

March 16, 1943.

F. BRECKENRIDGE ET AL

2,313,984

CLEANING APPARATUS

Filed April 25, 1941

3 Sheets-Sheet 1

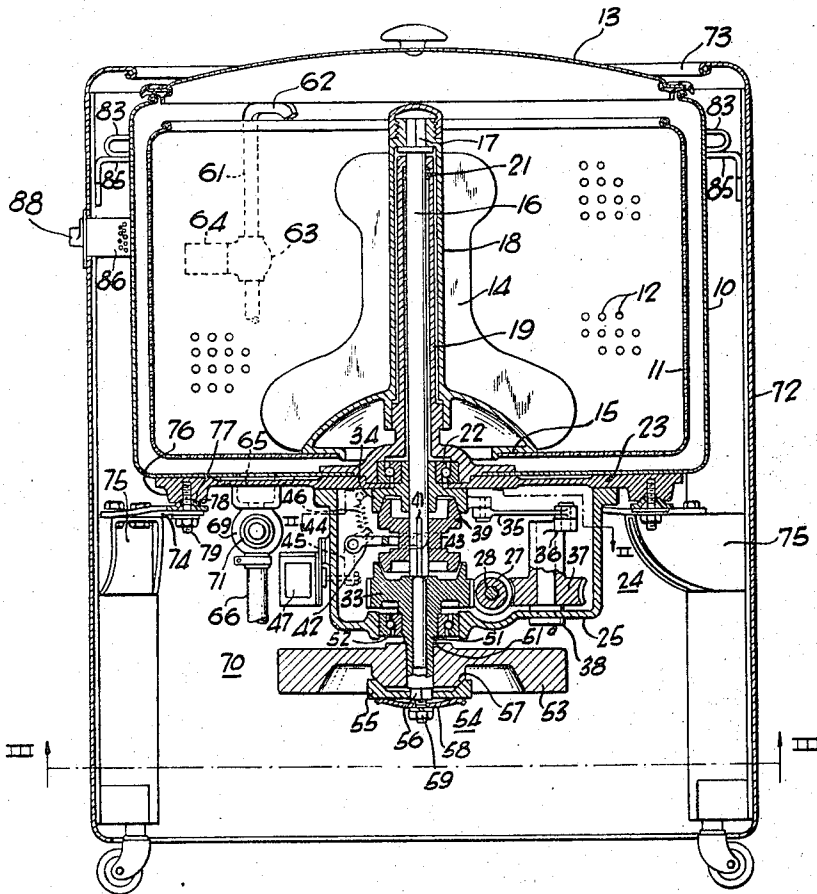


FIG. 1.

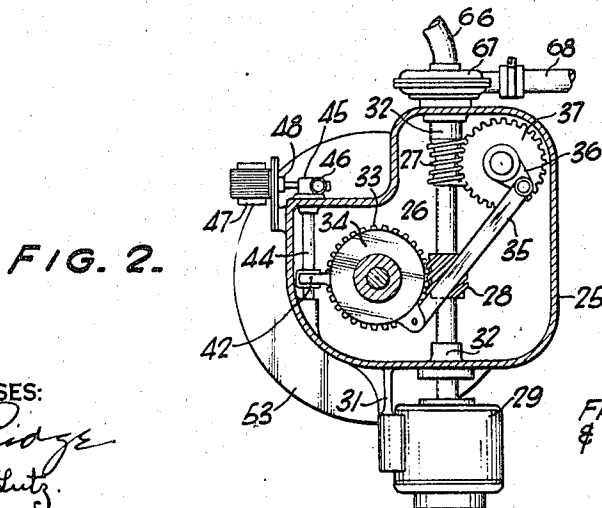


FIG. 2.

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3 Sheets-Sheet 2

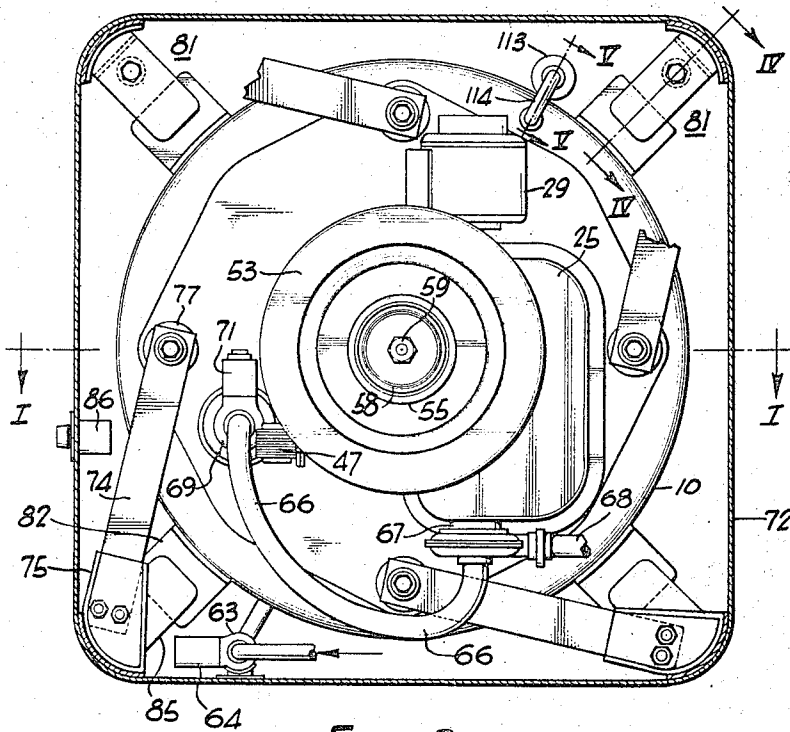


FIG. 3.

FIG. 4.

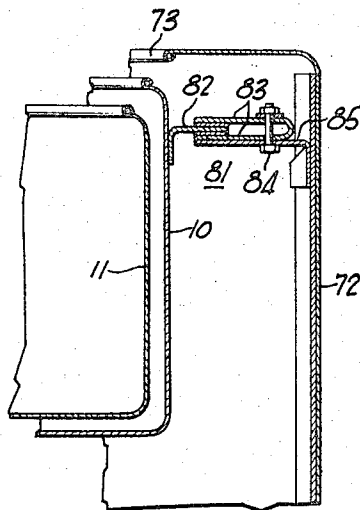
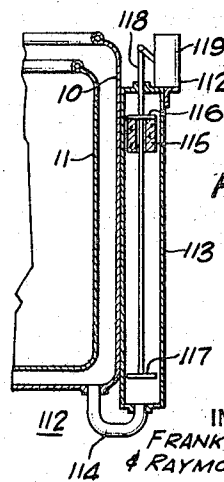


FIG. 5.



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3 Sheets-Sheet 3

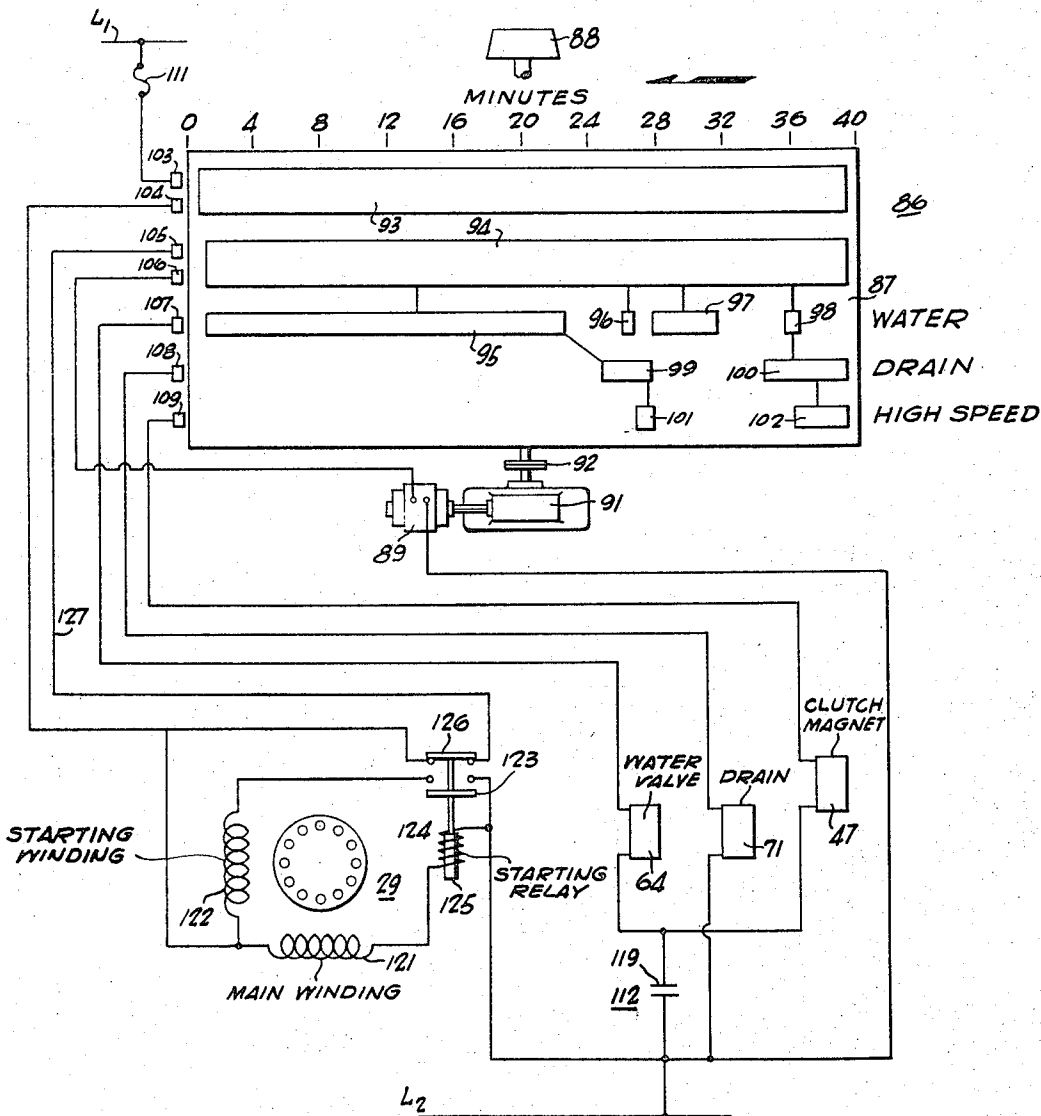


FIG. 6.

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2,313,984

CLEANING APPARATUS

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Application April 25, 1941, Serial No. 390,290

8 Claims. (Cl. 68—23)

Our invention relates to cleaning apparatus and has for an object to provide improved apparatus of this kind.

A further object of the invention is to provide improved apparatus for cleaning fabrics or the like in a cleaning fluid and subsequently extracting cleaning fluid from the fabrics, said operations being effected in a single container movable about a substantially vertical axis.

Further objects of the invention are to reduce vibrations excited in a machine of the type set forth and to reduce substantially the alternating forces imparted to the fixed support of the machine.

A still further object of the invention is to reduce the load on the driving motor of a washing and spinning machine during periods of acceleration to the spinning speed.

Another object of the invention is to reduce the current demands for such apparatus during starting of the driving motor.

It is a still further object of the invention to provide an improved automatically controlled machine for washing and spinning fabrics having a plurality of electrically-operated devices sequentially energized by a timer in which the electrically-operated devices are deenergized during starting periods of the motor or when the current demands of the motor are above a predetermined high value.

These and other objects are effected by our invention as will be apparent from the following description and claims taken in connection with the accompanying drawings, forming a part of this application, in which:

Fig. 1 is a vertical sectional view of a machine for cleaning and centrifuging fabrics and constructed and arranged in accordance with the invention;

Fig. 2 is a sectional view taken along the line II—II of Fig. 1;

Fig. 3 is a sectional view looking upwardly from the line III—III of Fig. 1;

Figs. 4 and 5 are sectional views taken along the respective lines IV—IV and V—V of Fig. 3; and

Fig. 6 is a diagram of the electrical connections for the electrically-operated devices employed in the apparatus.

Reference will now be had to Figs. 1 to 5 of the drawings wherein we have shown our invention applied to a domestic washing and spinning machine of the vertical axis type, although, in this connection, it will be understood that certain features of the invention may be applied

equally well to other forms of washing and spinning machines. The apparatus includes a fluid-containing tub 10, generally cylindrical in configuration and having its axis arranged substantially vertical. Arranged within the tub 10 is a cylindrical basket 11, the side walls of which are perforate as shown at 12. The upper ends of the tub 10 and basket 11 are open for the ingress and egress of the fabrics to be treated and a suitable gasketed and removable cover 13 is provided for the open end of the tub 10.

An agitator 14 is centrally disposed within the basket 11 and may be secured to the basket 11 as shown at 15, so that the agitator 14 moves with the basket 11 at all times. It will be understood that this construction is shown by way of example and that the invention may be applied to machines wherein the agitator may be moved relative the basket. Movement of the agitator 14 in the basket 11 about a substantially vertical axis is effected by a shaft 16 having a squared upper end 17 which is keyed to a central hub portion 18 of the agitator 14. A vertical sleeve or column 19 which is fixed to the tub 10 stands within the hub 18 and provides a suitable bearing 21 for the upper end of the shaft 16, the bearing 21 being preferably disposed above the surface of the cleaning fluid when the tub 10 is loaded. An anti-friction bearing 22 journals an intermediate portion of the shaft 16 within a lower portion of the column 19 and adjacent the bottom of the tub 10. A supporting plate or frame 23 is secured in any well-known manner to the bottom of the tub 10 and defines a support for the tub.

The basket 11 and the agitator 14 are oscillated at a relatively low frequency during cleaning periods and are rotated at a relatively high speed during fluid extracting periods by a two-speed mechanism, generally indicated by the numeral 24 and supported from the plate-like frame 23. The two-speed mechanism 24 includes a housing 25 for enclosing the gearing and clutching mechanism which effects the oscillation and rotation of the basket 11 and agitator 14. The driving mechanism is arranged within the housing 25 and includes a main drive shaft 26 which carries a worm 27 and a pinion 28 axially spaced from each other. A motor 29 is carried by a bracket 31 exteriorly of the housing 25 and drives the shaft 26 at substantially constant speed during all periods of operation. Bearings 32 carried on opposite sides of the housing 25 provide journals for the driving shaft 26.

Rotation of the agitator 14 and basket 11 is

effected during spinning periods by a spiral gear 33 which meshes with the pinion 28 and which is journaled on the lower end of the vertical shaft 16 so that it may rotate relative thereto. Oscillating movement is imparted to the shaft 16 by a member 34 also carried by the shaft 16 so that it may move relative thereabout. The member 34 is oscillated by a connecting rod 35 pivoted at one end to the oscillating member 34 and at its other end to a crank 36 which is rotated by a wormwheel 37, the latter meshing with the worm 27. The wormwheel 37 and crank 36 are journaled on a pin 38 which is secured to the housing 25 and which extends upwardly there-within.

Selective oscillation or rotation of the shaft 16 is controlled by a movable clutching member 39 keyed as shown at 41 to the shaft 16 and movable between upper and lower clutching positions wherein it engages, respectively, the oscillating member 34 and the rotating gear 33. As shown in Fig. 1, the clutching member 39 is in its upper position so that oscillation of the agitator and basket by the member 34 is effected. Axial movement of the movable clutching member 39 along the key 41 is effected by a forked arm 42 one end of which is fitted within an annular groove 43 arranged in a mid portion of the clutching member 39. The movable arm 42 is fixed to a rocker shaft 44 journaled in the housing 25 and extending exteriorly thereof, the outer end of the rocker shaft 44 being provided with an arm 45. A spring 46 biases the forked arm 42 upwardly so that the oscillating member 34 is engaged with the clutching member 39. The clutching member 39 is moved downwardly into engagement with the rotating gear 33 by means of an electro-magnet 47, the movable armature 48 of which is connected to the arm 45 as clearly shown in Fig. 1. It will be understood that, as the electro-magnet 47 is energized, movement of the armature 48 swings the rocker shaft clockwise from the position shown in Fig. 1 and, therefore, the clutching member 39 is moved downwardly along the key 41.

As best shown in Fig. 1, the rotatable spiral gear 33 includes a hub portion 51 which extends downwardly through the bottom wall of the housing 25 in which it is supported by an anti-friction bearing 52. For purposes to be referred to more in detail hereinafter, a flywheel or rotatable inertia stabilizer 53 is carried by the hub portion 51, and, preferably, so that it may rotate relative to the hub portion 51 under certain operating conditions. To this end, a clutch generally indicated at 54 is interposed between the stabilizer 53 and the rotatable hub portion 51. The clutch 54 includes a rotating clutch plate 55 which is keyed to a squared portion 56 of the hub 51 so that it rotates at all times with the hub 51. The clutching plate 55 engages a clutching surface 57 formed on the stabilizer 53 and is maintained in engagement with such clutching surface by a relatively heavy spring 58. The latter engages the clutch plate 55 and forces the same upwardly into engagement with the clutching surface 57 on the stabilizer 53. Upward axial movement of the stabilizer 53 on the hub 51 is prevented by a shoulder 51a formed on the hub 51. An adjusting nut 59 threaded on the lower end of the hub 51 maintains the spring 58 in engagement with the clutch plate 55 and the bias of the spring 58 may be varied by threading or unthreading the nut 59 on the hub 51.

From the foregoing, it will be apparent that,

as the shaft 26 is rotated by the motor 29, the member 34 is oscillated about the axis of the shaft 16 and the spiral gear 33 is rotated thereabout. Movement of the shaft 16 is determined by the position of the clutching member 39 so that, when the clutching member 39 is in the position shown, the shaft 16 is oscillated by the member 34. At this time, the gear 33 and stabilizer 53 are rotated relative to the shaft 16. When the electro-magnet 47 is energized, the clutching member 39 engages the gear 33 so that the shaft 16 is rotated with the gear 33.

During starting periods of the motor, or when the gear 33 and the stabilizer 53 are accelerated, slippage between the gear 33 and the relatively heavy stabilizer 53 is provided by the clutch 54 in order to facilitate starting of the motor. Furthermore, when the clutching member 39 is moved downwardly into engagement with the gear 33 for accelerating the basket to its centrifuging speed, the clutch 54 may slip, as the inertia of the stabilizer is employed to assist the motor in accelerating the basket.

This feature of the invention is highly desirable as in this type of apparatus, the motor is subjected to its heaviest load during the period of acceleration prior to centrifuging. Furthermore, it is desirable that the basket be rapidly accelerated as it usually passes through its critical speed during acceleration. If the basket is accelerated rapidly, the period of dwell in the critical range is short.

Cleaning fluid from a suitable source is admitted to the tub 10 by means of a flexible conduit 61 having a spout portion 62 overhanging the basket 11 so that the fluid discharged to the tub is first directed throughout the interior of the basket 11. The passage of fluid through the conduit 61 is controlled by a valve 63 which is opened and closed by a solenoid 64. As the construction and operation of solenoid operated valves are well understood, no detailed description of the same is deemed necessary other than to state that, the valve is opened when the solenoid 64 is energized, and conversely, when the solenoid is deenergized, the valve is closed. Vitiated water is discharged from the tub 10 through a drain opening 65 which is connected by means of a flexible conduit 66 to the inlet of a pump 67, the latter being carried by the housing 25 and directly driven by the shaft 26. The outlet of the pump 67 is connected by means of a flexible conduit 68 to a suitable point of discharge. Flow of water from the outlet 68 to the pump 67 is controlled by a valve 69 operated by a solenoid 71 in a manner described in connection with valve 63.

The tub 10, multiple speed mechanism 24, the motor 29, and the rotatable stabilizer 53 define major elements of a unitary washing and spinning structure, generally indicated at 70, which is housed within a casing 72. The casing 72 is open at its top as shown at 73 to permit the removal of the cover or lid 13. In accordance with our invention, the unitary washing and spinning structure 70 is resiliently supported within the casing 72 so that vibrations caused by non-uniform distribution of the fabrics in the basket during centrifuging periods are not transmitted to the casing 72 to any objectionable degree. Accordingly, the apparatus may be made portable as shown and may be operated without the necessity of firmly securing the same to a rigid foundation.

The resilient supporting means which we pre-

fer to employ includes a plurality of relatively flat cantilever springs 74, the fixed ends of which are secured to brackets 75 carried by casing 72. The springs 74 are circumferentially spaced relative to the tub 10 and are disposed in a substantially horizontal plane adjacent to but preferably above the center of inertia of the unitary suspended structure 70. The free or movable ends of the springs 74 are secured to respective bosses 76 formed on the under side of the plate-like frame 23. Preferably, the bosses 76 are cupped as shown at 77 to receive embossed domes or projections 78 formed in the ends of the springs 74. A bolt 79 is employed for attachment of the springs 74 to their respective bosses 76.

The springs 74 are disposed about the axis of the suspended structure 70 and generally tangentially with respect thereto. In this position, the springs 74 resist oscillatory translations of the suspended structure generally in horizontal directions, and also oscillatory movements of the structure about its axis. The oscillating forces reacting on the suspended structure during oscillation of the agitator are, therefore, rigidly resisted by the springs 74. However, the springs 74 are very flexible in vertical directions and permit oscillations or precessing of the suspended structure 70 about its center of inertia, the latter being preferably adjacent the axis of the shaft 16 and slightly below a horizontal plane which includes the springs 74.

The stabilizer 53 which, as set forth heretofore, assists the motor in accelerating the basket 11, also stabilizes the suspended structure 70 and resists precessing or vibration of the structure about its center of inertia. Furthermore, advantage is taken of the gyroscopic effect of the stabilizer 53 in resisting such vibrations as it defines a relatively large rotating mass when compared to the total mass of the suspended structure 70.

Such vibratory movements of the suspended structure 70 that occur are damped by dampers, generally indicated at 81, and disposed around the structure 70 remote from the center of inertia thereof. Preferably, the dampers 81 are disposed adjacent the top of the tub 10 and between the tub and casing 72, as in the particular embodiment disclosed this is the region of the suspended structure furthest removed from its center of inertia. These dampers 81 may be any suitable type but are, preferably, of the dry friction type. The dampers include a friction plate 82 secured to the tub in any suitable manner and engaged on opposite sides by spring members 83 which are biased toward each other. Adjustment of the bias of the spring members 83 may be effected by a screw 84 passing through the members 83 in order to vary the damping effect of the dampers 81. The spring friction members 83 are attached to the casing 72 by a resilient support 85 in any well understood manner. Movement of the plate 82 and the suspended structure 70 in general about the center of inertia of the latter is resisted by friction as the plate 82 slides longitudinally between the spring members 83. The resilient support 85 provides for limited vertical movement of the dampers 81 relative to the casing in order to compensate for upward and downward movement of the structure 70 as fluid is admitted to and discharged from the tub 10.

The washing and spinning apparatus described heretofore is particularly adaptable for automatic operation wherein a plurality of steps in a washing and spinning program are carried into

effect without manual attention. To this end, a timer mechanism generally indicated at 86 is employed for energizing and deenergizing the various electrical translating elements employed in the washing and spinning structure. Preferably, the timer mechanism 86 is carried by the casing 72 in a location convenient to the operator.

The electrical connections between the timer mechanism 86 and the various electrical translating devices are shown in Fig. 6 to which reference will now be had. The timer 86 includes an insulating drum 87 shown in development in Fig. 6 and movable at all times in the direction of the arrow. The drum 87 may be rotated manually by a knob 88 and is driven at relatively low speed of, for example, one revolution in 40 minutes by a relatively small synchronous motor of the type commonly employed for driving clocks and indicated at 89. Reduction gearing is diagrammatically indicated at 91 and interposed between the motor 89 and the drum 87 and a slip clutch diagrammatically indicated at 92 is interposed between the reduction gear 91 and the drum 87. The purpose of the clutch 92 is to permit manual movement of the drum 87 relative to the driven element of the reduction gear 91. However, during operation of the motor 89, the reduction gear 91 drives the drum 87 through the clutch 92.

The insulating drum 87 carries a plurality of segments 93 to 102, inclusive, which are engageable with stationary contact fingers 103 to 109, inclusive. The segments 94 to 102, inclusive, are electrically connected but insulated from the segment 93 of the drum 87. The purpose of this arrangement will be more apparent as the description proceeds.

The source of power for the apparatus described heretofore is indicated by the line conductors L₁ and L₂, the former of which is connected through a fuse 111 to the contact finger 103. The contact finger 104 is connected to the electric motor 29 and the contact fingers 107, 108, and 109 are connected, respectively, to one terminal of each of the solenoids 64, 71, and 47. The opposite terminal of the drain solenoid is connected with line conductor L₂ while the opposite terminals of the water valve solenoid 64 and the clutch magnet solenoid 47 are connected to line conductor L₂ through a float switch generally indicated at 112. The purpose of the float switch 112 is to prevent over-filling of the tub and to prevent high speed operation of the basket during periods when water is present in the tub. The float switch structure 112 is shown in Fig. 5 and includes a float chamber 113 which is connected by a conduit 114 to the tub 12 and which is filled and emptied with the tube 12. A float 115 is raised and lowered by the water and engages stops 116 and 117 carried on a switch-actuating rod 118. Any suitable form of switch 119 may be employed, which switch is opened as the float 115 engages the stop 116 and raises the switch-actuating rod 118. Conversely, as the float 115 engages the stop 117, the switch-actuating rod 118 is moved downwardly by the weight of the float and closes the switch 119.

The driving motor 29 which we have shown is of the split phase type and includes a running winding 121 which is energized during all operating periods of the motor and a starting winding 122 energized during starting periods only. This is the form of motor usually employed for driving cleaning machines of the type disclosed herein. Such motors employ a switch automatically

operated in response to the speed, or a characteristic that is a function of the speed, for controlling energization of the starting winding so that it is energized during starting periods and deenergized during running periods as is well understood. The starting switch for the motor 25 is shown at 123 and actuated by a solenoid 124 connected in series with the running winding 121. During starting periods, the high current energizing the running winding and the solenoid 124 closes the switch 123 so that the starting winding 122 is energized. As the speed of the motor increases and the current energizing the running winding 121 and the solenoid 124 is reduced to a predetermined value, the switch 123 is opened for deenergizing the starting winding 122.

The starting current in motors of this type may rise to values many times the normal full load running current particularly if the motor is loaded during starting periods. In the present application, the stabilizer 53 and the agitator 14 load the motor 29 during starting periods so that the starting current thereof is relatively high during acceleration of the stabilizer 53. If the circuits of one or more of the solenoids are closed when the motor 29 is started, the total current drawn from the line may increase to a value sufficient to open the fuse 111. In accordance with our invention, means is provided for deenergizing at least a part of the other electric translating devices employed in the apparatus during starting periods of the main motor 29. As shown in Fig. 6 a second switch 126 is actuated by the solenoid 125 so that it is opened during starting periods and closed during running periods of the motor 29. The switch 126 is connected in a conductor 127 which provides a series connection between the contact segments 104 and 105 of the timer 86. As the contact segments 94 to 102, inclusive, which control energization of the timer motor 89 and the three solenoids 64, 71, and 47 are insulated from the segment 93, the conductor 127 defines a feeder for these segments when the timer is in an active position. In other words, the timer motor 89 or the solenoids 64, 71, and 47 can only be energized when the common conductor or feeder 127 is connected by its switch 126 to the line conductor L₁ through the segment 93 and its contact fingers 103 and 104.

The operation of the electrical system shown in Fig. 6 will now be described. The various electrical elements are shown in the positions which they assume during an inactive position of the washing and spinning apparatus. Operation is initiated by rotating the drum 87 to an active position, for example, the four-minute position shown on the timer. This adjustment engages the segment 93 with the contact fingers 103 and 104 and also effects engagement of the electrically-connected segments 94 and 95 with the fingers 105, 106, and 107. Engagement of the segment 93 with the fingers 103 and 104 energizes the main winding 121 of the motor 29 through a circuit including the line conductor L₁, the fuse 111, the finger 103, the segment 93, the finger 104, main winding 121, the solenoid 124, and the line conductor L₂. The relatively high starting current energizing the solenoid 124 closes the switch 123 and opens the switch 126. Closing of the former energizes the starting winding 122 which is now connected in parallel with the main winding 121 and the solenoid 124. Bridging of the fingers 105, 106, and 107 by the

electrically-connected segments 94 and 95 is of no moment during the starting period as the common feeder 127 is opened by the switch 126 and, therefore, the circuits extending from the fingers 106 and 107 to the timer motor 89 and water valve solenoid 64 remain deenergized. Accordingly, the amount of current drawn from the line conductors L₁ and L₂ at this time is reduced in the amount normally demanded by the timer motor 89 and the water valve solenoid 64.

As the speed of the main motor 29 increases, the current energizing the main winding 121 and the solenoid 124 is progressively reduced to a predetermined value at which the solenoid 124 effects opening of the switch 123 and closing of the switch 126. Opening of the former deenergizes the starting winding 122 and closing of the latter completes the circuit from the line conductor L₁ to the feeder 127 and, therefore, the timer motor and the water valve solenoid 64 are energized. As the specific program of washing, rinsing, and drying steps forms no part of the present invention, it is not deemed necessary to describe in detail the various operations which are completed as the various segments 95 to 102, inclusive, engage and disengage their stationary fingers 107, 108, and 109. It will be apparent that water is admitted to the washer during periods when the segments 95, 96, 97, and 98 engage the finger 107 under control of the float switch 119. Furthermore, when the segments 99 and 100 engage the finger 108, the drain valve solenoid 71 is energized for the discharge of water from the washer. Engagement of the segments 101 and 102 with the finger 109 effects high speed operation of the basket as these segments control energization of the clutch magnet 47. It will be apparent that upon resumption of power after a failure thereof for any reason during cycling of the apparatus, the total amount of current drawn from the line will be only that required for energizing the main motor 29 and that all of the other electrical translating devices will be deenergized during the starting period because of the opening of the switch 126 of the starting relay solenoid 124.

The current control features above described are claimed in a divisional application, Serial Number 454,388, filed August 11, 1942.

It will be apparent from the foregoing description that we have provided improved apparatus for cleaning and centrifuging fabrics or the like wherein vibration of the washing and spinning structure due to uneven distribution of the load therein is minimized by the rotating stabilizer. Advantage is taken of the inertia of the latter to facilitate acceleration of the basket to its centrifuging speed so that the period of dwell in critical speed is reduced to a low value. Furthermore, our improved resilient supporting structure and the vibration damping organization associated therewith reduces to a low value the alternating forces imparted to the rigid support or foundation of the apparatus. The improved control for deenergizing the various electrical translating devices associated with the apparatus during the starting of the main motor reduces the total current demands of the apparatus at this time. This feature of the invention is highly desirable in domestic type machines which are usually operated from low capacity circuits fused at 15 amperes or less by regulation.

While we have shown and described our invention as applied to a vertical axis machine, it will be understood that certain features thereof may

be applied equally well to other types of cleaning and centrifuging machines. Furthermore, the particular type of vertical axis machine which we have shown is disclosed by way of example and it is to be understood that other forms of machines operating about a vertical axis may be employed.

Flat cantilever springs arranged in a substantially horizontal plane are employed for relatively rigidly resisting horizontal translations of the suspended body and oscillations thereof about its vertical axis while permitting free vibratory movement of the body about its center of inertia in vertical planes but it is to be understood that other forms of resilient supporting members may be employed for the recited functions.

While we have shown our invention in but one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various changes and modifications without departing from the spirit thereof, and we desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What we claim is:

1. In apparatus for cleaning fabrics and for centrifuging cleaning fluid therefrom, the combination of a tub for washing fluid, a basket for containing the fabrics to be treated, adjustable driving means for selectively agitating the fabrics within the basket and for rotating the basket at relatively high speed for extracting fluid from the fabrics, said tub, basket and driving means defining a unit structure, means for resiliently supporting the unit structure, and a rotatable inertia stabilizer carried by the unit structure and driven by said driving means during all periods of operation thereof.

2. In apparatus for cleaning fabrics and for centrifuging cleaning fluid therefrom, the combination of a container for cleaning fluid and the fabrics to be treated, means for agitating the fabrics in the cleaning fluid, means for rotating the fabrics at relatively high speed for extracting cleaning fluid therefrom, a motor, a transmission driven by the motor and adjustable to a first position for actuating said agitating means and adjustable to a second position for driving said rotating means, said container, transmission and motor being secured together and defining a unit structure, means for resiliently supporting the unit structure and an inertia stabilizer carried by the unit structure and rotatable at all times with said motor.

3. In apparatus for cleaning fabrics and for centrifuging cleaning fluid therefrom, the combination of a tub for containing cleaning fluid and the fabrics to be treated, said tub having its axis extending substantially vertical, means for agitating the fabrics in the cleaning fluid, means for rotating the fabrics at relatively high speed for extracting cleaning fluid therefrom, a motor, a transmission driven by the motor and adjustable to a first position for actuating said agitating means and to a second position for driving said rotating means, said tub, transmission and motor being secured together and defining a unit structure, a plurality of springs circumferentially spaced with respect to the tub and disposed in a horizontal plane adjacent the center of inertia of said unit structure, means for damping vibratory movements of the unit structure and a rotatable inertia stabilizer carried by the unit

structure and driven by the motor during all periods of operation thereof.

4. In apparatus for cleaning fabrics and for centrifuging cleaning fluid therefrom, the combination of a tub for containing cleaning fluid and the fabrics to be treated, said tub having its axis extending substantially vertical, means for agitating the fabrics in the cleaning fluid, means for rotating the fabrics at relatively high speed for extracting cleaning fluid therefrom, a motor, a transmission driven by the motor and adjustable to a first position for actuating said agitating means and to a second position for driving said rotating means, said tub, transmission and motor being secured together and defining a unit structure, a plurality of members for supporting the unit structure and circumferentially spaced therearound, said members being relatively stiff for resisting movement of the unit structure in a direction tangentially thereof and relatively flexible for permitting movements of the unit structure generally in a vertical direction, said members being arranged substantially in a horizontal plane disposed adjacent to and above the center of inertia of the unit structure, a plurality of dampers for resisting vibrations of the unit structure, said dampers being spaced axially of the unit structure from the supporting members, and a rotatable inertia stabilizer carried by the unit structure and rotated by said motor during all periods of operation thereof.

5. In apparatus for cleaning fabrics and for centrifuging cleaning fluid therefrom, the combination of a tub for containing cleaning fluid, a substantially cylindrical basket for containing the fabrics to be treated and having its axis disposed substantially vertical, means for agitating the fabrics within said basket, means for rotating the basket about its axis for extracting fluid from the fabrics, said tub and rotating means being constructed as a unit, means including a plurality of leaf springs circumferentially spaced around the tub for resiliently supporting said unit, said springs being arranged generally tangentially with respect to the tub in a substantially horizontal plane adjacent the center of inertia of said unit, and a plurality of dampers for retarding vibration of said unit and circumferentially spaced in a substantially horizontal plane remote from the plane of said springs.

6. In apparatus for cleaning fabrics and for centrifuging cleaning fluid therefrom, the combination of a casing, a tub for containing cleaning fluid and arranged within the casing, a basket for containing the fabrics to be treated and disposed within the tub, said tub and basket having their axis disposed substantially vertical, means for agitating the fabrics within the basket, means for rotating the basket about its axis for extracting cleaning fluid from the fabrics, said tub, basket and rotating means defining a unit structure, a plurality of leaf springs circumferentially spaced around the tub for resiliently supporting said unit structure from the casing, said springs being arranged generally tangentially with respect to the tub and in a substantially horizontal plane adjacent the center of inertia of the unit structure, and a plurality of dampers for retarding vibration of the unit structure and circumferentially spaced in a horizontal plane remote from the plane of said springs, said dampers including relatively movable friction members respectively carried by the unit structure and the casing and adjustable means for varying the friction between said members.

7. In apparatus for cleaning fabrics and for centrifuging cleaning fluid therefrom, the combination of a substantially cylindrical tub for containing cleaning fluid and the fabrics to be cleaned, said tub having its axis arranged substantially vertical, means disposed within the tub for agitating the fabrics, means arranged within the tub for rotating the fabrics, a motor, a two-speed mechanism carried by the tub and driven by the motor, adjustable means for selectively connecting the two-speed mechanism to the agitating means and said rotating means, a rotatable inertia stabilizer driven by the motor during all periods of operation thereof, said tub, motor and two-speed mechanism defining a unit structure, a plurality of cantilever leaf springs circumferentially spaced around said unit structure and disposed substantially tangentially with respect to the tub, a support for carrying one end of each of said springs, the opposite ends of the springs engaging the unit structure for the support thereof and a plurality of dampers circum-

ferentially spaced around the unit structure for retarding vibratory movement thereof, said dampers being disposed in a horizontal plane spaced from the center of inertia of the unit structure.

8. In apparatus for cleaning fabrics and for centrifuging cleaning fluid therefrom, the combination of a container for cleaning fluid and the fabrics to be treated, means for agitating the fabrics in the cleaning fluid, means for rotating the fabrics at relatively high speed for extracting cleaning fluid therefrom, adjustable driving means for selectively actuating said agitating means and said rotating means, said container and said driving means being secured together and defining a unit structure, means for resiliently supporting the unit structure and an inertia stabilizer carried by the unit structure and rotated by said driving means during all periods of operation thereof.

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