

Aug. 12, 1930.

G. W. DUNHAM

1,772,602

CENTRIFUGAL MACHINE

Filed March 25, 1927

3 Sheets-Sheet 1

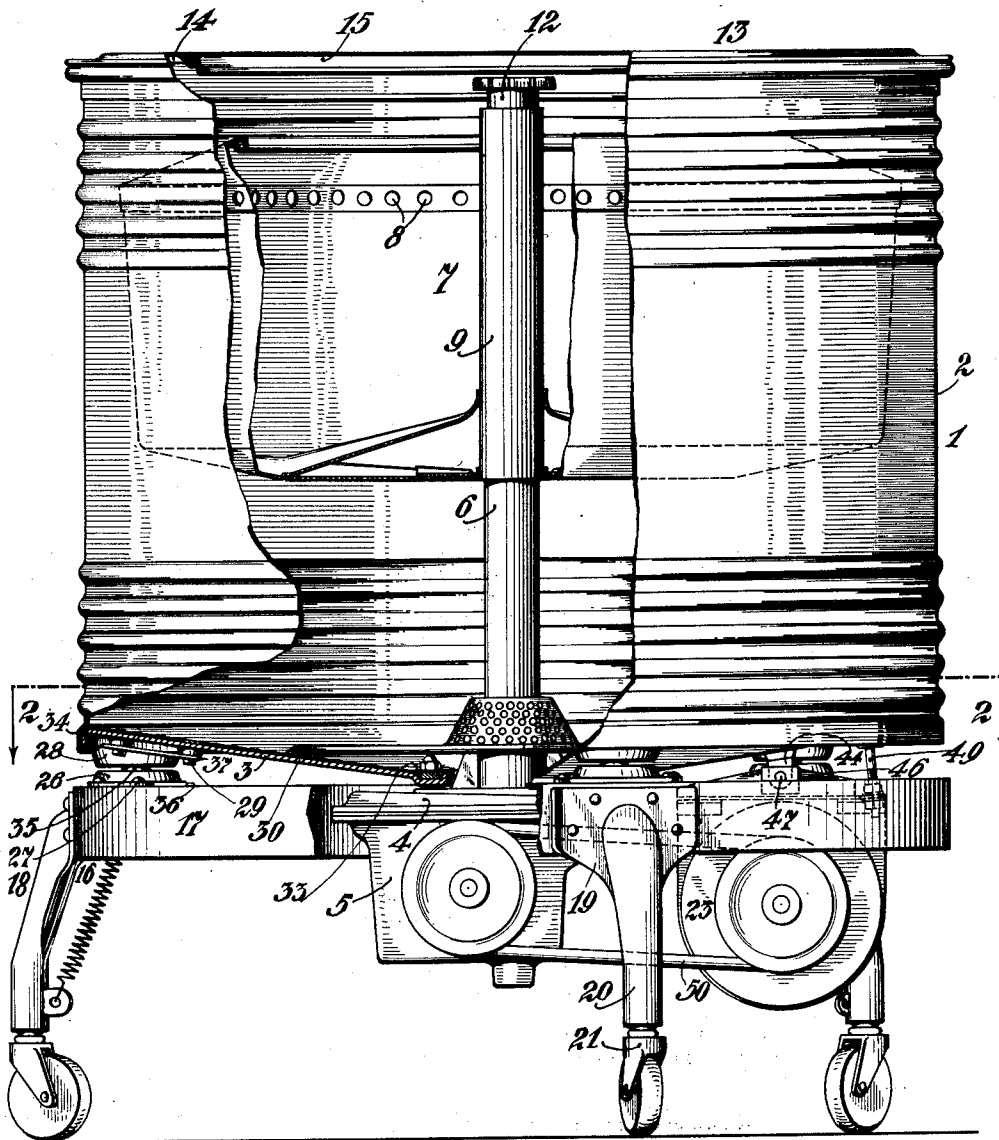


Fig. 1.

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3 Sheets-Sheet 2

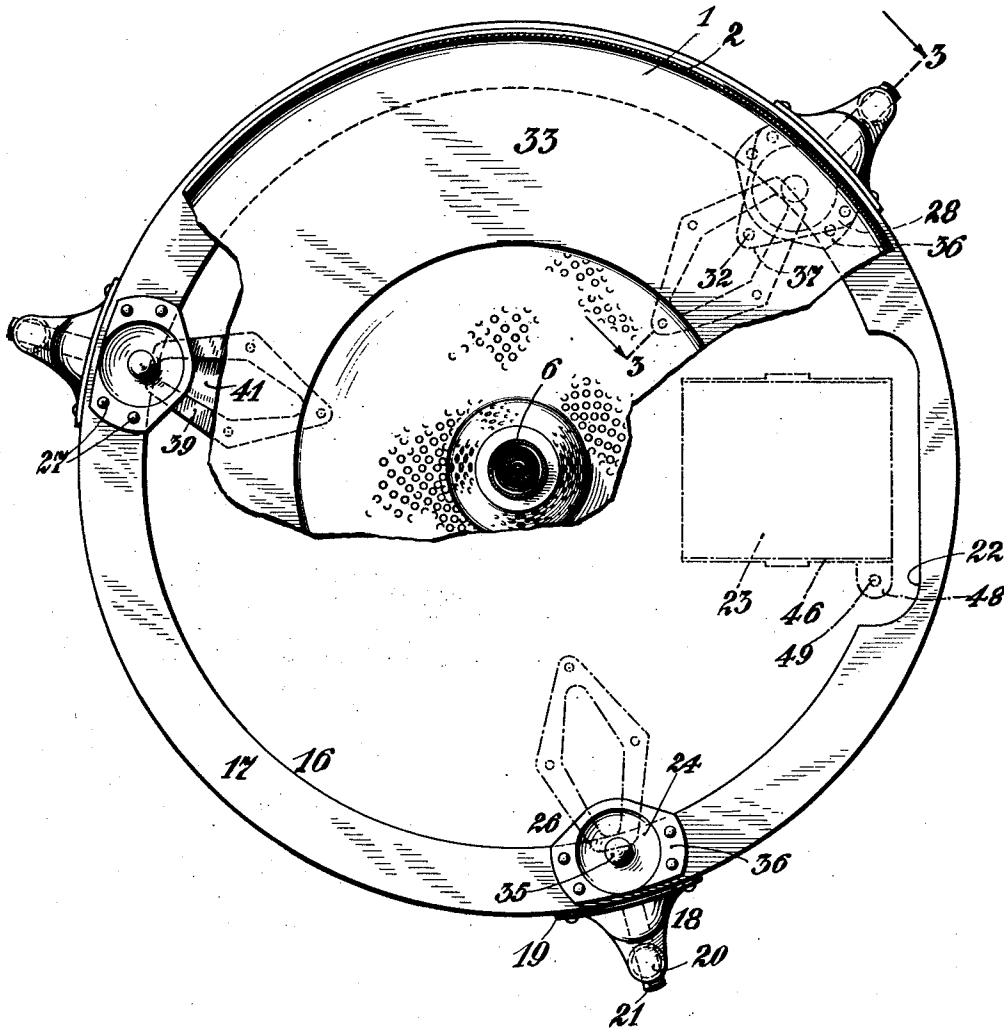


Fig. 2

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Fig. 4

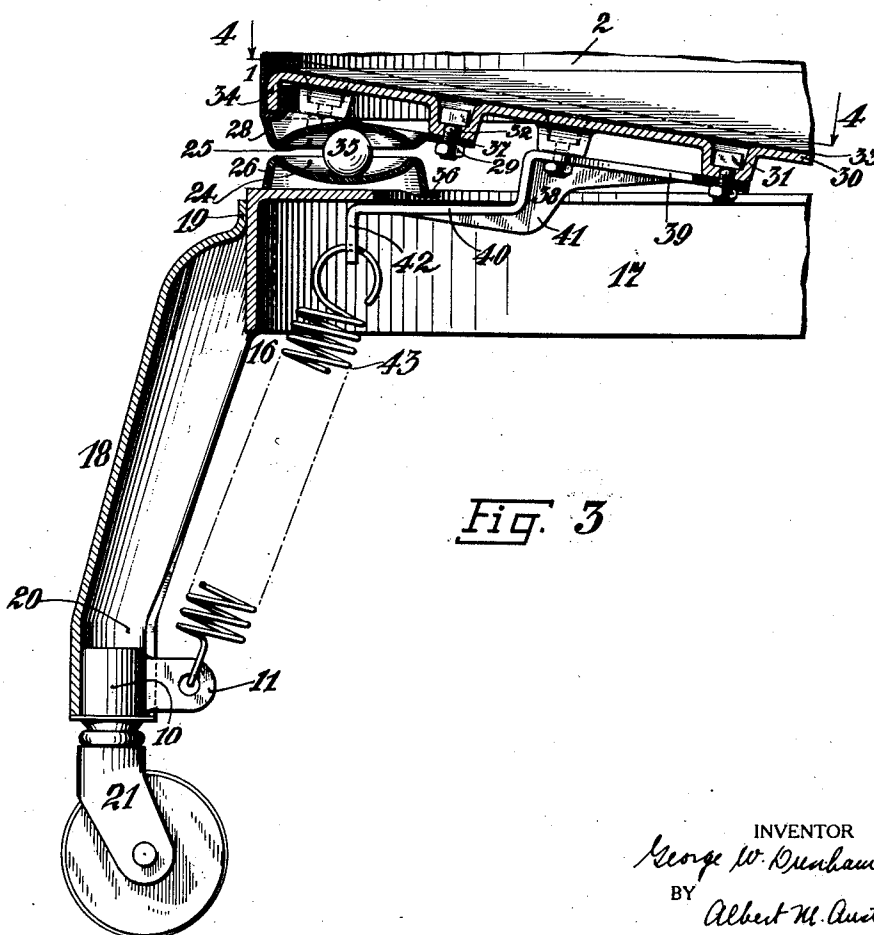
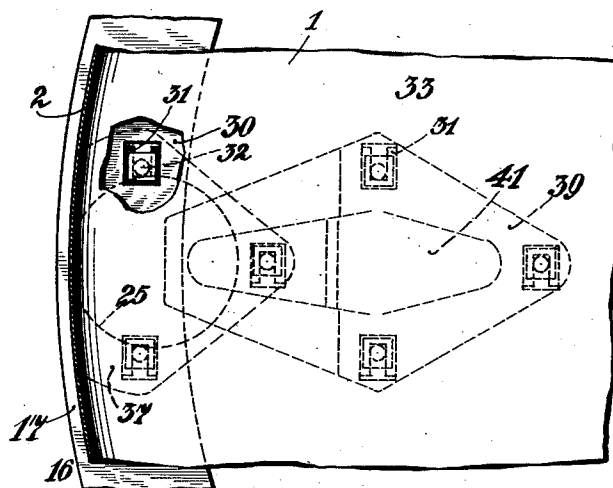


Fig. 3

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CENTRIFUGAL MACHINE

Application filed March 25, 1927. Serial No. 178,229.

The invention relates, in general, to centrifugal machines, and, more particularly, to a compensating or balancing arrangement for a centrifugal machine.

5 According to the invention, a centrifugal machine is provided which may be in the form of a household laundry machine. This machine may comprise a support which may be a tank having a receptacle or basket rotatably supported therein. Means may be provided for rotating the receptacle or basket to extract liquid from the contents thereof. Furthermore, an under-frame may be provided which may have legs with ordinary 10 casters on the bottom, to enable the machine to be easily moved from place to place.

According to the invention a compensating arrangement is provided between the tank or support and the under-frame, which will compensate for or balance the tendency of the machine to gyrate when the receptacle is unevenly loaded. The compensating arrangement allows the tank a small lateral movement relative to the underframe, the tank 20 always tending to take a central position with respect to the underframe. Devices may be also employed to hold the parts in assembled relation, to prevent the tank from separating from its underframe when the machine is moved around or shipped.

Various other features and advantages of the invention will be apparent from the following particular description and from an inspection of the accompanying drawings.

35 The invention also consists in certain new and original features of construction and combination of parts hereinafter set forth and claimed.

Although the novel features which are believed to be characteristic of this invention will be particularly pointed out in the claims appended hereto, the invention itself, as to its objects and advantages, the mode of its operation and the manner of its organization 45 may be better understood by referring to the following description taken in connection with the accompanying drawings forming a part thereof, in which

Fig. 1 represents an elevation with parts 50 broken away, showing a well known type of

laundry machine with the invention applied thereto;

Fig. 2 is a section on the line 2—2 of Fig. 1 with part of the tank broken away to show the under-frame;

Fig. 3 is a detail on the line 3—3 of Fig. 2 showing the construction of one of the compensating units;

Fig. 4 is a detail taken on the line 4—4 of Fig. 3.

In the following description and in the claims parts will be identified by specific names for convenience, but they are intended to be as generic in their application to similar parts as the art will permit.

Like reference characters denote like parts in the several figures of the drawings.

Referring now to the drawing, a well known type of laundry machine with the invention applied thereto is used for the purpose of illustrating the invention. It will be understood, however, that the invention is applicable to any kind of centrifugal extraction machine. In the embodiment shown, the machine comprises a tank 1 having a generally cylindrical side wall 2 and a conical bottom wall 3 sloping to an opening in the middle thereof. Supported by the bottom wall 3 is a pedestal assembly comprising a horizontally disposed centrifugal pump 4 having inlet openings (not shown) connecting with the tank and suspended from the tank bottom 3 by suitable fastening devices. Suitably suspended from the pump 4 is a gear box 5 having the necessary gearing for operating the machine. Supported by the pump 4 is a hollow pedestal 6, on the top of which is rotatably mounted an imperforate type receptacle 7.

The receptacle 7 may be generally imperforate except for a plurality of discharge openings 8 near the top thereof. The receptacle 7 may be provided with a central hub 9 which has a suitable bearing on the pedestal 6 and has a suitable clutch arrangement for clutching and unclutching the receptacle to suitable drive shafting within the hollow pedestal. The clutch is operated by a clutch sleeve 12 and is shown in its clutching position with the

receptacle 7 operatively secured to its drive shaft for continuous rotation.

The tank 1 is provided with a two-part cover 13 comprising an outer flat ring 14 and an inner lid 15 seating on the ring 14. The outer ring 14 may be left in position during operation of the machine to act as a water retaining ring to prevent water from splashing out of the tank. It is only necessary to remove the lid 15 to introduce the articles to, and remove them from, the receptacle.

The under-frame 16 comprises a ring 17 of angle iron having secured to the cylindrical flange thereof three equally spaced legs 18 arranged to give a three point support. Each of these legs, which may be conveniently made from sheet material, has an upper flat portion 19 suitably bolted or riveted to the ring 17. The lower portion 20 of the leg is in the form of a split sleeve and houses the sleeve 10 of a conventional wheel caster 21, the shank thereof being free to rotate in the sleeve 10 so that the machine can be moved in any direction, the construction of this type of caster being old and well-known. Secured to the split sleeve 20 is an apertured ear 11. This ear 11 may be conveniently formed integral with the sheet material of the leg 18 and bent outwardly from the split sleeve 20 as shown. The ring 17 is provided with a cut-away portion 22 to provide clearance space for the motor 23, as shown in Fig. 2.

Secured to the horizontal flange of the supporting ring 17 and directly over each leg is a lower cup 26. The cup 26 may be conveniently made of sheet metal bent to form a concave upper surface 24 and attaching flanges 36 by which the cup is secured to the supporting ring 17 with the aid of four fastening devices 27 which may be rivets or bolts and nuts. Cooperating with each lower cup 26 is an upper cup 28 which may be conveniently made of sheet material bent to form a concave lower surface 25 and an attaching flange 37 by which the cup is secured to the tank bottom by the aid of three bolts 32 and nuts 29.

The tank bottom 3 is made up of a suitable supporting plate 30 of heavy sheet steel having a plurality of depressed sockets 31, the sockets being square in horizontal cross section, and having openings in the sides and bottoms thereof so that square headed bolts 32 may be positioned in the sockets from beneath the supporting plate 30. A thin lining 33 of metal is provided over the top of the supporting plate 30 to make the bottom of the tank water-tight. The side wall 2 of the tank is made of generally thin sheet material, being secured to the bottom 3 of the tank by being bent or rolled around a depending outer flange 34 formed by bending the bottom plate 30 and lining 33, as shown clearly in Fig. 3.

Disposed between each pair of lower and upper cups 26 and 28 is a steel ball 35. Cooperating with each pair of cups is a stop

member 38 which comprises an attaching portion 39 which is attached to the bottom plate 30 by three bolts, in a manner similar to the manner in which the upper cups 28 are secured to the bottom plate. Each stop 38 has a lower offset foot 40 which is disposed under the horizontal flange of the under-frame ring 17. A suitable ridge or rib 41 is provided to provide the necessary strength to the stop member 38. The end of the foot 40 may be bent downwardly to form an apertured ear 42. A suitable coil spring 43 may be provided to connect the ears 11 and 42, there being a spring at each leg, as will be understood. These springs 43 act to cause the tank to continuously seek a central position on the under-frame.

Suspended from the bottom of the tank is a motor support 44. The motor 23 is suitably secured to an attaching plate 46 which is pivotally secured to the support 44 by a bolt 47. The side of the attaching plate 46 has an apertured lug 48 through which passes an adjusting bolt 49. Suitable nuts are provided to adjust the portion of the lug 48 on the bolt 49 to adjust the tension of the belt 50 which provides the drive connection between the motor and the gear box 5. The motor support 44 and the adjusting bolt 49 may be secured to the tank bottom by means of the socket construction explained in connection with the upper cups 28.

It will be seen that the tank is supported at its outer edge by means of the ball and cup arrangement, and the entire pedestal assembly is supported by the bottom at the center thereof, the bottom plate 30 providing the necessary structural strength.

In operation, the articles to be washed are placed in the imperforate type receptacle 7, and suitable washing devices and liquid are provided for washing the laundry while it is in the imperforate receptacle. After the washing operation is over, and it is desired to dry the laundry, the clutch is thrown so as to connect the receptacle with the driving mechanism to continuously rotate the same at a speed sufficient to cause liquid to rise and be discharged through the discharge openings 8.

If the load in the receptacle is unevenly distributed, the receptacle will tend to rotate about an axis other than its normal axis, causing a gyrating effect and tending to cause the tank to move laterally. The tank is allowed its lateral movement by means of the upper cups moving on the balls supported on the lower cups. The stops 38 not only may limit the movement of the tank upon the under-frame when the compensating device is functioning, but also prevent separation of the tank from its under-frame when the machine is moved about.

The springs 43 resist forces causing the tank to move relatively to the underframe

and cause the tank to continuously seek a normal central position on the under-frame. The springs 43 also act to prevent pounding between the stop members 38 and the ring 17.

5 The provision of large conventional casters on the legs allows the machine to be moved about in any direction from place to place very easily and without marring the floor. When the machine is rotating during centrifugal extraction, the tank will gyrate relatively to the under-frame, but the under-frame will remain stationary with respect to the floor on which it is supported.

15 Thus it will be seen that a centrifugal machine has been provided which has an efficient compensating arrangement. The necessity of placing caster cups under the casters after the machine has been rolled to its proper position has been eliminated. The compensating arrangement is an integral part of the machine and is always in operative position.

25 While certain novel features of the invention have been shown and described and are pointed out in the annexed claims, it will be understood that various omissions, substitutions and changes in the forms and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention.

What is claimed is:—

1. In combination, a tank having a bottom, a receptacle in said tank, means for rotating said receptacle including devices suspended directly from said bottom, an underframe comprising a ring, legs for supporting said ring, and a plurality of compensating devices between said ring and said bottom, said devices being suspended within and below said ring.

2. In combination, a tank, a pedestal extending up from the bottom of said tank, a receptacle having an imperforate portion for holding liquid and mounted on said pedestal, means for rotating said receptacle to extract liquid therefrom, an under-frame comprising a ring, three legs secured to said ring, casters attached to the lower ends of said legs, three annularly spaced, concave cups secured to said ring, one over each leg, a plurality of upper, cooperating, concave cups secured to said bottom, a ball between each pair of cooperating cups, and a plurality of stops secured to said bottom and having feet disposed under said ring, one stop under each lower cup.

3. In combination, a tank, a pedestal extending from the bottom of said tank, a receptacle having an imperforate portion for holding liquid and mounted on said pedestal, means for rotating said receptacle to extract liquid therefrom, an underframe comprising a ring, three legs secured to said ring, casters attached to the lower ends of said legs, three

annularly spaced, concave cups secured to said ring, one over each leg, a plurality of upper, cooperative, concave cups secured to said bottom, a ball between each pair of cooperating cups, and a plurality of stops secured to said bottom and having feet disposed under said ring, one stop under each lower cup, said stops having attaching ears, said legs having cooperative attaching ears at the lower ends thereof, a coil spring connecting each pair of cooperating attaching ears.

4. In combination, a support, a member rotatable about a vertical axis on said support, an underframe for supporting said support, a plurality of cups secured to said support, a plurality of cooperating cups secured to said underframe, and means between each pair of cooperating cups for allowing relative movement between said support and underframe, a spring for each pair of cups, said springs being secured to said underframe and to said support, said springs acting to cause said support to seek a predetermined position on said underframe.

5. In combination, a support, a receptacle mounted on said support, means for rotating said receptacle to extract liquid therefrom, an underframe having a plurality of legs, compensating devices allowing relative movement between said support and underframe including springs extending from the lower ends of said legs to said support.

6. A household laundry machine comprising a tank, a receptacle therein, means for rotating said receptacle about a vertical axis to dry articles held by said receptacle, a supporting frame, casters on said frame to allow easy movement of said machine about, and a compensating arrangement between said frame and tank for allowing said tank a limited movement with respect to said frame, said movement being caused by rotation of said receptacle.

In testimony whereof I hereunto set my hand.

GEORGE W. DUNHAM.