

Sept. 22, 1942.

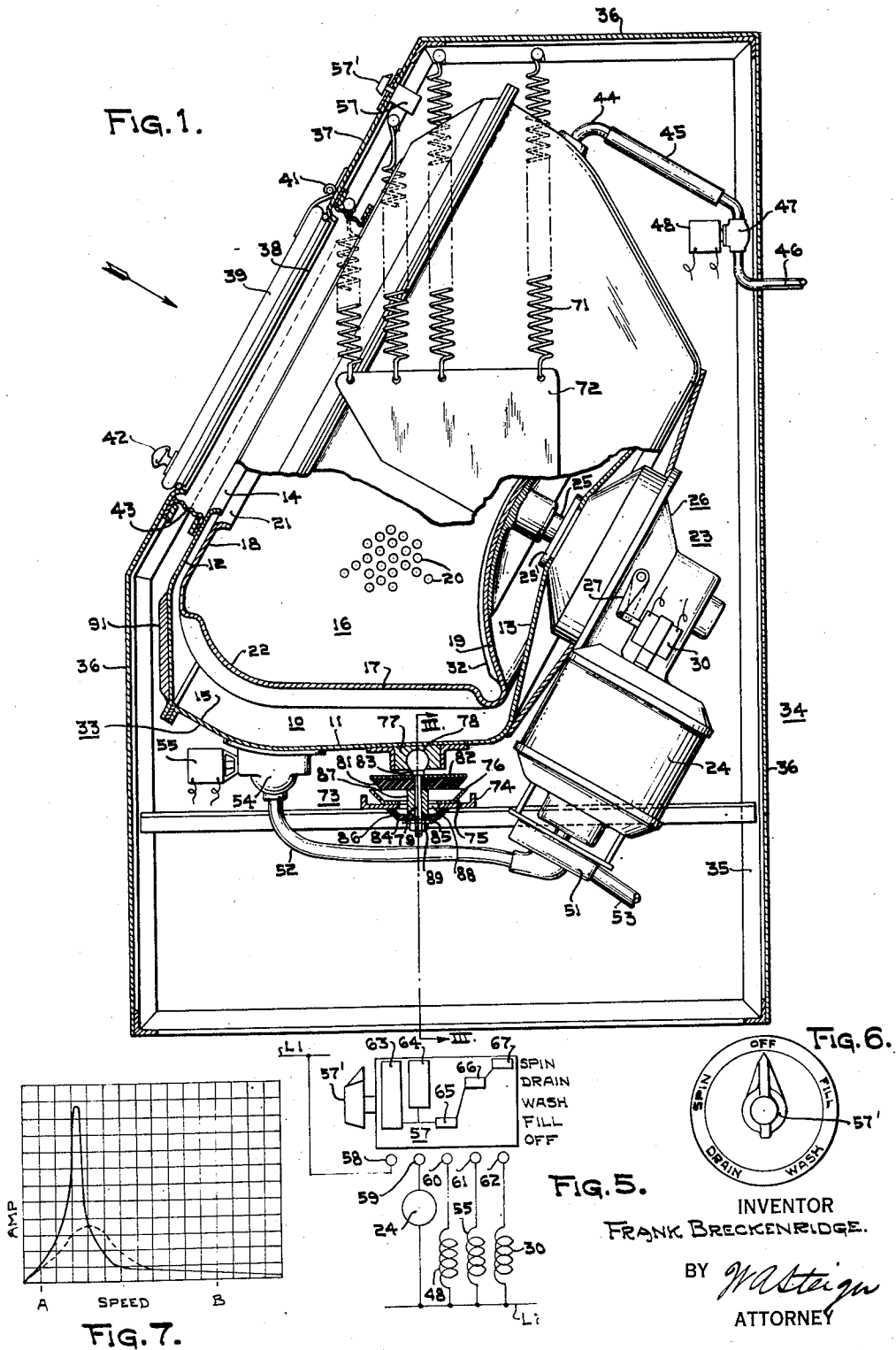
F. BRECKENRIDGE

2,296,260

APPARATUS FOR WASHING FABRICS OR THE LIKE

Filed Aug. 26, 1938

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

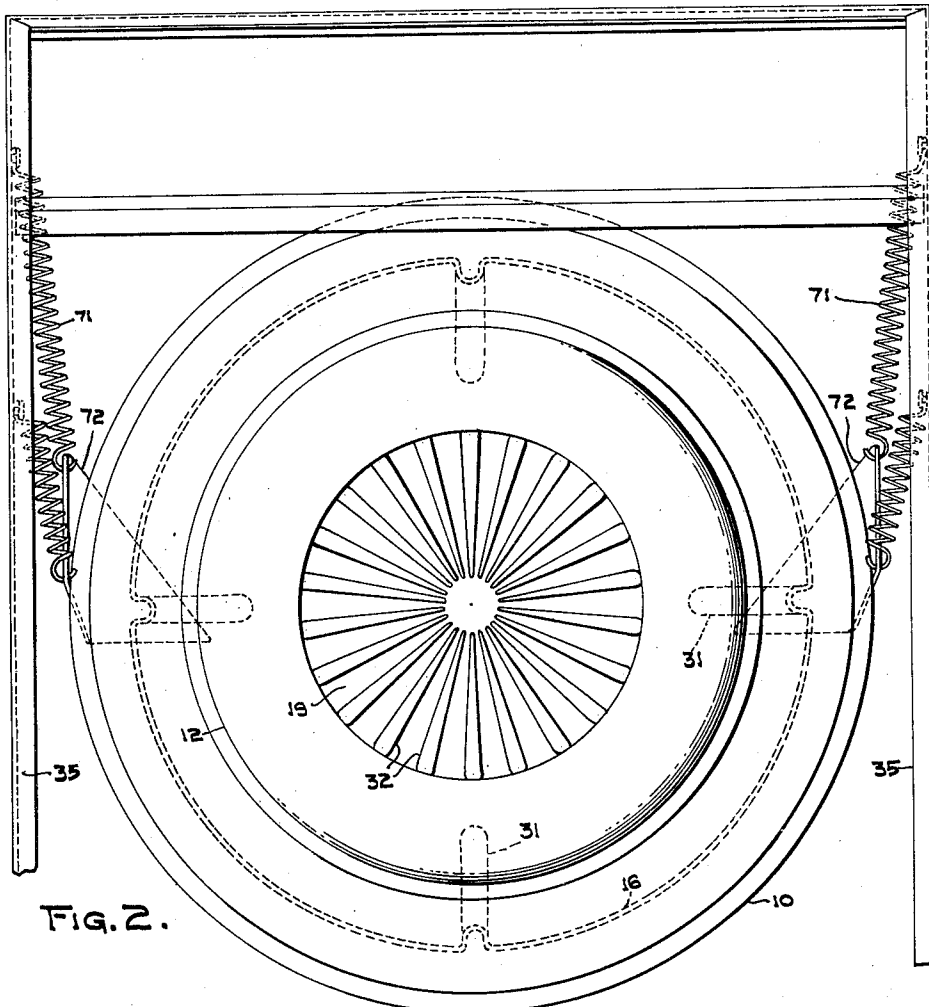


FIG. 2.

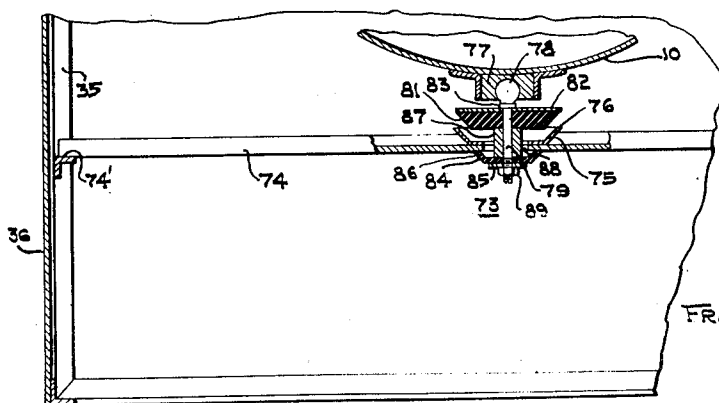


FIG. 3.

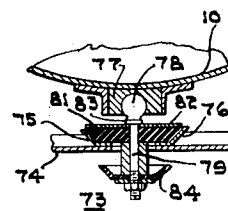


FIG. 4.

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2,296,260

APPARATUS FOR WASHING FABRICS OR
THE LIKE

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Application August 26, 1938, Serial No. 226,853

16 Claims. (Cl. 68—24)

My invention relates to apparatus for washing fabrics or the like and for centrifugally extracting fluid therefrom. An object of the invention is to provide improved apparatus of this kind.

A further object of the invention is to provide a machine of the character set forth that will operate with a minimum of vibration so that it may be constructed as a portable machine and operated without being secured to the laundry floor.

A further object of the invention is to provide improved means for flexibly supporting a washing unit so as to reduce to a minimum vibrations originating in the unit which are transmitted to the casing or supporting structure for the unit.

Another object of the invention is to provide an improved washing and fluid extracting machine that may be operated at higher speeds than have been employed heretofore so that the duration of the extracting period is substantially reduced.

A further object of the invention is to resiliently support a washing and fluid extracting mechanism during high speed fluid extracting periods of operation and to restrain said mechanism against oscillatory movement during slow speed washing periods.

These and other objects are effected by my 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 washing machine constructed and arranged in accordance with my invention and having portions thereof broken away for the sake of clearness;

Fig. 2 is a view, looking in the direction of the arrow shown in Fig. 1, and illustrates the frame and flexibly supported water containing structure;

Fig. 3 is a sectional view taken along the lines III—III of Fig. 1;

Fig. 4 is a view of a detail shown in Figs. 1 and 3 and in a different operating position;

Fig. 5 is a diagram of the electrical apparatus forming a part of the washer construction;

Fig. 6 is a front view of the control switch index plate; and

Fig. 7 is a curve referred to in the following description.

Reference will now be had to the drawings wherein I have disclosed my invention applied to a domestic washer of the type generally shown and claimed in my copending application Serial

No. 203,804, filed April 23, 1938, and assigned to the assignee of the present application. It will be understood that my invention may be applied equally well to other forms of washing and spinning machines and that the particular type of machine shown in the present application is disclosed by way of example.

Reference will now be had to Figs. 1 to 4, inclusive, for a description of the construction of the washing and spinning apparatus. The washer includes a tub or water containing structure 10 of substantially frusto-conical configuration and including side walls 11 and walls 12 and 13 at its large and small ends, respectively. An access opening 14 is provided in the large end wall 12 at the center thereof and the side walls 11 are curved inwardly where it joins the end walls 12 as shown at 15.

Disposed within the tub structure 10 is a perforate rotatable basket generally indicated at 16 and substantially of frusto-conical formation. The basket 16 includes a side wall 17 and end walls 18 and 19 at its large and small ends, respectively. The end wall 18 is formed with an access opening 21 aligned coaxially with the opening 14 in the tub structure 10. The portion 22 of the side wall 17 that is opposite the curved portion 15 of the tub structure 11 is curved as shown so that the inner surface of the basket 16 is defined by well rounded surfaces. A plurality of perforations formed in the basket 16 are shown at 20. It will be understood that substantially the entire side wall 17 and the curved portion 22 thereof are perforate. The end wall 19 is curved inwardly for defining a dome within the basket 16, as shown.

The axis of the tub 10 and basket 16 is preferably inclined whereby the access opening 14 is rendered more accessible to the operator for loading and unloading the basket. Furthermore, the inclined basket 16 provides for more even distribution of the fabrics in the basket 16 when the spinning or water extracting operation is initiated.

Rotation of the basket 16 in a single direction at relatively low speed during the washing cycle and at relatively high speed during the spinning or extracting cycle is provided by a drive mechanism 23, preferably carried by the tub structure 10 adjacent the end wall 13 thereof. The drive mechanism 23 includes an electric motor 24 that rotates a shaft 25 of the basket 16 through a speed reducing mechanism, generally indicated by the numeral 26. The shaft 25 is journaled in a suitable bearing 25' carried by the end wall 13

and preferably forming an element of the mechanism 26. As the specific form of speed reducing mechanism 26 that is employed forms no part of the present invention, it has not been shown in detail for the sake of brevity. The mechanism 26 includes suitable gearing (not shown) between the motor 23 and the shaft 25 so that the latter may be driven at relatively high and low speeds. The mechanism 26 may be adjusted by an arm 27 for selecting the speeds at which the shaft 25 operates. It will be assumed that the shaft 25 is rotated at relatively low speed for washing when the arm 27 is in the position shown and that the shaft 25 rotates at high speed for spinning when the arm 27 is adjusted to the position shown in broken lines. The arm 27 is adjusted to its high speed position, or to the position shown in broken lines, by means of an electro-magnet 30 when energized. Further reference to the control of energization of the magnet 30 will be made hereinafter.

In my copending application, Serial No. 305,512, filed November 21, 1939, and assigned to the assignee of the present application, there is disclosed and claimed a speed-reducing mechanism of the type shown at 26 in combination with a diverging tub structure generally of the type shown at 10 in the present application.

Agitation of the fabrics in the washing fluid contained in the tub 10 is effected by a plurality of inwardly extending ribs or vanes 31 that are circumferentially spaced within the basket 16. As the basket 16 is rotated the fabrics are engaged by the vanes and are agitated in the washing fluid; the fabrics being moved toward the dome 19 due to the inclination of the vanes 31 as they are moved upwardly. The fabrics adjacent the dome 19 are lifted from the fluid and then dropped from an upper region of the basket upon the dome 19 over which they slide as they are returned by gravity to the fluid. The dome 19 is ribbed as shown at 32 for providing a scrubbing surface for the fabrics and for strengthening the dome. It will be understood that other means may be employed for cleansing or agitating the fabrics and that the specific means disclosed herein is shown by way of example.

It will be apparent from the foregoing description that the tub 10, basket 16 and the drive mechanism 23 therefor define a unitary washing and spinning construction, generally indicated by the numeral 33. A casing structure 34 encloses the washing unit 33 and defines the support therefor.

The casing structure 34 includes a frame 35 preferably formed of angle iron and having finishing side panels 36 secured thereto. The portion 37 of the front of the casing is inclined as shown and provided with an access opening 38 aligned with the openings 14 and 21, said opening 38 being provided with a suitable closure 39. The closure 39 is hinged to the casing 34 as shown at 41 and is provided with an operating handle 42. The closure 39 is preferably gasketed for preventing leakage of water through the opening 38. An annular seal or bellows 43 may be provided for closing the space between the tub wall 12 and the portion 37 of the casing while permitting movement of the tub 10 relative to the casing 34. The bellows 43 is formed of flexible material such as, for example, rubber and is fixed at its ends to the tub 10 and casing structure 34 in any well-known manner.

Water is admitted to the tub 10 through an

inlet conduit fitting 44 that is connected by a flexible conduit 45 to a conduit 46 secured to the casing 34. The conduit 46 is connected to suitable sources of hot and cold water, the flow of water to the tub 10 being controlled by a valve 47. As shown, an electrically-operated valve is employed and includes a solenoid 48 which, when energized opens the valve 47 and when deenergized closes the same. As the construction and operation of electrically-operated valves of the type shown are well understood, further description of the same is deemed unnecessary. The flexible conduit 45 provides for relative movement between the tub 10 and casing 34, further reference to which is made hereinafter.

Fluid is translated from the tub 10 in any suitable manner such as, for example, by means of a pump 51 that is driven by the motor 24. Water is conveyed from the tub 10 to the inlet of the pump 51 by a conduit 52 and an outlet conduit 53 conveys the fluid translated by the pump to a suitable point of discharge. A flexible conduit such as, a length of hose, (not shown) may be employed for conveying the fluid discharged from the pump 51. The flow of fluid from the tub 10 to the conduit 52 may be controlled by a valve 54 that is operated by a solenoid 55 which when energized opens the valve 54, and when deenergized effects closure of the same. The solenoid-operated valve 54 may be of the same general type as the valve 47 referred to heretofore.

Operation of the washing apparatus described heretofore may be effected manually or automatically. As shown, the various electrical elements including the motor 24, the speed changing magnet 30 and the valve solenoids 48 and 55 are manually controlled by a switch 57 carried by the front panel 37 and having an operating handle 57'. The electrical connections between the switch and the elements controlled thereby are shown in Fig. 5. The switch structure 57 includes a plurality of stationary contact finger 58 to 62, inclusive, and a plurality of electrically connected movable contact segments 63 to 61 inclusive, cooperating with the respective contact fingers. The contact finger 58 is connected to a line conductor L₁ and the contact fingers 59, 60, 61 and 62 are connected to terminals of the motor 24, the solenoid 48, the solenoid 55 and the speed changing magnet 30, respectively. The opposite terminals of the motor 24, the solenoids 48 and 55 and the magnet 30 are connected to a second line conductor L₂.

The switch 57 may be a five-position switch, the various positions being designated as "Off," "Fill," "Wash," "Drain" and "Spin." As shown in Figs. 5 and 6, the switch is in its "off" position so that the washer is inactive. Upon movement to the "fill" position, the solenoid 48 is energized by a circuit including the contact finger 58, the electrically connected segments 63 and 65 and the contact 60. At this time water is admitted to the tub 10 and the fabrics and a detergent may be placed in the basket 16. When sufficient water is admitted to the tub, the switch 57 is turned to the "wash" position wherein the motor 24 is energized by a circuit including the contact 58, the segments 63 and 64 and the contact 59. Agitation of the fabrics in the washing fluid is effected at this time as described heretofore, and when the washing operation is completed, the switch 57 is turned to its "drain" position. Accordingly, the fluid is discharged from the tub 10 by means of the pump 51 as the valve

54 is opened by the solenoid 55, the latter being energized by a circuit including the contact 58, the segments 63 and 66 and the contact finger 61.

After the washing fluid has been drained from the tub 10, the switch 57 is turned to the "spin" position, at which time the speed changing magnet 36 is energized and the arm 27 moved to the position shown in dotted lines wherein high speed operation of the basket 16 is effected. The circuit for the magnet 30 includes the contact 58, the segments 63 and 67 and the contact 62. A substantial portion of the washing fluid present in the fabrics is centrifugally discharged therefrom and is removed from the tub 10 by the pump 51.

After the spinning operation is completed, the switch 57 is adjusted to its "off" position wherein the motor 24, the valve solenoids 48 and 55 and the magnet winding 30 are deenergized so that the washer is rendered inactive.

The operation described relates to washing of the fabrics and the rinsing operation is similar except that no detergent is placed in the tub. However, the switch 57 is actuated as described heretofore to its various positions for agitating the fabrics in the rinse water, for draining the water from the tub and for spinning the rinse water from the fabrics.

In accordance with my invention, improved means are provided for supporting the tub 10 within the casing 34. The support of the tub 10 is such that, during high speed operating periods of the basket 16, the tub 10 is relatively flexibly supported and, during low speed operation or periods when washing is effected, the tub 10 is supported in part directly by the casing or is relatively rigidly supported. As shown, the support includes a group of tension springs 71 located on each side of the tub. The springs are suspended from the casing structure 34 in any suitable manner and carry support plates 72 that are secured to the tub 10 intermediate its ends. In the present embodiment, I have shown four springs in each group (see Fig. 1). In Fig. 2, I have shown only the end springs of each group, the two center springs of the groups being omitted for the sake of clearness.

A steadying supporting device 73 is associated with a bottom portion of the tub 10 and the casing 34. As shown in Figs. 1 and 3, it comprises a channel iron 74 secured to the casing frame 35 at its ends 74'. The channel iron 74 carries a cup-shaped member 75 having upwardly extending side walls 76. The portion of the device 73 that is secured to the tub 10 includes a ball 78 and socket mechanism 77, the socket 77 being secured to the tub in any suitable manner and the ball 78 being housed in the socket and carrying a tension stud 79. A pad 81, preferably of resilient material such as rubber, is carried by the stud 79 and provided with a stiff backing plate 82 that engages a shoulder 83 on the stud 79. A resilient compression member 84 backed by a washer 85 is also carried by the stud 79 and preferably includes an annular upstanding rib 86 that engages the under side of the channel iron 74 in the position of the apparatus shown in Figs. 1 and 3. The resilient pad 81 and the resilient compression member 84 are spaced by a collar 87 that extends through an opening 88 formed in the channel 74 and cup-shaped member 75. A nut 89 threaded on the stud 79 and engaging the backing washer 85 secures the pad 81, the member 84 and the spacer 87 together.

During operation of the washing apparatus, the basket 16 is subject to vibration due to any unbalance thereof, caused by, for example, uneven distribution of fabrics therein. The amplitudes of the vibrations for different basket speeds are indicated by the solid line curve (Fig. 7) for a washer of the type described heretofore. The washing speed employed is approximately 50 R. P. M. and the extracting speed, approximately 600 R. P. M. The critical speed for a washer of this type is approximately 165 R. P. M. as shown by the peak of the curve, at which speed the amplitude of the vibrations is maximum. I consider it important to so construct and arrange the rotating element of the apparatus that the critical speed is of much lower frequency than the relatively high extracting speed.

In order to reduce the amplitude of vibration at critical speed, I provide inertia stabilizing means of suitable mass and preferably defined by a relatively heavy annulus 91 fixedly secured to the end wall 12 of the tub structure 10. The effectiveness of the stabilizer 91 in damping vibrations is increased as the distance between the stabilizer and the point of application of the vibrating forces is increased. In the present construction, the vibrating forces are applied to the tub through the shaft 25, its journal 25' and the end wall 13. Preferably, the stabilizer 91 is spaced axially from the wall 13 where its effectiveness is optimum but it will be understood that the stabilizer may be spaced from the wall 13 otherwise than in an axial direction. The mass of the stabilizer 91 may be determined for any specific application from the maximum expected unbalance of the rotating mass, the speed thereof and the allowable amplitude of vibration.

The dotted line curve in Fig. 7 indicates the amplitude of vibration for different speeds when the washer construction described heretofore is provided with the inertia stabilizer 91 as disclosed. It will be apparent that the amplitude of the vibrations at critical speed are substantially reduced. The effectiveness of the stabilizer 91 is maximum at critical speed as shown by the curve. However, it is effective at other speeds and particularly at the high extracting speeds B in damping vibrations originating in the rotating elements of the washer.

The bias of the springs 71 is such that, during periods when the tub 10 is substantially devoid of water other than that which may be held by the fabrics, the tub 10 is maintained in an elevated position, that is, the position shown in Figs. 1 and 3, and the flange 86 of the resilient member 84 is engaged with the bottom side of the channel 74 so as to afford some snubbing action. The tub 10 is, therefore, relatively flexibly supported by the casing 34. At this time, the basket 16 is rotated at relatively high speed for centrifugally extracting fluid from the fabrics. From the foregoing description it will be apparent that vibrations of the tub 10 relative to the casing are permitted by the springs 71 and the resilient member 84 but such vibrations, being dampened by the latter member, they are not transmitted to the casing 34 to any objectionable degree. Limited movement of the tub 10 in every direction is permitted by the springs 71 and the resilient member 84. Some movement of the bottom portion of the tub in horizontal directions is permitted by the ball and socket connection between the member 84 and the tub 10, said member 84 bending or flexing as the ball 78 and stud 79 are moved horizontally. As the casing 34 is sub-

stantially free of vibration, the apparatus may be constructed as a portable device and need not be secured to a foundation. Furthermore, when employed as an automatically cycled machine, the timer mechanism which is usually of delicate construction and affected by vibration may be secured to the casing 34 without any precautions taken for flexibly mounting the same.

When operating at slow speed or during washing periods, I have found that it is desirable to support the tub in a more rigid manner. Otherwise, bouncing of the tub 10 may be experienced at this time, it being understood that the effectiveness of the inertia stabilizer 91 is reduced when the speed of the basket 16 and the frequency of vibration thereof is reduced. During slow speed or washing periods of the apparatus, the weight of the water in the tub 10 is employed for lowering the tub 10 in opposition to the springs 71 until the resilient pad 81 seats in the cup-shaped member 75. The side of the pad 81 is engaged by the walls 76, as shown in Fig. 4, so that a relatively rigid support for the tub 10 is provided at this time whereby, a portion of the weight of the tub 10 and load therein is carried directly by the channel member 74. Some movement of the tub 10 is provided by the flexibility of the pad 81 and ball and socket connection 77-78, but it is relatively small. It will, of course, be understood that the resilient member 84 is moved out of engagement with the channel 74 at this time.

From the foregoing description it will be apparent that I have provided an improved machine for washing and drying fabrics centrifugally, wherein vibration is substantially reduced at normal operating speeds and during critical speed so that operation at high speed for extracting fluid from the fabrics is permitted. Accordingly, the duration of the drying period is substantially reduced by the high extracting speed which may be effected. Furthermore, the improved means for flexibly supporting the washing mechanism at one time and relatively rigidly supporting the same by the casing at another time reduces vibrations imparted to the casing to a minimum so that securing of the casing to the laundry floor is obviated and construction of the apparatus as a portable machine is permitted.

My invention is particularly applicable to washing machines of various types operating automatically for effecting a predetermined program of steps in a washing cycle, as badly unbalanced loads are encountered in automatic machines because of the automatic transition from the washing to the fluid extracting steps in the cycle.

While I have shown my 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 I desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What I claim is:

1. In laundry apparatus, the combination of a container for washing clothes, means for actuating the container at different speeds so as to effect washing and drying operations, means for resiliently suspending the container and means for damping vibratory movements of the container, said damping means being more effective to damp vibrations of the container during washing periods than during drying periods.

2. In laundry apparatus, the combination of a container for water and clothes, resilient means for supporting the container to afford vibratory movements thereof in both an upper position for drying the clothes and a relatively lower position for washing the clothes, and means rendered active in response to movement of the container to its lower position for damping vibratory movements of the container.

3. In laundry apparatus, the combination of a rotatable container for water and clothes, said container having its axis of rotation substantially inclined from the vertical, means for rotating the container at different speeds so as to effect successive washing and drying actions, said rotating means and said container forming a unitary structure, means for flexibly and movably supporting said unitary structure during the washing action and for flexibly and movably supporting said unitary structure during the drying action and means for damping vibrations of the unitary structure during washing periods so that said supporting means is less flexible and movable during the washing action than during the drying action.

4. In laundry apparatus, the combination of a tub, a rotatable basket disposed in the tub, means carried by the tub for rotating the basket at relatively high speed for extracting fluid from the fabrics contained therein, said tub, basket and rotating means defining a unitary structure means for resiliently supporting the unitary structure and inertia stabilizing means rigidly secured to the tub and movable therewith as a unit provided on the tub.

5. In laundry apparatus, the combination of a tub, a basket disposed within the tub, a shaft for rotating the basket and journaled in a portion of the tub, an inertia stabilizer carried by the tub and spaced so generally in an axial direction from said portion of the tub that the basket is disposed at least in part in a region intermediate said tub portion and the inertia stabilizer, and flexible means for supporting the tub.

6. In apparatus for washing fabrics and for centrifugally extracting fluid therefrom, the combination of a supporting structure, a container for washing fluid and clothes, flexible means for movably supporting the container from said structure in both an elevated position and a lower position, said flexible means affording downward movement of the container to said lower position as fluid is admitted to the container, additional flexible means rendered active for assisting the first-mentioned supporting means in supporting the container and for resisting vibratory movements of the container when the latter is in its lower position, said additional flexible means being rendered substantially inactive when the container is disposed in its elevated position, means for rotating the fabrics in the washing fluid at relatively low frequency for washing the fabrics during periods when the container is in its lower position and means for rotating the fabrics within the container at relatively high frequency during periods when the container is in its elevated position.

7. In apparatus for washing fabrics and for extracting fluid therefrom, the combination of a casing structure, a tub for containing fluid, a basket for containing the fabrics to be washed rotatably carried within the tub, resilient means for flexibly and movably supporting the tub from the casing structure during both washing and fluid extracting periods, said resilient means af-

fording downward movement of the tub when fluid is admitted thereto, vibration damping means interposed between the tub and the casing structure for limiting downward movement of the tub said damping means being rendered active in response to the admission of a predetermined weight of fluid to the tub, and means for rotating the basket at relatively low speed when the tub contains said predetermined weight of fluid and at relatively high speed when the tub is substantially devoid of fluid.

8. In apparatus for washing fabrics and for extracting fluid therefrom, the combination of a casing structure, a tub for containing fluid, a basket for containing the fabrics to be washed rotatably carried within the tub, a plurality of springs for suspending the tub from the casing structure, a socket member carried by the tub, a stud having a spherical head housed in said socket member, a resilient member carried by said stud and engaging a portion of the casing structure for resisting upward movement of the tub during periods when it is substantially devoid of fluid, a resilient pad carried by the stud, seating means carried by the casing structure for receiving and supporting said pad during periods when a predetermined weight of fluid is present in the tub, and means for rotating the basket at relatively low speed when the tub contains said predetermined weight of fluid and at relatively high speed when the tub is substantially devoid of fluid.

9. In a laundry machine, the combination of a tub for washing fluid, a basket rotatably supported within the tub, driving means for rotating the basket at relatively low speed for washing the fabrics in the fluid and at relatively high speed for extracting fluid from the fabrics, said tub, basket and driving means being constructed to define a unitary structure and said basket having its axis of rotation angularly disposed with respect to the vertical, resilient means for movably supporting said unitary structure during both washing and fluid-extracting periods and resilient means relatively inactive during the fluid-extracting periods and relatively active during the washing periods for assisting said resilient supporting means in movably supporting the unitary structure, said last-mentioned supporting means including means for damping vibratory movement of the unitary structure.

10. In a laundry machine, the combination of a tub for washing fluid, a basket rotatably supported within the tub about an axis disposed at an angle to the vertical and extending generally in a horizontal direction, means carried by a portion of said tub for rotating the basket at relatively low speed for effecting washing of the fabrics and at relatively high speed for extracting fluid from the fabrics, said tub, basket and driving means being constructed to define a unitary structure, inertia stabilizing means carried by the tub and spaced substantially from the portion thereof which supports the driving means, means for resiliently supporting said unitary structure, said supporting means being attached to the container in a region intermediate said driving means and inertia stabilizer, and means relatively inactive during the fluid-extracting periods and relatively active during the washing periods for resisting vibratory movement of the unitary structure, said last-mentioned means being associated with the region of the unitary structure intermediate the inertia stabilizing means and the driving means.

11. In a machine for cleaning fabrics and for spinning the same for the extraction of cleaning fluid, the combination of a container for the fabrics and a body of cleaning fluid, means for actuating the container at relatively low speed with fluid therein for cleaning the fabrics and for rotating the container at relatively high speed in the absence of the body of fluid for spinning fluid from the fabrics, means for resiliently supporting the container in an elevated position during periods when it is substantially devoid of fluid, said supporting means affording downward movement of the container as fluid is admitted thereto, and first and second resilient means for respectively damping vibratory movements of the container, said first resilient damping means being more effective to damp vibratory movements than said second resilient damping means, and said first and second damping means being selectively rendered active and inactive in response to upward and downward movements of the container.

12. In laundry apparatus, the combination of a substantially cylindrical tub having an access opening provided in one end thereof, a basket disposed within the tub for enclosing cleaning fluid and the fabrics to be treated, drive means connected to said basket and operable to actuate the same at relatively low speed for washing fabrics and at relatively high speed for drying fabrics, said drive means being located at the end of the tub remote from the access opening, said basket, tub and driving means defining a unitary structure, means for resiliently supporting said structure and inertia stabilizing means provided on the tub near the end containing the access opening.

13. In apparatus for cleaning fabrics and for centrifuging cleaning fluid therefrom, the combination of a container for receiving a body of washing fluid and the fabrics to be treated, means for agitating the fabrics in the body of fluid for cleaning the fabrics, means for rotating the fabrics in the container at relatively high speed for extracting cleaning fluid therefrom, a metallic spring system for resiliently supporting the container during both cleaning and extracting periods and affording downward and upward movement thereof as cleaning fluid is admitted to and discharged from the container, respectively, and a body of non-metallic resilient material relatively inactive to support the container during fluid extracting periods and rendered active to support, at least in part, the container in response to downward movement of the container effected by the admission of cleaning fluid thereto.

14. In apparatus for cleaning fabrics and for extracting cleaning fluid therefrom, the combination of a basket for the fabrics having an axis of rotation which is substantially horizontal, a tub for retaining cleaning fluid disposed about the basket, means provided in the tub for rotatably supporting the basket, a rigid supporting member disposed near the upper portion of the tub, tension springs interposed between said rigid supporting member and the tub for affording freedom of movement thereof in all modes and means for damping vibratory movements of said flexibly supported tub.

15. In apparatus for cleaning fabrics and for extracting cleaning fluid therefrom, the combination of a basket for the fabrics having an axis of rotation which is substantially horizontal, a tub disposed about the basket, means for rotatably supporting the basket in the tub, drive

means located at one end of the tub and connected to the basket, said drive means being operable at relatively low speed for cleaning the fabrics and at relatively high speed for extracting cleaning fluid from the fabrics, inertia stabilizing means provided on the tub near the end thereof remote from said drive means, a rigid supporting member disposed near the upper portion of the tub, tension springs depending from said rigid supporting member and engaging the tub for flexibly retaining the latter in suspension, and means for damping vibratory movements of the tub.

16. In a machine for cleaning fabrics and for centrifuging fluid therefrom, the combination of a container for the fabrics and a body of cleaning fluid, means for admitting cleaning fluid to the container, means for discharging cleaning

fluid from the container, driving means for actuating the container at relatively low and high speeds, means for resiliently supporting said container, means relatively ineffective during high-speed operation of the container and relatively effective during low-speed operation of the container for damping vibratory movements of the container and control means movable to a plurality of stations for selectively effecting low-speed and high-speed operation of the container, the construction and arrangement being such that the damping means is effective to damp vibrations of the container when the control means is in a low-speed station and is relatively ineffective to damp vibrations of the container when the control means is in a high-speed station.

FRANK BRECKENRIDGE.

CERTIFICATE OF CORRECTION.

Patent No. 2,296,260.

September 22, 1942.

FRANK BRECKENRIDGE.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 4, second column, line 35, claim 4, strike out "provided on the tub"; and line 40, claim 5, for "and spaced so" read --and so spaced--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 10th day of November, A. D. 1942.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.