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W. K. VOSS ET AL

WASHING MACHINE

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Fig. 1.

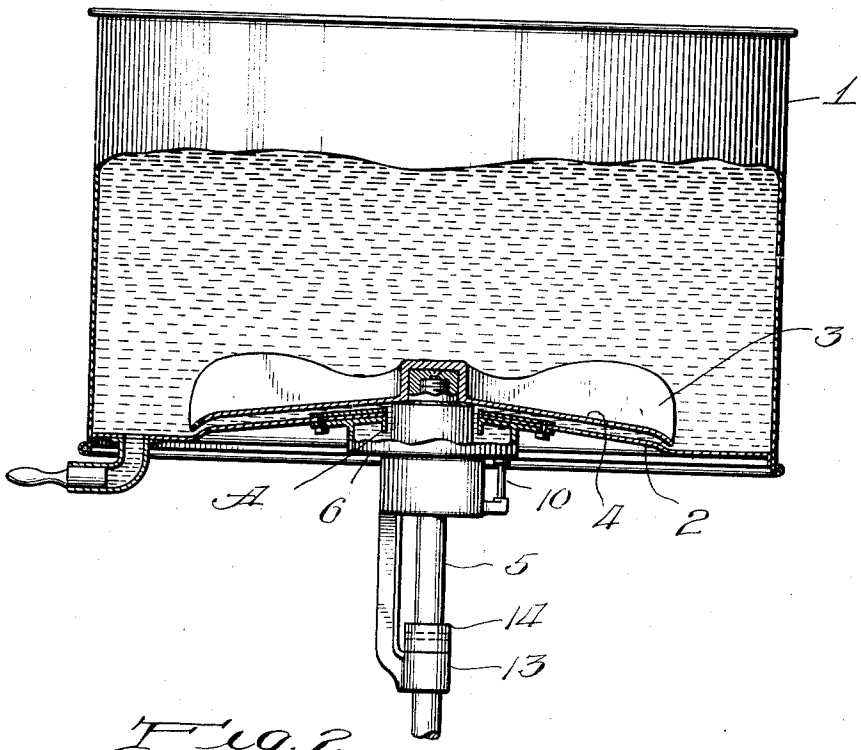
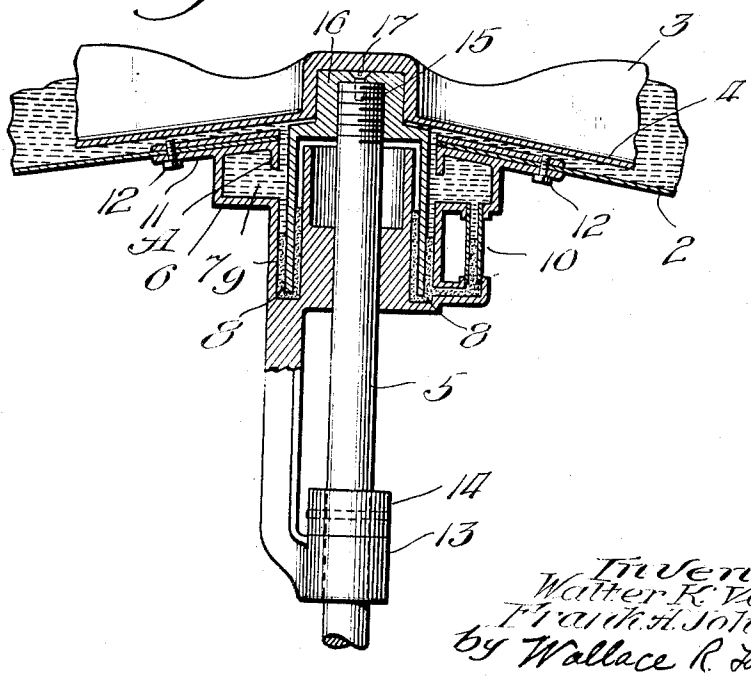


Fig. 2.



Inventors
Walter K. Voss,
Frank H. Johnson,
by Wallace R. Lane.
Atty.

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WALTER K. VOSS AND FRANK A. JOHNSON, OF DAVENPORT, IOWA, ASSIGNORS TO VOSS BROS. MFG. CO., OF DAVENPORT, IOWA, A CORPORATION OF IOWA.

WASHING MACHINE.

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The present invention relates to washing machines and more particularly to a liquid sealing device or liquid metal stuffing box for the same.

Among the objects of our invention are the following:

To provide a liquid seal that is simple in construction and requires but a small amount of sealing material.

To provide a liquid seal in a washing machine or the like that will prevent the washing fluid from leaking out of the tub or running into the operating mechanism.

To afford a liquid seal which will require no attention after being installed.

To afford a liquid seal that will not affect or mix with the washing fluid or clothes in a washing machine or the like.

To create a receptacle for the sealing material so arranged that in case a washing machine tub or the like is turned sideways or even inverted that the liquid seal would flow to its lowest point and still be contained in the receptacle chamber and not flow out of it.

To create a seal which will last an indefinite length of time.

A further object is to provide a sealing means for use in a washing machine to take place of the objectionable center pole which is now placed in the majority of washing machines to prevent the running of the washing fluids into the operating mechanism, and such other objects, advantages and capabilities as will later more fully appear.

Our invention further resides in the combination, construction and arrangement of parts illustrated in the accompanying drawing, and while we have shown therein a preferred embodiment of our invention, we wish the same to be understood as illustrative only and not as limiting the scope of our invention.

Referring to the drawings, Fig. 1 is a vertical transverse section through a tub showing our invention with the upper portion shown in elevation.

Fig. 2 is a fragmentary sectional detail showing our improved seal.

Our invention more in detail comprises a tub 1 which in ordinary use is filled with clothes, water and soap. This tub 1 has a raised bottom portion 2 and an agitator 3 constructed so that its lower face 4 conforms to the raised bottom portion 2. By this construction and cooperation of the raised bottom portion and the conforming face of the agitator, clothes are prevented from creeping underneath the agitator and interfering with the operation of our mechanism. This agitator 3 is driven by a main shaft 5 which is also to act as a holder for part of the seal mechanism which will hereinafter be set forth. A body member 6 surrounding the shaft 5 contains a receptacle 7 so that in case the tub is tipped the liquid metal or mercury used as the sealing material 8 will be held at its lowest point and retained within the receptacle. Continuing from this circular chamber within the body member 6 is a U-shaped passage 9 in which is normally located the mercury or other sealing material 8. A gauge glass 10 which gauges the level of the liquid metal 8 in the receptacle at all times is a part of the circuit of the passage 9. The body member 6 is secured to the bottom of the tub 2 by a flange 11 and bolts 12 so as to make a water tight joint at this point. A bearing 13 below a thrust collar 14 rotatably supports the shaft 5. The upper end of the drive shaft 5 is threaded as at 15 to engage the threaded inverted cup 16 with its annular depending flange, which cup is held fast thereto by a lock screw 17. This structure affords a perfect seal at this point. The head 17 of the inverted cup 16 is preferably non-circular in cross-section and removably supports the agitator 3. It will be seen that in one use of our invention the water from the tub can only pass through the passageway A until it reaches the metal seal 8 where it is stopped. This is an economical, simple and efficient means providing for positively and exactly sealing a washing machine or the like from the seeping of water into mechanism where the mechanism is likely to be damaged.

Having thus described our invention, we claim:

1. In a washing machine the combination of a tub having an opening in its bottom, a bearing attached to the tub walls about the opening thereof and provided with a central opening for a shaft and a liquid chamber concentrically surrounding said shaft opening, a shaft passing through the opening of the bearing member and projecting upwardly through the opening in the bottom of the tub, said shaft having thereon a depending circular flange having its lower end posi-

tioned in said chamber in spaced relation from the walls and the bottom thereof, and a liquid sealing medium of greater specific gravity than the water in the tub occupying the bottom of said concentric chamber and about the bottom and both sides of the depending flange whereby to seal said chamber from the passage of the water through the shaft opening in said bearing member.

2. In a washing machine the combination of a tub having a central opening closed by a depending receptacle communicating with the water in the tub and having a central opening for a shaft which opening is surrounded concentrically by an upstanding flange, a shaft passing through the opening of said receptacle and projecting upwardly into said tub above the bottom thereof, an agitator on said shaft within the tub, a circular flange carried by said shaft so as to project dependingly into the receptacle and below the upstanding flange, and mercury in the bottom of said receptacle and below the upstanding flange, said mercury in the bottom of said receptacle sealing the space between the walls of said depending flange and the walls of the receptacle and upstanding flange.

3. In a washing machine the combination of a tub having a central opening closed by a depending member forming a combined shaft bearing and liquid receptacle, said member having an outer portion forming a liquid well communicating with the tub and having an inner central aperture, a shaft passing through said aperture and projecting upwardly through and into the bottom of the tub, an agitator on the upper end of said shaft, said shaft having a circular flange depending into the well and mercury in said well sealing the passages between the flange and the sides of the receptacle.

4. In a washing machine the combination of a tub having an opening in its bottom, a member closing said opening and provided with an axial, circular flange forming a central opening and forming a concentrically surrounding well communicating with the tub and containing mercury in the bottom of the well, a shaft passing through the opening in the member and projecting into the tub, an agitator on the upper end of said shaft, and a circular flange carried by said shaft and depending into the mercury in the well.

5. In a washing machine the combination of a tub having an opening in its bottom, a member closing said opening and provided with an axial, circular flange forming a central opening and forming a concentrically surrounding well communicating with the tub and containing mercury in the bottom of the well, a shaft passing through the opening in the member and projecting into the tub, an agitator on the upper end of said shaft, a circular flange carried by said shaft and depending into the mercury in the well and means for preventing the mercury running out of the well when the tub is tipped laterally.

6. In a washing machine the combination of a tub having an opening in its bottom, a member closing said opening and provided with an axial, circular flange forming a central opening and forming a concentrically surrounding well communicating with the tub and containing mercury, the walls forming the upper portion of the well extending horizontally outwardly and thence upwardly and thence inwardly and provided with a depending circular flange whereby to provide an upper compartment to confine the mercury within the well when the tub is tipped to one side or upside down.

7. In a washing machine, the combination of a tub having a central opening in its bottom, a member depending from said tub and closing said opening, said member being provided with a circular flange providing a central opening and forming an annular well surrounding said flange and communicating with the tub, mercury in the bottom of said well, a shaft passing through the opening in the member and projecting into the tub, an annular depending flange on said shaft, said depending flange extending into the mercury in the well, an agitator mounted on said shaft, and means on said member for preventing escape of the mercury from the well regardless of the position of the tub.

8. In a washing machine, the combination of a tub having a central opening in its bottom, a member depending from said tub and closing said opening, said member being provided with a circular flange providing a central opening and forming an annular well surrounding said flange and communicating with the tub, mercury in the bottom of said well, a shaft passing through the opening in the member and projecting into the tub, an annular depending flange on said shaft, said depending flange extending into the mercury in the well, an agitator mounted on said shaft, means on said member for preventing escape of the mercury from the well regardless of the position of the tub, and means for gauging the level of the mercury.

9. In a washing machine, the combination of a tub having a central opening in its bottom, a member depending from said tub and closing said opening, said member being provided with a circular flange providing a central opening and forming an annular well surrounding said flange and communicating with the tub, mercury in the bottom of said well for providing a liquid seal for preventing escape of the washing liquid, a shaft passing through the opening in the member and projecting into the tub, an annular depending flange on said shaft, said depending flange extending into the mercury in the well, an

agitator mounted on said shaft, and a gauge glass communicating with said well for gauging the level of the mercury.

10. The combination of a liquid containing receptacle provided with an opening in its bottom wall, a chamber depending from said bottom wall, and a shaft rotatably supported concentrically with respect to said chamber and extended through said opening, said shaft having thereon a concentric flange depending into the chamber and in spaced relation with respect to the walls and bottom of said chamber, an opening being located in said chamber registering with the bottom opening of said receptacle so that liquid may flow into and fill the spaces in said chamber on both sides of said flange to provide a liquid seal.

11. The combination of a liquid containing receptacle provided with an opening in its bottom wall, a chamber depending from said bottom wall and having an opening in its upper portion, a rotatably supported flange concentrically mounted in said chamber but out of contact with the walls thereof, said openings being in register so that liquid may flow into and fill the spaces on both sides of said flange to provide a liquid seal, and a supplemental liquid seal medium in the bottom of said chamber, the last mentioned medium being of greater specific gravity than that of the first mentioned liquid.

In witness whereof, we hereunto subscribe our names to this specification.

WALTER K. VOSS.
FRANK A. JOHNSON.