

Nov. 16, 1948.

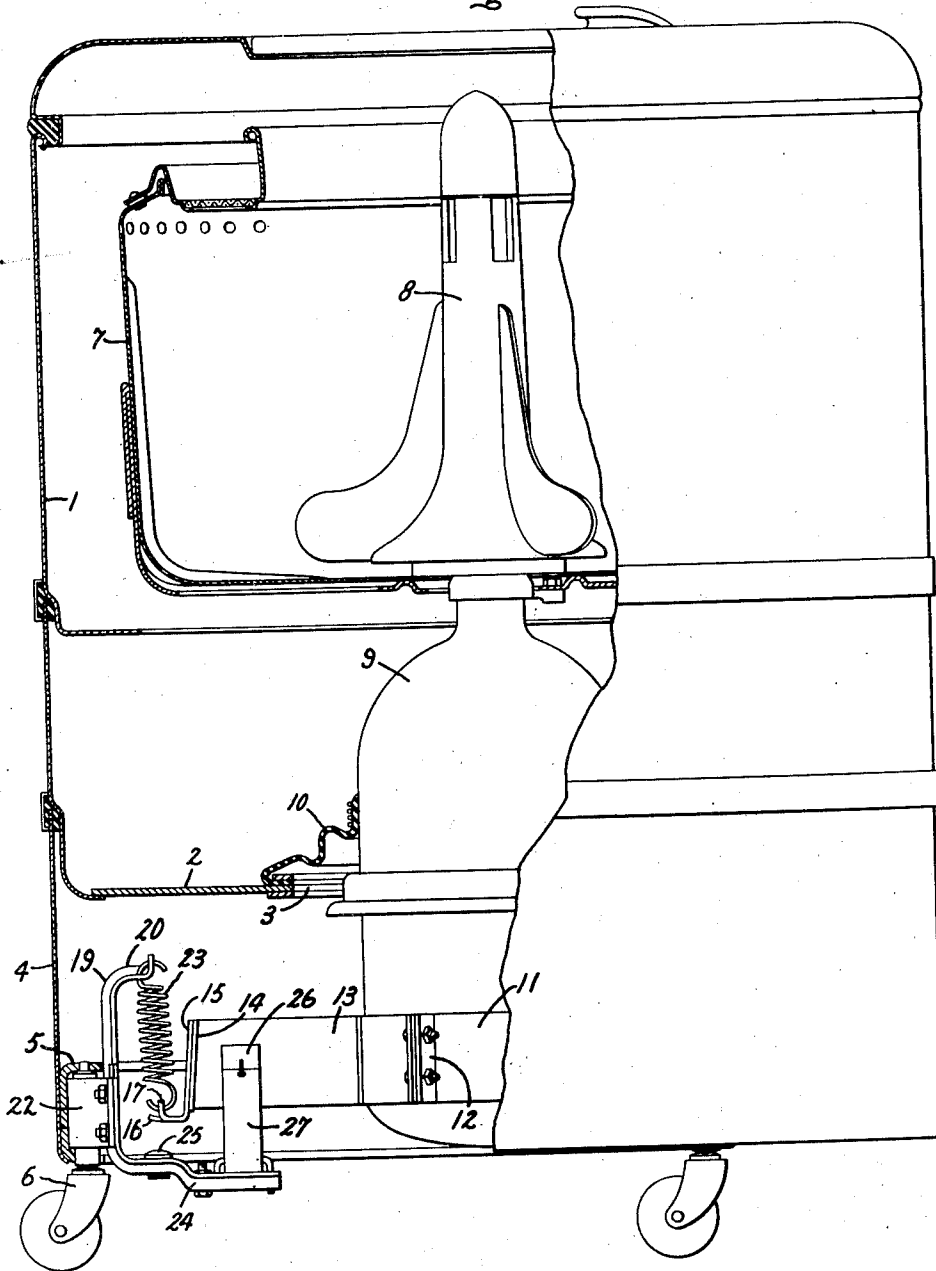
T. T. WOODSON
SUPPORT FOR SPIN BASKET FOR CLOTHES-WASHING
MACHINES AND THE LIKE

2,454,112

Filed Feb. 24, 1947

2 Sheets-Sheet 1

Fig. 1.



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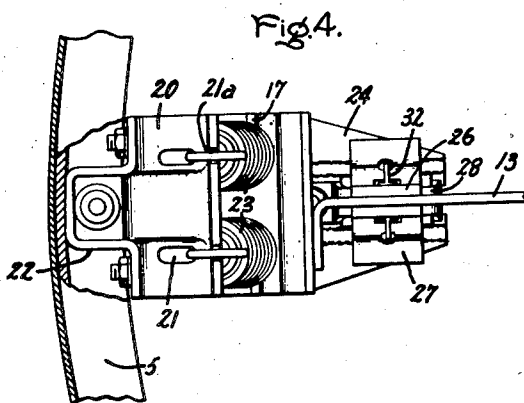
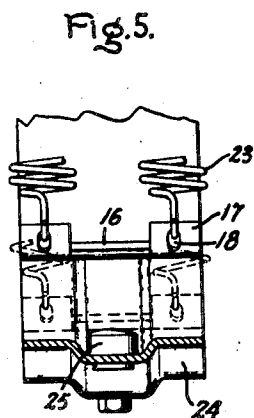
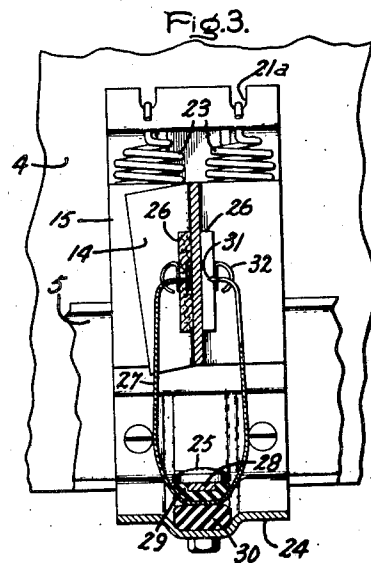
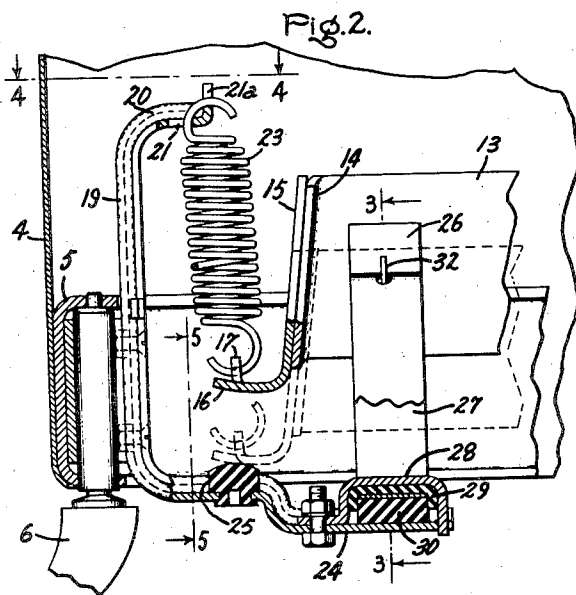
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,454,112

SUPPORT FOR SPIN BASKET FOR CLOTHES-
WASHING MACHINES AND THE LIKEThomas T. Woodson, Bridgeport, Conn., assignor
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Application February 24, 1947, Serial No. 730,308

6 Claims. (Cl. 210-72)

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The present invention relates to machines, such as clothes washing machines having a spin basket or receptacle which is mounted for rotation on a vertical axis for centrifugally extracting liquid from material in the basket and which may have considerable unbalance due to unequal distribution of weight in the basket.

My invention is particularly applicable to extractor clothes washing machines and it is this application which I have elected to particularly illustrate and describe. It is to be understood, however, that the invention is not limited thereto necessarily but may be used wherever found applicable.

The object of my invention is to provide an improved support for a spin basket which is relatively simple in structure, reliable in operation and capable of being manufactured at low cost.

For a consideration of what I believe to be novel and my invention, attention is directed to the following specification and to the claims appended thereto.

In the drawing, Fig. 1 is a side elevation, partly in section, of a clothes washing machine embodying my invention; Fig. 2 is a detail sectional view on a larger scale of a spring support and friction damper; Fig. 3 is a detail sectional view taken on line 3-3, Fig. 2; Fig. 4 is a plan view taken on line 4-4, Fig. 2 and Fig. 5 is a detail view taken on line 5-5, Fig. 2.

My invention is in the nature of an improvement over that disclosed and claimed in the patent to Dunham 2,268,204, December 30, 1941, assigned to the same assignee as my present application.

Referring to the drawing 1 indicates a tub of a suitable construction having a bottom wall 2 provided with a central opening 3. The tub is supported on a skirt 4, the lower end of which is fixed to an annular channel iron 5 which in turn is supported on suitable casters 6. In the tub is a unitary structure comprising a spin basket 7 having liquid discharge openings at its upper edge, an agitator 8 and a casing 9. In casing 9 is a suitable mechanism comprising shafts for the agitator and basket, an electric motor and gearing connecting the motor to the shafts. In operation, the motor through the gearing oscillates the agitator shaft for washing, the basket and its shaft then being stationary, and rotates the basket and agitator shafts as a unit to centrifugally extract water from clothes in the basket. For example, the mechanism in casing 9 may be similar to that disclosed in my application Serial No. 551,096, filed August 25, 1944. Casing 9 projects down through opening 3, the space between the casing and the

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opening being sealed by a suitable conical-shaped flexible gasket 10, one end of which is attached to casing 9 and the other end to bottom wall 2.

The foregoing construction is to be taken as typical of any unitary construction including a spin basket to be mounted in a tub or receptacle and to be rotated on a vertical axis. My invention has to do particularly with the construction and arrangement for mounting the unitary construction.

In a machine of this type wherein a washing operation is performed in a spin basket mounted on a vertical axis, the basket being stationary during the washing operation, it is important that during the washing operation the spin basket be held in a stable position and that during the spinning operation a minimum of vibratory forces be transmitted to the outside casing of the machine. According to my invention, I provide maximum position stability for the basket during washing by supporting it at fixed points spaced circumferentially around the basket; and I provide isolation for the basket during spinning by supporting it during spinning on spring of low gradient and in connection therewith providing vibration damping means the frictional forces of which are primarily in a vertical direction whereby they are transmitted to the floor or other support for the machine and not to the outer casing.

Clamped to the lower end of casing 9 is a ring 11 the ends of which may be fastened together as indicated at 12 to firmly attach the ring to the casing. Carried by the ring are a plurality of radially projecting arms 13. For example, three such arms may be provided. At their outer ends, each arm is provided with a flange 14 to which is fixed a plate 15 on the lower end of which is a foot 16 and spaced upwardly turned ears 17, one on each side of the foot. Ears 17 are provided with openings 18, Fig. 5. Fixed to channel iron 5 in radial alignment with each arm 13 is a bracket 19 having a head 20 at its upper end in which are openings 21 and notches 21^a in line with openings 18. Brackets 19 may be attached to the channel iron 45 through the intermediary of U-shaped brackets 22 as shown particularly in Fig. 4. The essential thing is that brackets 19 be rigidly attached to the channel iron 5. At 23 are springs which at their upper and lower ends are hooked into openings 21, 21^a, and 18, respectively, as best shown in Fig. 2. This arrangement provides two springs in connection with each arm 13.

On the lower end of each bracket 19 is a radially inwardly extending foot 24 on which is provided a resilient pad 25 positioned beneath foot 16. Also

carried by each foot 24 is a pair of friction plates 26 which are held in engagement with the side surface of arms 13 by U-shaped spring clamps 27. Each spring clamp 27 is attached to its foot 24 by a U-shaped clamp 28, the bottom of the clamp 27 being positioned between resilient pads 29 and 30. Clamps 28 are pulled down so that pads 29 and 30 are under slight precompression. The purpose of these pads is to provide elasticity allowing comparatively unrestrained side motion of clamp 27, but little vertical motion. Further, the resilient nature of the pads minimizes the transmission of motor hum from the mechanism in casing 9 to the exterior of the machine. The friction system provides friction forces substantially only in the vertical plane of arms 13.

As will be seen from Fig. 3, the bottom of clamp 27 is held between the pads over a relatively narrow width, leaving the free ends of the arms of clamps 27 unrestrained. The free ends of the arms of clamps 27 are turned inwardly as shown in Fig. 3 and engage in V-shaped notches 31 in plates 26 to attach the plates to the arms. At 32 are clips which are suitably attached to plates 26 and engage openings in the arms of clamp 27 to hold the clamps against sidewise movement. Spring clamps 27 are relatively strong so that each arm 13 is gripped tightly by a pair of friction plates 26. By providing notches 31 in which the intumed ends of the arms of clamp 27 are positioned, a good connection is obtained which avoids backlash between such arms and the friction pads. Also the rubber mounting 29, 30 since it is under slight compression assists in avoiding backlash.

In use, clothes to be washed are placed in the spin basket 7 and the basket is filled with water to the correct level for the washing operation. The weight of the clothes and water as related to the strength of springs 23 is such that feet 16 rest on pads 25 as shown in dotted lines in Fig. 2. This serves to hold the unitary structure including the basket 7 stationary in a vertical position while the agitator 8 is operated to perform the washing operation. The arrangement is such that the springs 23 support the major portion of the weight, the feet 16 resting rather lightly on the pads. For example, the pads may support a portion of the weight of the order of 5 per cent. The springs are utilized in pairs and as will be noted are in tension, not in compression. I prefer to utilize tension springs because tension springs give greater stability. If desired, however, I may use compression springs, the use of springs in pairs enables the use of a low spring rate in a given short length along with small radial space at the end of arms 13. They may be wound to give the desired characteristics. The pads 25 are at a substantial radial distance from the axis of the unitary structure and are spaced circumferentially around the machine. By this arrangement, they serve to support the basket effectively and keep it stable during the washing operation.

For centrifugal extraction, the basket and agitator are rotated as a unit. The basket starts from rest and initially the unitary structure is held from tilting by pads 25. The arrangement is such that when the speed of rotation of the basket has reached a value of the order of 100 R. P. M., at which time the rotating mass will have passed through its first critical speed, sufficient water will have been discharged from the basket through the ring of openings at its upper edge so that springs 23 lift feet 16 off pads 25

leaving the unitary structure free to gyrate about its axis of rotation. Before gaining this position, and before reaching full speed, the motion of the top of the unitary structure is a gyratory circle during unbalanced spin. This same gyratory circle is present at the bottom of springs 23 due to the motion of the lower end of the unitary structure, and also at the ends of the suspension arms 13. The gyratory motion is dampened and suppressed by the friction plates 26 which oppose the vertical component of the circle both up and down. They do not oppose the lateral component of the circle. The dampening force stays constant at all speeds but acts over shorter and shorter distances as the amplitude of vibration decreases with rising speed. It will be noted that by reason of the arrangement of the spring clamps 27, the damping means is flexible by bending of the arms of clamps 27 only for motions rotating about the machine vertical axis. It is stiff for radial forces and for vertical forces parallel to the vertical axis. This serves to give the maximum damping action.

By reason of the structure of the clamps 27 and their radial positions with respect to the vertical axis of the machine, i. e., by reason of the relatively long arms 13, the vibration damping means may be said to be direction selective in that the major portion of the friction forces are vertical and are transmitted to the floor or other support for the machine. Some horizontal frictional forces obtain but they are of relatively small value and being located at the bottom of the outer casing produce little visible vibration of the outer casing.

By my invention, I provide a relatively low cost structure which meets the requirements of effectively isolating the unitary structure from the outer casing during spinning to prevent vibration of the unitary structure being transmitted to the outer casing and of providing position stability for the basket during washing. At the same time, the structure is easy to assemble and requires no adjustment.

In accordance with the provisions of the patent statutes, I have described the principle of operation of my invention, together with the apparatus which I now consider to represent the best embodiment thereof, but I desire to have it understood that the apparatus shown is only illustrative and that the invention may be carried out by other means.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In combination, a unitary structure comprising a spin basket, a casing and mechanism in the casing for rotating the basket; a support surrounding the lower end of the structure in radially spaced relation thereto, circumferentially spaced radially extending arms carried by the lower end of the structure, brackets carried by the support having ends positioned over the ends of said arms, tension spring means connecting the ends of the arms to the ends of said brackets, and friction damping means carried by said support engaging the sides of said arms whereby they serve to dampen vibration in a vertical direction.

2. In combination, a unitary structure comprising a spin basket, a casing and mechanism in the casing for rotating the basket; a support surrounding the lower end of the structure in radially spaced relation thereto, circumferentially spaced radially extending arms carried by the lower end of the structure, brackets carried

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by the support having ends positioned over the ends of said arms, tension spring means connecting the ends of the arms to the ends of said brackets, friction damping means carried by said supports engaging said arms, and supporting means carried by said support adjacent said arms on which the arms rest when the spring means is distended a predetermined amount due to load in the basket.

3. In combination, a unitary structure comprising a spin basket, a casing and mechanism in the casing for rotating the basket; a support surrounding the lower end of the structure in radially spaced relation thereto, circumferentially spaced radially extending arms carried by the lower end of the structure, brackets carried by the support having ends positioned over and beneath the ends of said arms, tension spring means connecting the upper ends of the arms to ends of said brackets, friction damping means carried by the lower ends of said brackets engaging said arms for dampening vibration, and pads on the lower ends of said brackets on which the outer ends of said arms rest when the spring means is distended a predetermined amount due to load in the basket.

4. In combination, a unitary structure comprising a spin basket, a casing and mechanism in the casing for rotating the basket; a support surrounding the lower end of the structure in radially spaced relation thereto, circumferentially spaced radially extending arms carried by the lower end of the structure, brackets carried by the support having ends positioned over the ends of said arms, pairs of tension springs connecting the ends of the arms to ends of said brackets, and friction damping means carried by said support each comprising a U-shaped spring clamp having its free ends positioned on opposite sides of an arm, and friction means positioned between said free ends and the sides of the arm.

5. In combination, a unitary structure comprising a spin basket, a casing, and mechanism in the casing for rotating the basket; a support surrounding the lower end of the structure in radially spaced relation thereto, circumferentially spaced radially extending arms carried by the lower end of the structure, brackets carried

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by the support having ends positioned in line with the ends of said arms, spring means located between the ends of the arms and the ends of said brackets, friction damping means carried by the ends of said brackets engaging said arms for dampening vibration, and pads on the ends of said brackets on which the outer ends of said arms rest when the spring means is actuated a predetermined amount due to load in the basket.

6. In combination, a unitary structure comprising a spin basket, a casing and mechanism in the casing for rotating the basket; a support surrounding the lower end of the structure in radially spaced relation thereto, circumferentially spaced radially extending arms carried by the lower end of the structure, brackets carried by the support having ends positioned in line with the ends of said arms, spring means located between the ends of the arms and the ends of said brackets, U-shaped spring clamps fastened at their bases to said bracket ends with the ends of their arms positioned on opposite sides of said radially extending arms, friction plates held in engagement with said radially extending arms by said clamp arms, and pads on the lower ends of said brackets on which the outer ends of said arms rest when the spring means is actuated a predetermined amount due to load in the basket.

THOMAS T. WOODSON.

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