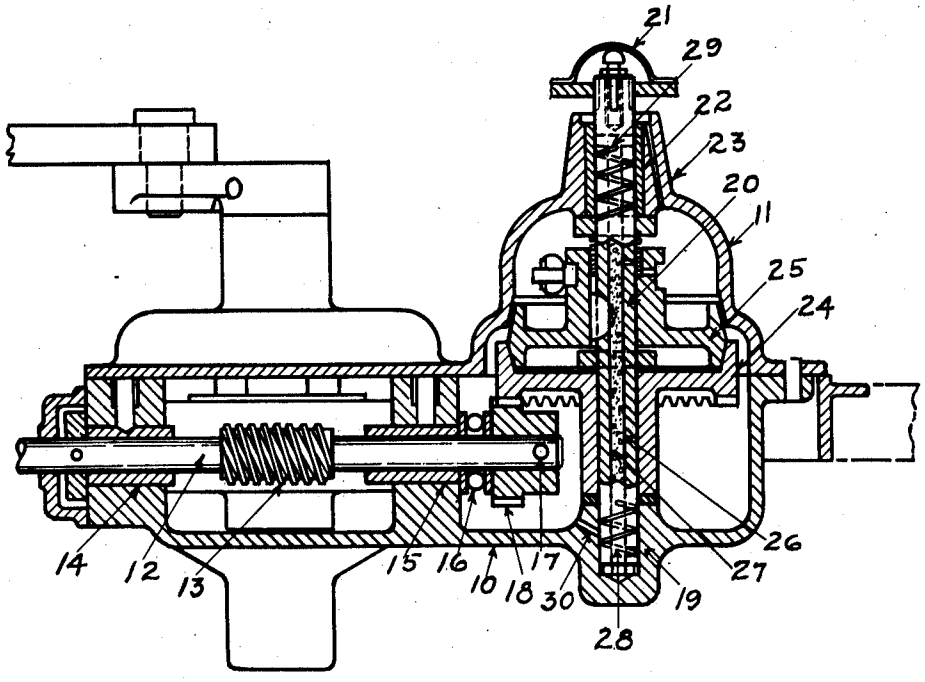
Dec. 15, 1931. M. A. DEFIBAUGH 1,837,020

LUBRICATING DEVICE

Filed Feb. 28, 1927



INVENTOR
Mark A. Defibaugh
PER Lepp and Lepp
ATTORNEYS

Patented Dec. 15, 1931

1,837,020

UNITED STATES PATENT OFFICE

MARK A. DEFIBAUGH, OF PEORIA, ILLINOIS, ASSIGNOR TO ALTORFER BROS. COMPANY, OF PEORIA, ILLINOIS, A CORPORATION OF ILLINOIS

LUBRICATING DEVICE

Application filed February 28, 1927. Serial No. 171,458.

This invention relates to mechanism for lubricating vertically disposed rotating shafts.

One of the objects of the invention is in the provision of a simple lubricating device for oiling the bearing portions of a vertically disposed, constantly rotating, drive shaft.

Another object is in the provision of lubricating means for the bearing portions of a vertically disposed drive shaft, said lubricating means being of a constantly circulating nature during the movement of said shaft.

Still another object is in the provision of lubricating mechanism for a vertically disposed drive shaft, said lubricating mechanism comprising an internal wick for the drive shaft and a spiral fashioning of the external portion of the drive shaft adjacent the bearing supports so as to provide an uninterrupted flow of lubricant to the bearing surfaces during rotation of said shaft.

A further object is in the provision of a vertically disposed, constantly rotating drive shaft, bearing supports therefor, and mechanism for continuously lubricating the bearing surfaces, comprising a peculiar fashioning and arrangement of the drive shaft, including a centrally disposed wick therein.

A still further object lies in the provision of a vertically disposed, constantly rotating drive shaft, and mechanism for continuously lubricating the bearing portions thereof without the use of auxiliary pressure pumps.

Other objects will appear in the following specification, taken in connection with the annexed drawings, in which the figure is a cross-sectional view, with portions thereof broken away for a more detailed disclosure of the lubricating mechanism.

Before referring to the drawings, it might be stated that the present lubricating device is adapted to be used in connection with the driving means of a combined washing machine and centrifugal extractor or drier disposed adjacent to said washing machine.

In normal operation, the water-impelling member of the washing machine is adapted to be reciprocated while the centrifugal extractor, a portion of the bottom of which is shown in the drawings, is adapted to be rotated continuously and at an excessively high speed. The means for driving the centrifugal extractor is a vertical shaft which obviously also must travel at a high rate of speed, and for this reason requires continuous lubrication of its bearing supports.

Washing machines of even the ordinary type, or of the combined type wherein a centrifugal extractor is used, have no provision for a pressure oiling system of the well known type, and must depend for lubrication upon a constant supply maintained in an enclosed gear case. Inasmuch as the vertical shaft has at least one of its bearing surfaces located above this oil supply, some means other than a normal gravity flow of lubricant must be provided for lubricating same to insure continuous efficient operation of the machine.

Combined washing machines and centrifugal extractors are a comparatively new art, and heretofore there has been provided no means for continuously oiling all of the bearing surfaces of the vertical drive shaft for the centrifugal extractor.

In order to overcome the disadvantages that attend the vertical disposition of the centrifugal extractor drive shaft when not continuously oiled, applicant has provided the following lubricating means for oiling same.

Referring to the drawings, a gear housing 10 is disclosed, providing a sump for a volume of lubricant, which insures lubrication of all driving parts that are disposed either wholly or partially within said lubricant. In the present instance, the gear housing 10 has a cover 11 capable of detachable relationship therewith. However, when said cover is in its proper position it provides a substantially oil-tight enclosure for the lubricant contained in the sump.

The gear housing is fashioned to support a horizontally disposed drive shaft 12, which in turn, through the worm gear 13, transmits power to gears, not shown, which operate the driving mechanism for the washing machine, also not shown.

Bearing supports 14 and 15 are shown for the horizontal drive shaft 12, and a ball bear-

ing thrust bearing is shown at 16. Fixedly attached, as at 17, to the inwardly projecting end of the horizontal shaft 12, is a gear 18. The housing 10 provides at 19 a bearing support for the lower end of a vertically disposed drive shaft 20 for the centrifugal extractor, not shown, there being disclosed, however, a portion 21 of the bottom thereof. The vertical drive shaft 20 finds its upper bearing support at 22 in the upper portion 23 of the gear casing cover 11.

The vertical drive shaft 20 has power transmitted thereto from the horizontal drive shaft through the before-mentioned gear 18, the same meshing with a gear 24 rotatably mounted upon the drive shaft 20. Means for clutching the gear 24 to the vertical drive shaft is provided in a clutch member 25. Means for moving the clutch 25 into and out of engagement with the gear 24 is not shown, the same being of conventional construction and forming no part of the present invention.

The vertical drive shaft 20 is hollowed, as at 26, to receive an absorbing wick 27, extending substantially throughout the length of the vertical drive shaft. The drive shaft 20 has, adjacent its upper and lower bearing surfaces, and upon its exterior surface, the spirals 28 and 29 respectively, said spirals in both instances being adapted, due to such spiraling, to force the lubricant downwardly. The spiral 28, formed upon the exterior part of the lower end of the drive shaft, is adapted to force the oil downwardly to such point below the drive shaft that same will be transmitted to the wick, which will become saturated, and carry the lubricant upwardly and internally of the vertical drive shaft to a point above, where same, by centrifugal force, will be thrown against the upper bearing 22 for the upper end of the drive shaft. The oil thrown upon the bearing 22 will be forced by the spiral formation upon the upper end of the drive shaft downwardly and thus over the entire bearing surface, to a point therebelow where the oil will be thrown out into the upper part of the gear casing and thus fall into the sump portion before described.

Means for transmitting the oil from the sump to the lower bearing is provided in the opening 30, wherein the oil flows by gravity to the lower bearing, at which place it is picked up by the spiral fashioning 28 and forced downwardly therefrom to the lower end of the absorbing wick 26.

With respect to the operation of the lubricating device, it might be stated that by gravity the oil flows from the sump to the external surface of the lower bearing and therefore the spirals force the oil over the bearing surface and finally to the lower end of the absorbing wick, whereupon the oil moves upwardly by absorption to substantially the upper end of the vertical drive shaft and is thrown by centrifugal force against the upper bearing, and thereafter carried downwardly again by the spiral formation 29. The upper bearing is therefore completely and continuously lubricated, and the oil thrown off into the upper part of the housing member, where it drops again into the sump, the cycle thereafter continuing as long as there is rotation of the vertical shaft.

As respects the application of this lubricating device to a combined washing machine and centrifugal extractor, it might be stated that such lubricating mechanism will obviate the necessity of service to the vertical drive shaft, such service to a rather similar vertical shaft in machines on the market at this time having been so great as to cause considerable resistance to the sale to dealers of this type of machine, inasmuch as the replacement of the vertical drive shaft, after a short period, is necessary, due to insufficient oiling. The same can be removed and replaced only at considerable expense.

Applicant feels that by his simple method of lubricating the bearing surfaces of his vertical drive shaft, he has overcome the main objection to this type of machine, and that the same can be safely marketed by the dealer with the minimum amount of service that ordinarily accompanies a well built washing machine of conventional type.

What I claim is:

In a device of the class described, in combination, a housing member providing an oil sump, a vertically disposed drive shaft, bearing supports for said vertical drive shaft including one bearing disposed above the normal oil level in the sump and one below the normal oil level, means for continuously oiling the upper bearing comprising an oil lubricating member disposed centrally of the vertical drive shaft, an oil delivery groove on the exterior surface of the lower end of the vertical shaft for feeding oil to the lubricating member, and mechanism for forcibly returning the oil from the upper bearing to the oil sump, said means including an oil delivery groove on the exterior surface of the upper end of the vertical drive shaft.

In testimony whereof I have hereunto affixed my signature.

MARK A. DEFIBAUGH.