet connected to said pump inlet fitting, first and second water passages communicating with said pump, jets mounted in said tub and connected to said water passages, valve means controlling flow of water from said pump to one of said passages, means for continuously opening and closing said valve means simultaneous with the rotation of said pump, drive means for driving said pump, means for varying the speed of said pump to vary pressure of said jets.

4. A washing machine comprising a tub, a pump inlet fitting in said tub, a rotary pump carried by said tub and having an inlet connected to said pump inlet fitting, first and second water passages communicating with said pump, jets mounted in said tub and connected to said water passages, valve means controlling flow of water from said pump to one of said passages, means for continuously opening and closing said valve means simultaneous with the rotation of said pump, said jets facing in opposite directions to impart a reciprocating motion to clothes disposed in said tub, drive means for driving said pump, means for varying the speed of said pump to vary pressure of said jets.

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