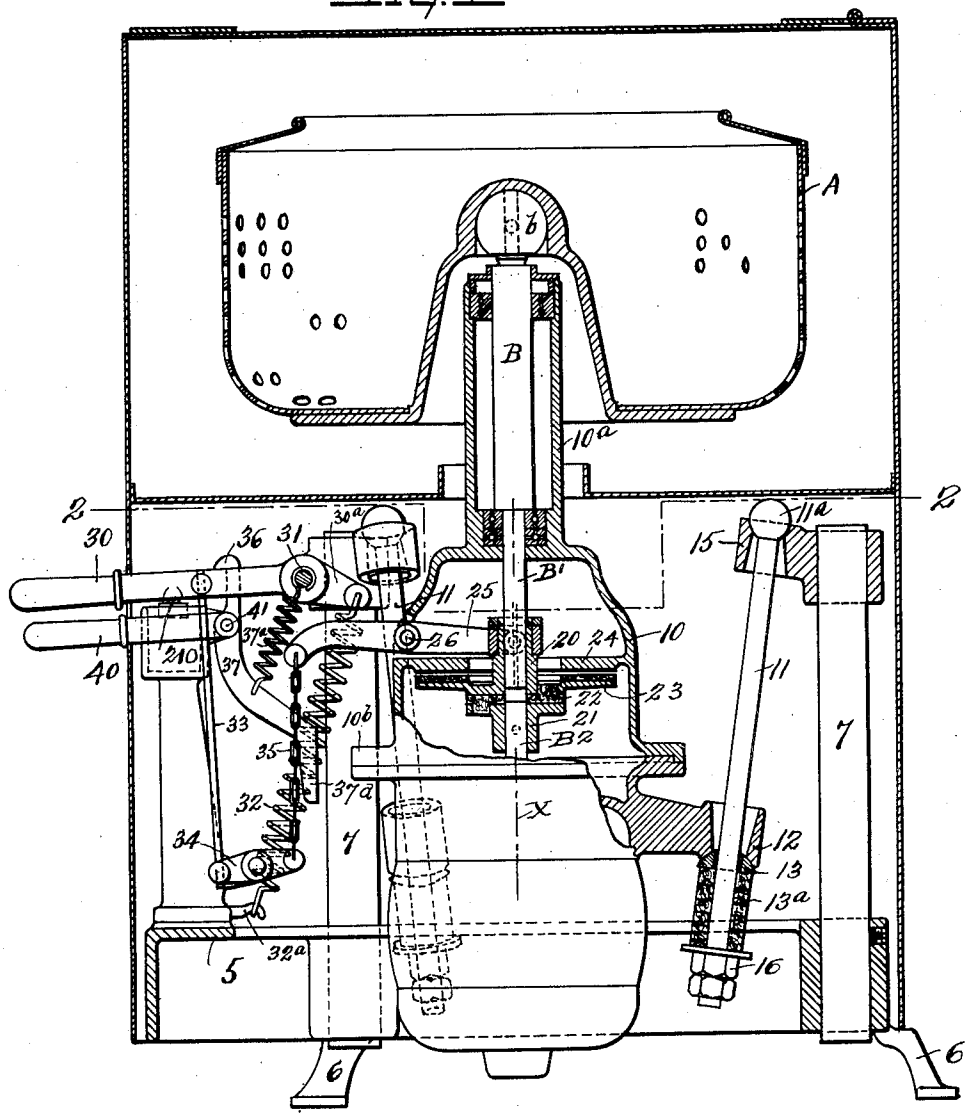
March 11, 1930. C. F. MEYER 1,750,016

CENTRIFUGAL MACHINE

Filed Nov. 30, 1925 2 Sheets-Sheet 1

Fig. 1



Christian F. Meyer,

INVENTOR.

BY W. F. D. Stewart

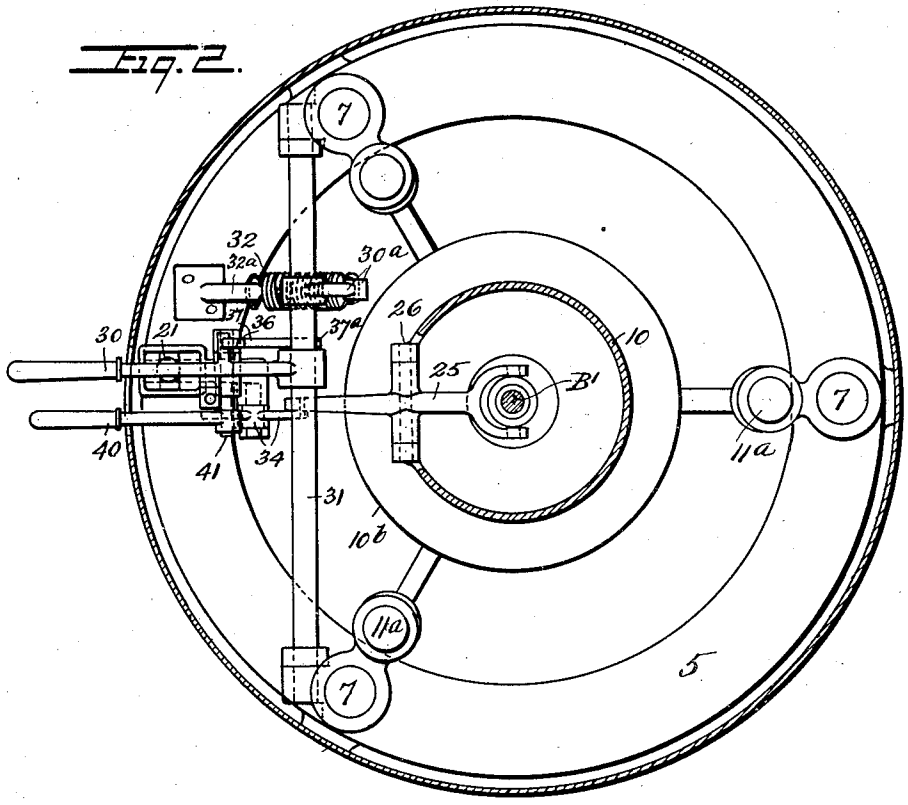
ATTORNEYS.

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CENTRIFUGAL MACHINE

Filed Nov. 30, 1925 2 Sheets-Sheet 2

Fig. 2.



Christian F. Meyer,
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Patented Mar. 11, 1930 1,750,016

UNITED STATES PATENT OFFICE

CHRISTIAN F. MEYER, OF WYOMISSING, PENNSYLVANIA, ASSIGNOR TO TEXTILE MACHINE WORKS, OF WYOMISSING, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA

CENTRIFUGAL MACHINE

Application filed November 30, 1925. Serial No. 72,173.

My invention relates to centrifugal machines such as hydro-extractors, and particularly to improved mountings therefor adapted to secure steadiness of operation under uneven-load conditions; as fully set forth hereinafter in connection with the accompanying drawings illustrating a preferred practical embodiment of the invention, with subjoined claims clearly defining the novel features thereof.

Fig. 1 is a sectional elevation of a complete machine embodying the invention in preferred form; the operating parts being shown in normal relation.

Fig. 2 is a cross-sectional view on the line 2—2 of Fig. 1.

The perforated-wall container bowl A is adapted as indicated for drying clothes placed therein, by centrifugal action due to rapid rotation thereof with the supporting motor shaft B; the bowl being rockably carried on the upper end *b* of the latter, as shown, at a point above its center of gravity and so as to automatically adjust itself when the bowl is more or less unevenly loaded. The motor shaft B is shown as suitably mounted in a motor housing which is itself movably supported in a suitable machine frame; which arrangement broadly has been heretofore employed with a view to enabling such automatic movement of the housing as would prevent the destructive and dangerous vibration to which these machines are liable under uneven-load conditions. My present invention consists in providing for most effectively securing this desired result by means of a mounting arrangement which enables a substantially horizontal adjusting movement of the combined motor housing and shaft simultaneously with free rocking movement of the container upon the latter, whereby the rotation is automatically steadied as hereinafter fully described, the required stopping and starting means employed being adapted to operate without interfering with the automatic adjusting movements incident to such steadying of the rotation, which movements involve the radial shifting of the vertical shaft and its axis of rotation around the normal or static axis X indicated in the drawings.

As shown, the frame base 5, having floor legs 6, is provided with three rigid columns 7, upon the upper end bearing; brackets of which the motor and shaft housing 10, 10^a is carried by means of three concentrically hung freely swingable suspension rods 11, such as have been heretofore employed to support centrifugal machine casings so that said combined housing and motor shaft B B′ B^2 mounted therein, can swing jointly in a substantially horizontal plane. The housing 10, within which the motor mechanism is operatively arranged in connection with the vertical shaft B′ B^2 is provided with concentric exterior suspension-rod connections 12 having ball-socket bearings supported upon spherical collars 13 on the rods 11, while the latter have spherical upper ends 11^a similarly mounted in bracket bearings 15 on the columns 7; so that the housing and its motor shaft will be free to swing jointly in a substantially horizontal plane, as stated. As shown I arrange the three fixed suspension bearings 15 in a somewhat larger circle about the central axis of rotation than that of the housing connections 12, so that the tendency of the horizontally movable housing and shaft is to return to said central axis; such arrangement involving no material departure from the joint horizontal swinging of the housing and shaft during practical operation. In order to eliminate slight but actually harmful vibrations otherwise liable to occur in the starting and stopping of the machine, I have found it important to provide yielding supports under the spherical suspension rod collars 13 such as rubber washers 13^a interposed between their supporting nuts 16 and the collars, these yielding washers serving to prevent initiation of vibratory movements.

The armature connecting portion B^2 of the shaft B, is rotated by a motor located in the lower portion of housing 10, as controlled by a suitable starting-and-stopping switch indicated at 210; and it is arranged, as indicated, to drive the upper shaft portion B′ B through coupling sleeves 20—21 cooperatively connected by a rotatably-engaging disc 22; the feathered sleeve 20 being provided with a friction-brake flange 23 adapted to be moved into

frictional stopping engagement with a partition wall 24 of the housing when said sleeve 20 is raised by a brake lever 25 pivoted to the housing at 26. The disc 22 is adapted to prevent such braking movement of the flanged sleeve 20 while maintaining connection of the shaft portions B′ B².

The starting lever 30 is fixed to a pivot rod 31 on the machine frame and is normally raised by a spring 32 connected to the frame at 32ª so as to operate the brake lever 25 and apply the friction brake 23—24 for stopping the rotation of the bowl; this action being effective as shown through a link connection 33, a rock-arm 34, and a flexible chain connection 35, between said levers 30 and 25. As shown in Fig. 1 however, the starting lever 30 is lowered into operating position, and is so held by a latch 36; contact being thus made with the motor switch 210, and the brake lever 25 being released to free the friction brake 23—24. In order to stop rotation, the latch 36 must be thrown out of lever locking position; this being primarily effected by means of a stop lever 40, which is fixed to a pivot shaft 41 to which the latch arm 37 is also secured, so that the raising of stop lever 40 will release the latched starting lever 30 against the latching action of a spring 37ª, to thereby cut off the switch 210 and apply the friction brake. To provide for automatically effecting the same result in case any undue horizontal movement of the housing 10 should occur, the lower end 37ᵈ of the latch arm 37 is arranged to position at such a distance from the housing flange 10ª when the latch is closed, as to be operatively struck when the housing is moved horizontally beyond the range provided for automatically steadying the rotation of the bowl.

It will be understood from the foregoing description of the specific mechanism shown, that the essential purpose and effect of my invention is to so mount the bowl-rotating shaft and its motor mechanism, as to enable joint bodily movement of these in a substantially horizontal plane, for shifting the base of the shaft axis relative to the normal axis of rotation X, with which it is shown coincident in Fig. 1; the bowl itself being rockably mounted on the shaft B as usual; and the starting and stopping mechanism being arranged so as not to interfere with such free horizontal movement of the shaft and its motor housing, excepting only as the stopping function may be automatically brought into action, as specifically set forth, to safeguard against accidental excessive swing of the housing and shaft.

The joint horizontal movement of the bowl-rotating shaft and its motor housing which my invention provides for, is produced automatically whenever the bowl is rotated with an unevenly distributed load,—a condition which inevitably occurs in greater or less degree in practical operation,—and is incidental to a natural tendency of the rotating parts to adjust themselves for steady running under uneven load conditions when permitted to do so as in my improved mounting: This action being conclusively evidenced by the fact that my improved machine as specifically set forth not only runs with seemingly absolute steadiness under uneven load conditions at the so called "critical speed of rotation", but also effectively steadies itself in getting up speed so as to insure against the dangerous and destructive vibrating action commonly incident to the operation of such centrifugal machines. Satisfactory scientific theorizing as to just how this steadying action automatically results under the conditions provided by my invention is at least difficult, as indicated by such recent discussion of the admittedly unsolved problems involved as appears in "Mechanical Engineering" November 1924, by the instructor of mechanics of engineering, Cornell University; but my novel construction for attaining such results has been so set forth as to readily enable the securing of them, either by the specific construction shown or such modification thereof as embodies the essential features of the invention defined in the claims.

What I claim is:

1. In a centrifugal machine comprising a supporting frame and a motor-and-shaft housing having a limited bodily movement thereon; a container-carrying motor shaft having a movable brake sleeve thereon, a sleeve-engaging lever pivoted to said housing, and a starting lever pivoted to said frame and having flexible connections to said sleeve-engaging lever whereby it is adapted to reversely operate said sleeve irrespective of the housing position relative to the frame.

2. In a centrifugal machine comprising a supporting frame and a motor-and-shaft housing having a limited bodily movement thereon; a container-carrying motor shaft having a movable brake sleeve thereon, a sleeve-engaging lever pivoted to said housing, a spring-pressed starting lever pivoted to said frame and having flexible connections to said sleeve-engaging lever, a latch adapted to lock said starting lever in brake releasing position, and a stop lever for releasing said latch.

3. In a centrifugal machine comprising a supporting frame and a motor-and-shaft housing having a limited bodily movement thereon; a container-carrying motor shaft having a movable brake sleeve thereon, a sleeve-engaging lever pivoted to said housing, a spring-pressed starting lever pivoted to said frame and having flexible connections to said sleeve-engaging lever, a latch adapted to lock said starting lever in brake releasing position, and a stop lever for re-

leasing said latch having a safety extension arranged adjacent said movable housing.

4. In a centrifugal machine comprising a supporting frame and a vertical motor shaft carrying at its upper end a rockably supported container; a motor and housing for said shaft supported by said frame below the container upon a circular series of downwardly converging suspension rods having universal-joint frame mountings and yieldingly supported universal-joint connections to the housing mounting; whereby the axis of said motor and housing tends by gravity to assume a normal axis of rotation but is balancingly shiftable during rotation to varying approximately parallel positions relative to said normal axis, with simultaneous automatic adjustment of the rockable container upon said shifting axis of rotation, substantially as set forth.

In testimony whereof I affix my signature.

CHRISTIAN F. MEYER.