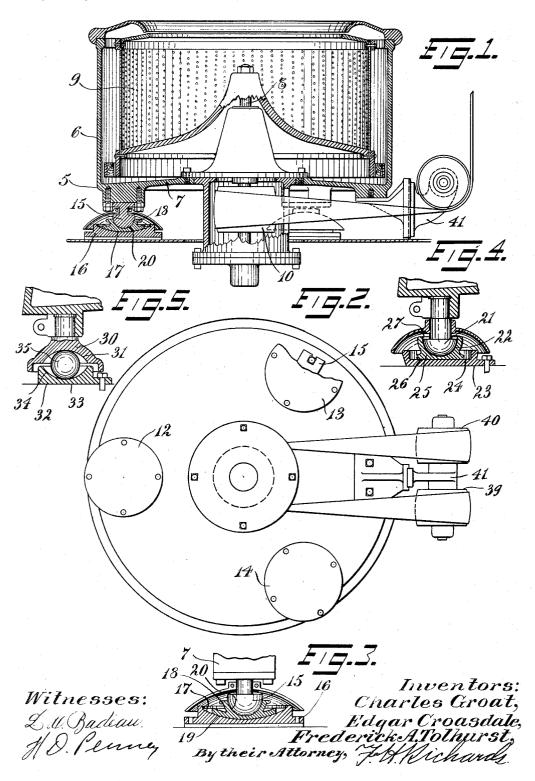
C. GROAT, E. CROASDALE & F. A. TOLHURST. CENTRIFUGAL MACHINE.

APPLICATION FILED DEC. 13, 1910.

1,005,963.

Patented Oct. 17, 1911.



UNITED STATES PATENT OFFICE.

CHARLES GROAT AND EDGAR CROASDALE, OF TROY, AND FREDERICK A. TOLHURST, OF NEW YORK, N. Y.

CENTRIFUGAL MACHINE.

1,005,963.

Specification of Letters Patent.

Patented Oct. 17, 1911.

Application filed December 13, 1910. Serial No. 597,125.

To all whom it may concern:

Be it known that we, CHARLES GROAT and EDGAR CROASDALE, citizens of the United States, residing at Troy, in the county of Rensselaer and State of New York, and FREDERICK A. TOLHURST, a citizen of the United States, residing in New York city, county and State of New York, have invented certain new and useful Improve-10 ments in Centrifugal Machines, of which the following is a specification.

The object of this invention is to provide an improved arrangement of supporting means for machines that operate at a high 15 speed, and are, therefore, liable to impart an objectionable vibration to the machine itself, as well as to the place where it is supported, and adjacent portion of the

The construction is especially designed for mechanism using a vertical drive shaft and with machines operating on the centrifugal principle for the purpose of separating water and other liquids from solid ma-25 terials, which machines are sometimes

*known as hydro-extractors.

In the accompanying drawings representing modifications of our invention, Figure 1 is a vertical axial section, certain parts being 30 shown in elevation. Fig. 2 is a bottom view. Fig. 3 is a section enlarged through one of

the supports, shown in Fig. 1. Figs. 4 and 5 show modified forms of the support shown

in Fig. 3.

35 The invention is shown applied to a machine in the nature of a hydro-extractor, and comprises essentially a frame member or case $\hat{5}$, having sides 6 and a bottom 7. At the center is a vertical shaft 8 that carries the receptacle or basket 9, rotated at a high speed by suitable driving means for the shaft, such as a pulley 10 on the lower

portion of the shaft. Machines of this character must be driven at a high speed, rang-45 ing from 450 to 2500 revolutions per minute, that usually results in an excessive and objectionable vibration being induced in the support upon which the machine rests. In

the present invention a supporting means 50 is provided that permits a substantially universal shifting movement in a horizontal direction and preferably a series of such means are provided.

In the construction illustrated there is a 55 plurality of supporting devices, 12, 13, and 1

14, that are shown arranged in a circular series around the axis of the shaft. These are identical, and each is shown in Figs. 1 and 3 as comprising a base 16 that may have a flat bottom, the top face 17 being 60 formed concave with a comparatively long The case 5 has three depending members 15 secured thereto with the lower extremity formed convex, and in this construction shown as semi-spherical. Between 65 these two members that are reversely curved is a cup member 18, whose bottom 19 is formed convex of a curvature corresponding with that of the concave face 17, with which it engages; and with a top face 70 20 formed concave corresponding to the convex foot member 15, that rests therein, as shown in Figs 1 and 3. Preferably the bottom of the cup member has its curvature with a radius considerably greater than the 75 radius of curvature of the foot member resting in the concave top face of the cup. The operation of this construction is as follows: Upon the high speed being applied to the shaft and the basket or other member, 80 a lateral vibration of the vertical shaft is induced. But this is absorbed by means of the several cups that are shiftable in a substantially horizontal direction, and such lateral movement will be thereby overcome and 85 practically annihilated. At the same time the movement in any direction from the central position of the cups will have the effect of raising the center of gravity of the device and tend to limit this movement 90 and also to cause it to return to the normal lowermost position. This takes the place of springs or other elastic members tending to limit the shifting movement. There is therefore, nothing to become worn or to re- 95 quire adjustment, as with the use of springs or rubber.

In Fig. 4 is shown a slight modification of the foot member, comprising a foot 21 having its lower face 22 semi-spherical as 100 with the foot 15. The base member 23 is provided having its bottom face 26 also flat. The upper face 27 of this cup member is concave to receive the convex foot member 21.

In the modification shown in Fig. 5, a foot member 30 has its lower face 31 formed concave of comparatively long radius. The base member 32 has a flat bottom 33 and a concave top face 34 of comparatively long ra- 110

105

Between these two opposed concave faces, 31 and 33 is located a supporting member having its opposite sides formed convex, and of a less curvature than that of

the concave face of the engaged member. Preferably a ball or sphere 35 is interposed between these two faces, and such faces engaging the ball may have the same radius of curvature. The operation of these two 10 modifications are the same as described

with reference to Figs. 1 and 3.

The shaft 8 carrying a basket is shown mounted in a bearing 36 connected with the bottom member 7 of the casing, and also a 15 bearing 37 extending downwardly from the bottom member 7. The pulley 10 is placed on the shaft intermediate these two bearings. This pulley is shown as driven by a belt 38, that passes around two guide pul-20 leys 39 and 40, supported on a bracket 41 at the side of the machine. From these pulleys the belt may pass upward if de-

sired. Having thus described our invention,

25 what we claim is:-

1. In a high speed machine mounting, having a vertically arranged rotating member, comprised of a machine frame and base, a plurality of rigidly attached supports on 30 said base, a plurality of rigidly secured floor plates, one for each support, having horizontally movable members between said machine base supports and said floor plates to accommodate any lateral movement of said 35 machine.

2. In a machine having a member rotated on a vertical shaft, a combination of a series of supports, each formed in three parts, two parts having engaging faces formed concave 40 and convex, respectively, one part being rigidly attached to the base of said machine in semi-spherical engagement with the intermediate sliding piece, to permit sliding movement thereof in all lateral directions, 45 said shaft being supported by an upper and

lower bearing in the machine, and a belt pulley on the shaft located between said

3. In a machine having a member rotated 50 on a vertical shaft, a combination of a series of supports, each formed in three parts, two parts having engaging faces formed concave and convex, respectively, one part being rigidly attached to the base of said machine

55 in semi-spherical engagement with the intermediate sliding piece, to permit sliding movement thereof in all lateral directions, said shaft being supported by an upper and lower bearing in the machine, and a belt 60 pulley on the shaft located between said bearings, and a pair of guide pulleys at the

side of the machine in alinement with said pulley to guide the belt for the said pulley.

4. In a machine provided with a member 65 rotatable on a vertical axis, a series of supports, each support comprising a foot member having its lower end convex, and a cup member having its upper face concave to receive said convex foot member.

5. In a machine provided with a member 70 rotatable on a vertical axis, a series of supports, each support comprising a foot member having its lower end convex, and a cup member having its upper face concave to receive said convex foot member, said engag- 75 ing faces having the same radius of curvature.

6. The combination of a machine having a frame, a series of supporting devices, each comprising a foot member carried by the 80 frame and having its bottom convex, a base member having its upper face formed concave, and a cup member having its lower face of the same curvature as the concave face of the base and supported thereon to be 85 shiftable over the base, the cup member having its upper face formed concave and of a curvature corresponding with the convex surface of the said foot member depending from the frame, whereby the cup member 90 supports the frame and is permitted a substantially universal movement by the sliding engagement of the said two pairs of concave

and convex engaging surfaces.

7. The combination of a machine having 95 a frame, a series of supporting devices, each comprising a foot member secured to the frame and having its bottom convex, a base member having its upper face formed concave with a comparatively large radius, and 100 a cup member having its lower face of the same curvature as the concave face of the base and supported thereon to be shiftable over the base, the cup member having its upper face formed concave and of a curvature 105 and corresponding with the convex surface of the said foot member depending from the frame, whereby the cup member supports the frame and is permitted a substantially universal movement by the sliding engage- 110 ment of the said two pairs of concave and convex engaging surfaces, the curvature of the base member and the engaging face of the cup member being of different radius than the curvature of the upper face of the 115 cup member and that of the engaging face of the depending foot member.

8. The combination of a machine having a frame, a series of supporting devices, each comprising a foot member secured to the 120 frame and having its bottom convex, a base member having its upper face formed concave with a comparatively large radius, and a cup member having its lower face of the same curvature as the concave face of the 125 base and supported thereon to be shiftable over the base, the cup member having its upper face formed concave and of a curvature corresponding with the convex surface of the said foot member depending from 130

the frame, whereby the cup member supports the frame and is permitted a substantially universal movement by the sliding engagement of the said two pairs of concave of the base member and the engaging face of the cup member being of greater radius than the curvature of the upper face of the cup member and that of the engaging face of the

depending foot member and a cover plate 10 over the cup members.

CHARLES GROAT. EDGAR CROASDALE. FREDERICK A. TOLHURST.

Witnesses:

ARTHUR J. CADY, JOHN FERGUSON.