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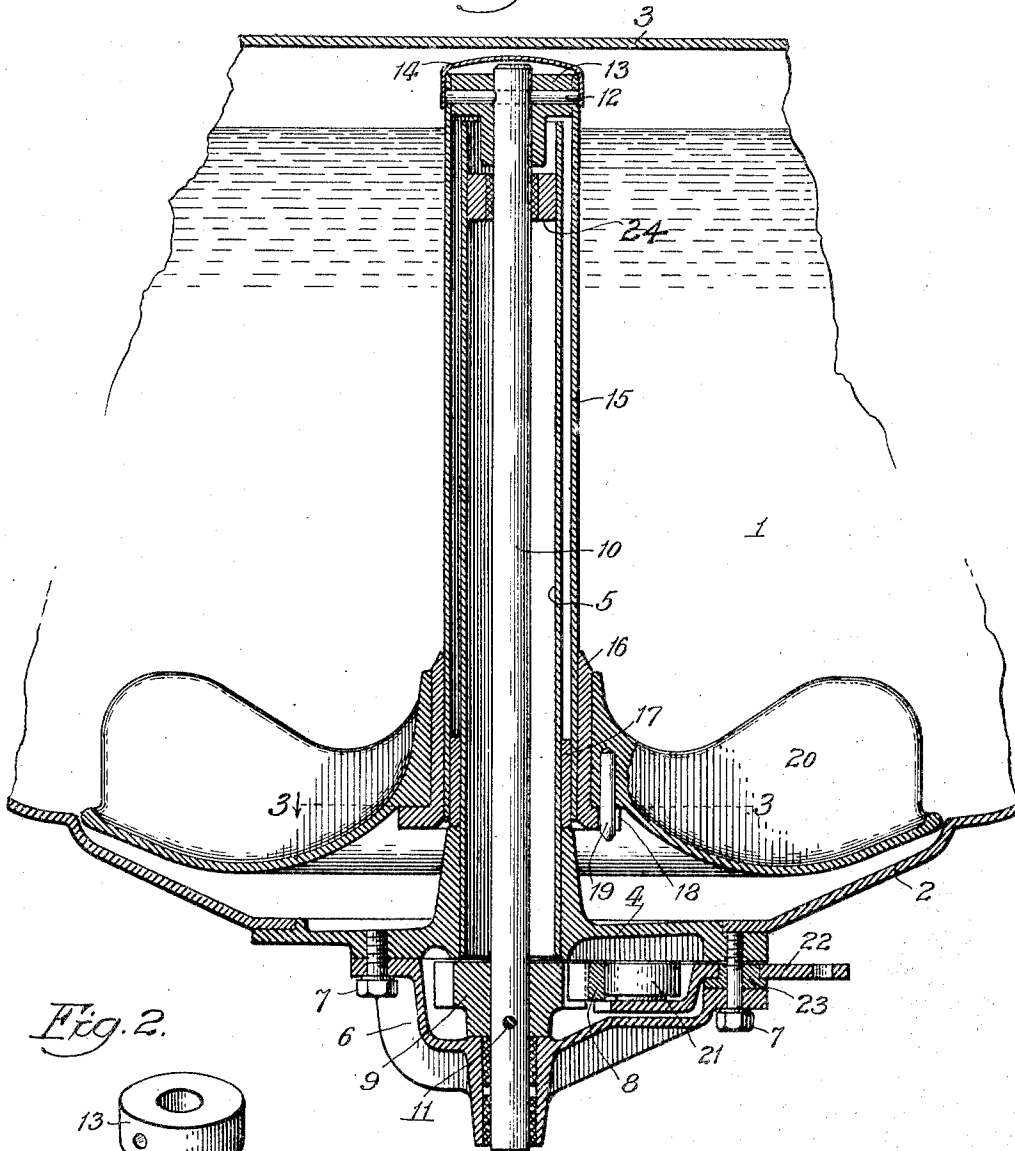
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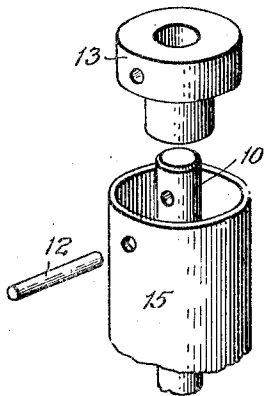
WASHING MACHINE

Filed March 25, 1926

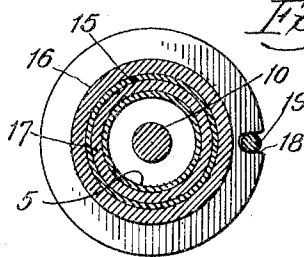
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



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# UNITED STATES PATENT OFFICE

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## WASHING MACHINE

Application filed March 25, 1926. Serial No. 97,176.

The present invention relates to a washing machine of the type whose driving mechanism extends upwardly through the bottom of the tub.

5 Among the objects of this invention is to produce a washing machine having a driving mechanism arranged to prevent leakage through the bottom of the tub.

10 Another object of this invention is to produce a liquid impelling member or liquid impeller of the type shown in my copending application, Serial No. 568,158, filed June 14, 1922, and so combined with a high center drive as to give efficient operation and yet  
15 permit the quick and easy detachment of the liquid impeller from the upstanding parts without the removal of the latter.

20 Another object of this invention is to provide a washing machine which is durable in construction, efficient in operation, and economical in manufacture.

25 Another object of this invention is to provide a washing machine having a substantially silent driving mechanism with an adjustment to compensate for wear and to eliminate noise.

Further objects, advantages and capabilities will later become more readily apparent.

30 My invention further resides in the combination, construction and arrangement of parts illustrated in the accompanying drawings, and, while I have shown therein a preferred embodiment, I wish it understood that  
35 the same is susceptible of modification and change without departing from the spirit of my invention.

In the accompanying drawings:—

Fig. 1 is a vertical sectional view of the operating portion of the machine.

40 Fig. 2 is a disassembled perspective view showing the manner of joining the shaft 10, the head 13, and the sleeve 15.

Fig. 3 is a horizontal sectional view taken on the line 3—3 of Fig. 1.

45 Referring in greater detail to the drawings, Fig. 1 shows a tube 1 having a bottom 2 and a top 3. In an opening of the bottom a plate 4 is suitably secured and forms a leak-proof joint with the upstanding tube or sleeve 5  
50 which it supports. Beneath the plate 4 and

secured thereto is a bearing bracket 6 fastened by bolts 7. A reciprocable rack 8 engages with and drives a pinion 9 which, in turn drives the shaft 10. The pinion is secured to the shaft by the pin 11. At the top of the  
55 shaft 10, secured thereto by the pin 12, as a head 13. A cap 14 is disposed over the top of the assembly and is a protection therefor.

60 A driving sleeve 15 is engaged by the pin 12 and extends above the normal water level in the tub. The lower end of the sleeve 15 is guided on an annular bearing 17, which prevents lateral movement of the lower end of the sleeve. Positioned tightly on the lower  
65 end of the sleeve 15 is a flanged torque collar 16 which supports a liquid impeller 20 and drives it by means of the engagement of a pin 19 with the notch 18. The liquid impeller 20 is slidably removable on the collar 16, and is  
70 of the same general construction as that disclosed in my above mentioned co-pending application. It will be noted that the diameter of the aperture in this liquid impeller is considerably greater than the average diameter  
75 of the sleeve 15, this being a feature which permits of the quick and easy removal of the liquid impeller from the driving mechanism without disturbing any part of the driving  
80 mechanism. In this manner one who is not skilled in mechanical arts may readily remove and replace the liquid impeller without any loss of time or without any injury to the mechanism.

85 A roller 21 is mounted on an oscillatable arm 22 which swings about an axle 23. This arm and roller are provided as a means for urging the rack into engagement with the pinion, while the special axle 23 provides an  
90 adjustment whereby the roller may be advanced toward or withdrawn from the driving shaft 10 in its oscillatory movement by a simple adjustment of the axle 23. This member 23 has a circular exterior bearing surface on  
95 which the arm 22 swings and is itself rotatable about the bolt 7 which pierces it through a hole which is eccentrically located in the member 23. In this manner wear incident to the prolonged use of the machine may be  
100 taken up and unnecessary friction and noise

in the engagement of the pinion and rack may be eliminated.

A suitable guide bearing 24 is positioned within the upstanding tube 5 to prevent lateral motion of the shaft 10. It will be noted that the shaft 10 has an upper and lower bearing which will hold it rigidly against lateral movement, while the rotatable sleeve 15 at its upper end is indirectly guided by the bearing 24 and at its lower end by the bearing 17 against lateral movement. The pinion 9 and the housing 6 constitute the sole vertical support and bearing for the shaft 10 and the associated rotatable parts contained within the tub. This combination of bearings in the construction illustrated makes possible the provision of a driving mechanism and a liquid impeller removably secured thereto all of which may rotate freely and without any lateral vibratory movement. And while the construction of movable parts receives a very rigid support from the bottom of the tub the structure prevents any possible leakage of the liquid through the bottom of the tub into the driving mechanism. The machine described herein is not only able to thoroughly and efficiently perform the washing operation, but due to its rugged construction it is capable of handling heavy charges of material to be washed and to have a long and useful life.

Having thus described my invention, I claim:

1. In a washing machine, the combination of a tub having an aperture in its bottom, a tube mounted in the aperture and upstanding in the tub, a drive shaft passing through the tube and extending through and below the lower end of the tube, a bearing for the lower end of the shaft, a bearing between the upper end of the shaft and the upper end of the tube, a spacing member rigidly fastened to the upper end of the shaft and projecting beyond the upper end of the tube, a sleeve extending above the upper end of the tube and extending downwardly adjacent the bottom of the tub, the upper end of said sleeve being secured to said spacing member, said sleeve being spaced from the tube except for a bearing sleeve disposed between the lower exterior wall of the tube and the inner lower wall of the sleeve, and a liquid impelling member mounted on the lower portion of the sleeve for rotation therewith.

2. In a washing machine the combination of a tub, having an apertured bottom, a tube mounted in the aperture and upstanding in the tub, a shaft passing through the tube, a sleeve rigidly connected to the upper end of the shaft and closing the upper end of the tube, said sleeve having a smooth, outer cylindrical surface and having its lower end provided with an outstanding portion having a perforation, a liquid impeller having a circular bore adapted freely to fit over the

sleeve and to slide over the lower end thereof and provided with a projection adapted to interlock with the perforation whereby to drive the impeller from the sleeve while permitting the facile detachment of the impeller from the sleeve.

3. In a washing machine the combination of a tub having an apertured bottom, a tube upstanding therein, a shaft passing through the tube, a sleeve fastened to the upper end of the shaft and closing the upper end of the tub and extending downwardly adjacent the bottom of the tub, said sleeve having a smooth outer cylindrical surface and having a collar fast to its lower end, said collar having an outstanding flange formed with a slot, a liquid impeller having a circular bore and slidable endwise of the collar and sleeve, said impeller having a pin projecting from its under face adapted to project into the slot of the collar for forming a driving connection between the sleeve and the impeller.

4. In a washing machine, a tub, a tubular stand-pipe having one end fixedly supported by the bottom of said tub, a smooth surfaced tubular deflecting stem enclosing said stand-pipe, a shaft extending axially through said stand-pipe and connected with said stem so that they will rotate together, a collar tightly engaging the lower end of said stem, an agitator so supported by said collar as to be maintained in a normally fixed elevation with respect to said stem, and means preventing relative rotation of said collar and said agitator.

5. In a washing machine, a tub, a tubular stand-pipe having one end fixedly supported by the bottom of said tub, a smooth surfaced tubular deflecting stem enclosing said stand-pipe, a shaft extending axially through said stand-pipe and connected with said stem so that they will rotate together, a collar tightly engaging the lower end of said stem, an agitator having a hub engaging said collar so as to maintain the agitator in a normally fixed elevation with respect to said stem, and a member carried by the agitator and removably engaging the collar so as to normally prevent relative rotation of the collar and the agitator.

6. In a washing machine, a tub, a tubular stand-pipe having one end fixedly supported by the bottom of said tub, a smooth surfaced tubular deflecting stem enclosing said stand-pipe, a shaft extending axially through said stand-pipe and connected with said stem so that they will rotate together, a collar tightly engaging the lower end of said stem and provided with an annular flange, an agitator resting upon said flange so as to be maintained in a normally fixed elevation with respect to said stem, and a pin removably extending through said flange and engaging said agitator to normally prevent relative rotation of said collar and said agitator.

7. In a washing machine, the combination  
of a tub, a tubular stand-pipe fixedly sup-  
ported by the bottom of the tub, a smooth  
surfaced tubular deflecting stem enclosing  
said stand-pipe and concentric therewith, a  
5 shaft extending longitudinally through said  
stand-pipe and connected with said stem so  
that they will rotate together, a head secured  
to the upper end of said shaft and having an  
enlargement located above the upper end of  
10 said stand-pipe and fitting within the ad-  
jacent portion of said stem, means connecting  
said stem with said enlargement so that the  
stem and shaft will rotate together, and an  
agitator supported by said stem.

15 In witness whereof, I hereunto subscribe  
my name to this specification.

HOWARD F. SNYDER.

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