No. 828,628. PATENTED AUG. 14, 1906.

W. A. SAUNDERS.

BEARING FOR CENTRIFUGAL MACHINES.

APPLICATION FILED AUG. 14, 1905.

2 SHEETS—SHEET 1.

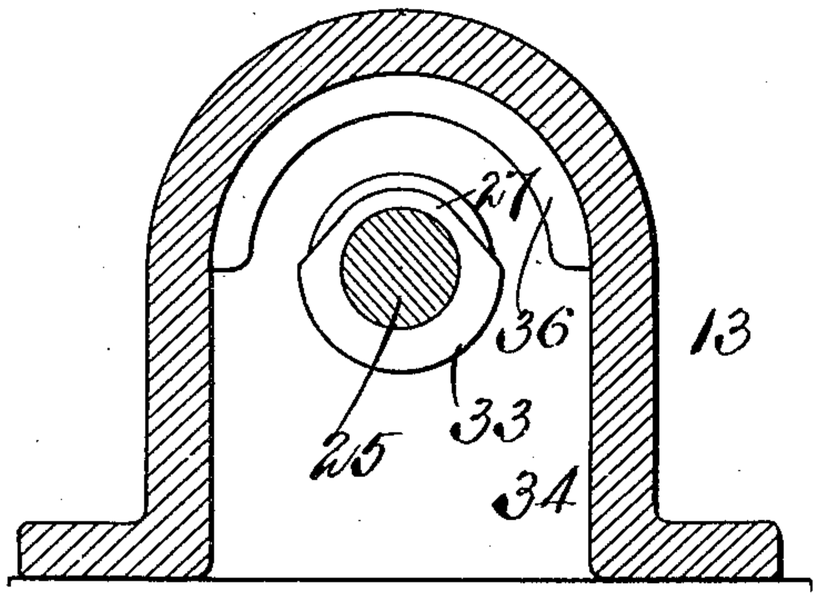

Fig-3-

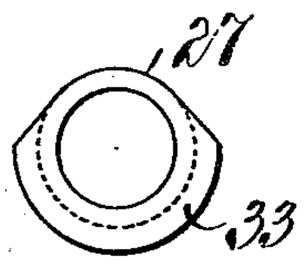

Fig-4-

Fig-1-

WITNESSES=

William C. Glass

Franklin & Sou.

INVENTOR=

William A. Saunders

by his attorney. Charles S. Goodwin.

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2 SHEETS—SHEET 2.

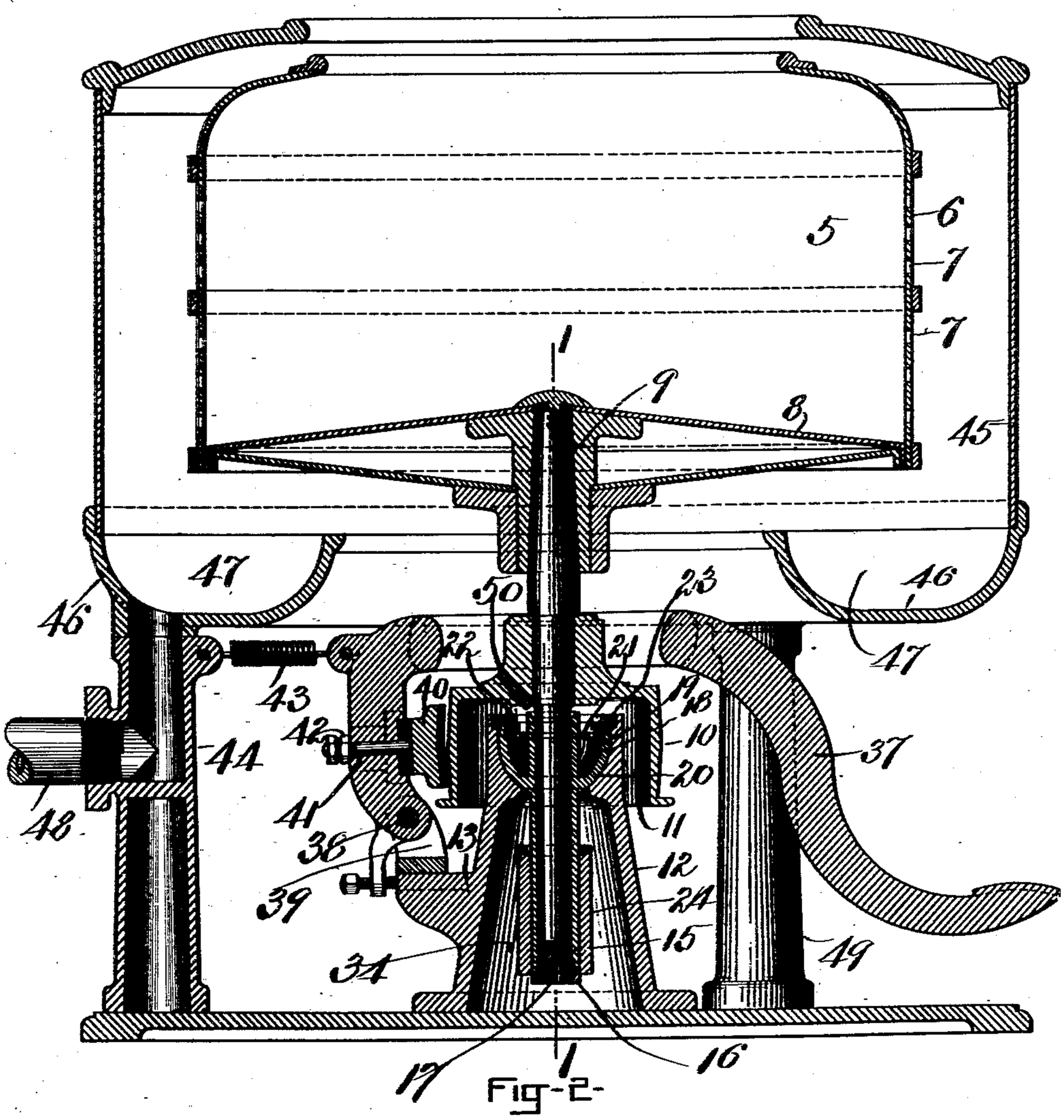

Fig-2-

WITNESSES=

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UNITED STATES PATENT OFFICE.

WILLIAM A. SAUNDERS, OF ROXBURY, MASSACHUSETTS.

BEARING FOR CENTRIFUGAL MACHINES.

No. 828,628. Specification of Letters Patent. Patented Aug. 14, 1906.

Application filed August 14, 1905. Serial No. 274,041.

To all whom it may concern:

Be it known that I, WILLIAM A. SAUNDERS, a citizen of the United States, residing at Roxbury, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Bearings for Centrifugal Machines, of which the following is a specification.

This invention relates to an improved bearing for centrifugal machines, the same being particularly adapted to laundry-machines of the class known as "centrifugal extractors," in which wet clothing is placed in a rapidly-rotating basket having perforations in the sides thereof, said basket being inclosed within a casing and the water extracted from the clothing by centrifugal force passing through the perforations in the basket and into the outer casing surrounding said basket, from which it is conducted by suitable piping to a drain-pipe or receptacle provided therefor. In machines of this class the rotary speed is very high, and it is very essential that the bearings of the main shaft should be very thoroughly lubricated and supplied with a constant source of lubricating material in order that the shaft may not become heated and the bearings roughened up and spoiled. It is also essential that some compensating device should be connected to the bearing of the main shaft which will automatically compensate for differences in load caused by the clothing in the basket hereinbefore referred to being unequally distributed therein.

The invention consists in the combination and arrangement of parts set forth in the following specification and particularly pointed out in the claims thereof.

Referring to the drawings, Figure 1 is a vertical section, partly in elevation, of my improved bearing, the same being taken on line 1 1 of Fig. 2, with the basket and casing removed. Fig. 2 is a vertical detail sectional elevation of the same, taken on line 2 2 of Fig. 1, showing said bearing in connection with the basket, casing, framework, and brake of a centrifugal extractor. Fig. 3 is a detail section, taken on line 3 3 of Fig. 1, partly shown in elevation. Fig. 4 is an end elevation of the friction-bushing.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, 5 is a cylindrical basket consisting of a cylindrical metal shell 6, provided with perforations 7, said shell being fastened to a bottom 8, which is fastened to a vertical shaft 9. The vertical shaft 9 has fastened thereto a pulley 10 immediately below the basket 5, said pulley being provided with a chamber 11, into which the upper end of the cylindrical standard 12 of the frame 13 projects. The vertical shaft 9 rotates in a stepped-bearing sleeve 14, the lower end of said shaft resting upon washers 15 15, said washers in turn resting upon a plug 16, screwed into the lower end of the bearing-sleeve 14 and having a rectangular hole 17 in the under side thereof, so that a square-ended wrench may be inserted therein for the purpose of rotating the plug 16.

The upper end of the sleeve 14 has a hemispherical flange 18 fast thereto, which is provided upon its interior with an oil-chamber 19, the periphery of said flange fitted to rock in a hemispherical recess 20, formed in the upper end of the cylindrical standard 12. A perforated washer 21 surrounds the sleeve 14 within the oil-chamber 19 and projects into an annular groove 22, formed upon the interior of the flange 18 at the top thereof. The base-frame standard 12 projects upwardly beyond the top of said hemispherical flange and has an annular groove 23 formed in the top thereof. The center of the hemispherical flange 18 is located in a horizontal plane extending through the pulley 10, said horizontal plane being preferably midway between the top and bottom of said pulley or the median horizontal plane of said pulley.

A frictional device adapted to control vibrations of the shaft 9 and sleeve 14 is provided below the hemispherical flange 18 and consists of a bushing 24, having an arm 25 rigidly attached thereto by screw-threaded engagement therewith and locked against rotation with relation to said bushing by a lock-nut 26. The arm 25 projects through a friction-bushing 27. The friction-bushing 27 is provided with an annular flange 28, and upon opposite sides of said annular flange are provided packing-rings 29, constructed, preferably, of rubber, which encircle said bushing and are held in a recess 30, provided in the frame 13, by a stuffing-box 31, which is forced into said recess in the usual manner by bolts 32, so that said flange 28 is firmly held between the packing-rings 29 29. The bushing 27 is provided at its opposite ends with flanges 33 33, said flanges extending about half-way around said bushing and having, preferably, a sharp edge.

The frictional device hereinbefore described, together with the lower portion of the sleeve 14—that is, that portion of the sleeve which projects downwardly from the hemispherical flange 18—it will be noted, is contained within a chamber 34, provided in the interior of the frame 13. A cover 35 is hinged to the stuffing-box 31, covering the outer end of the arm 25 and bushing 27. An oil-guiding flange 36 is provided upon the interior of the chamber 34 integral with the frame 13 and projecting downwardly therefrom over the arm 25 and between the hemispherical flange 18 and rubber packing-rings 29.

A brake for stopping the rotation of the shaft 9 and the basket 5 is provided, consisting of a treadle 37, pivoted at 38 to a bracket 39, fast to the standard 12, said treadle being provided with a brake-shoe 40, fastened to said treadle by means of a bolt and nut 41 and 42, respectively. The brake-shoe 40 is held out of contact with the pulley 10 by means of a spring 43, one end thereof fast to said treadle, the other to one of the standards 44.

The basket 5 is surrounded by a casing 45, fast to a base 46, provided with an annular channel 47, which opens downwardly into the hollow standard 44, a pipe 48 being connected to said hollow standard to conduct away the water which is extracted from the clothing, as hereinbefore described. The base 46 is supported upon three standards 49, 49, and 44.

The operation of my improvements when embodied in a centrifugal extractor is as follows: A rapid rotary movement is imparted to the vertical shaft 9 and to the basket 5 by means of a belt and the pulley 10. This rapid motion causes the water to be extracted from the clothing by means of centrifugal force, said water passing through the perforations in the basket 5 into the casing 45 and downwardly into the channel 47, thence through the upper portion of the standard 44 and outwardly through the pipe 48 to a convenient receptacle or drain-pipe in a manner well known to those skilled in this art.

The lower portion of the sleeve 14 is held by the friction device hereinbefore described, consisting of the bushing 24, arm 25, friction-bushing 27, and packing-rings 29, against any extreme change in position, so that any variation in weight upon opposite sides of the basket is compensated for by a slight change in position of the vertical shaft, the sleeve 14, the arm 25, and the bushing 27, the arm 25 sliding longitudinally slightly in said bushing and said bushing tipping slightly to allow slight changes in position of the vertical shaft and the basket attached thereto, said sleeve 14 rocking upon the hemispherical flange 18 in the recess 20, formed upon the top of the cylindrical standard 12. It will be seen and understood that the rubber packing-rings 29 yield slightly to allow the friction-bushing 27 to accommodate itself to a slight change in vertical position of the vertical shaft 9 and the basket attached thereto, so that by the construction hereinbefore described the basket is self-centering and the vibrations caused by said basket seeking its center are controlled by the frictional device hereinbefore described.

It is very essential in a device of this character that the sleeve should be held by the frictional device at a point beneath the ball or hemispherical bearing-flange 18 in order to lessen the vibration caused by the rapidly-rotating basket with its load of clothing and water contained therein, and, further, it is very desirable that the rubber packing-rings and all of the frictional device should be protected from oil and water and also that the ball-bearing should be thoroughly oiled in order to prevent friction and roughing up of the same. It will be seen that oil introduced into the oil-chamber 19 through a hole 50 will overflow from said oil-chamber into the annular space above said hemispherical flange in the top of the standard 12 and in the annular groove 22, so that a large supply of oil is constantly present which lubricates the hemispherical flange 18 and the hemispherical recess 20 constituting the bearing for said flange. Any of the oil which passes downwardly from said hemispherical flange will pass around the inner surface of the standard 12 inside the chamber 34, but will be prevented from flowing downwardly into contact with the rubber packing-rings 29 by coming into contact with the oil-guiding flange 36, and any oil upon the surface of the arm 25 is prevented from traveling along the under side of the friction-bushing 27 by the oil-guiding flange 33 at each end of said bushing, the oil passing down the end of the bushing from the arm 25 and falling off the sharp lower edge of the flanges 33, so that it will be seen that the rubber packing-rings are well guarded against oil and that the different parts are conveniently and thoroughly supplied with oil, while the friction device and the sleeve 14 are protected from water which may be splashed from the basket and its receptacle by being entirely inclosed within the casing of the frame 13.

Having thus described my invention, what I claim, and desire by Letters Patent to secure, is—

1. A bearing for centrifugal machines comprising in its construction a vertical rotary shaft, a sleeve constituting a stepped bearing for said shaft, there being a hemispherical flange on the upper end of said sleeve, a base provided with a hemispherical recess therein, constituting a bearing for said flange, a frictional device consisting of a bushing encircling said sleeve beneath said flange, an arm

rigidly attached to said bushing, a friction-bushing into which said arm projects, there being an annular flange on said friction-bushing, packing-rings encircling said bushing upon opposite sides of said annular flange, a stuffing-box constructed to hold said packing in a recess formed in said base, said friction device and the portion of said sleeve below said hemispherical flange inclosed within a chamber provided in said base, there being an oil-guiding flange on said base extending around the interior of said chamber between said hemispherical flange and frictional device and above said arm, whereby oil from said oil-chamber is prevented from coming in contact with said packing.

2. A bearing for centrifugal machines comprising in its construction a vertical rotary shaft, a sleeve constituting a stepped bearing for said shaft, there being a hemispherical flange on the upper end of said sleeve provided with an oil-chamber therein, a base provided with a hemispherical recess therein constituting a bearing for said flange, a bushing encircling said sleeve beneath said flange, an arm rigidly attached to said bushing, a friction-bushing into which said arm projects, there being a flange having a sharp outer edge at each end of said bushing, and an annular flange on said friction-bushing, packing-rings encircling said bushing upon opposite sides of said annular flange, and a stuffing-box constructed to hold said packing in a recess formed in said base.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM A. SAUNDERS.

Witnesses:
CHARLES S. GOODING,
ANNIE J. DAILEY.