

May 9, 1939.

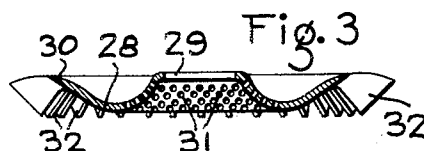
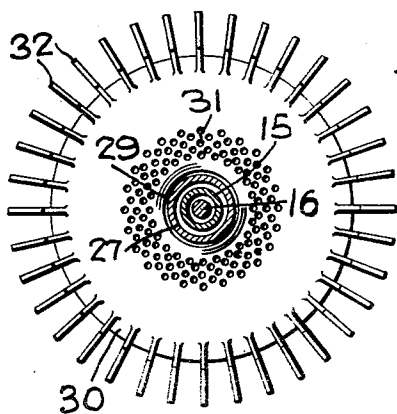
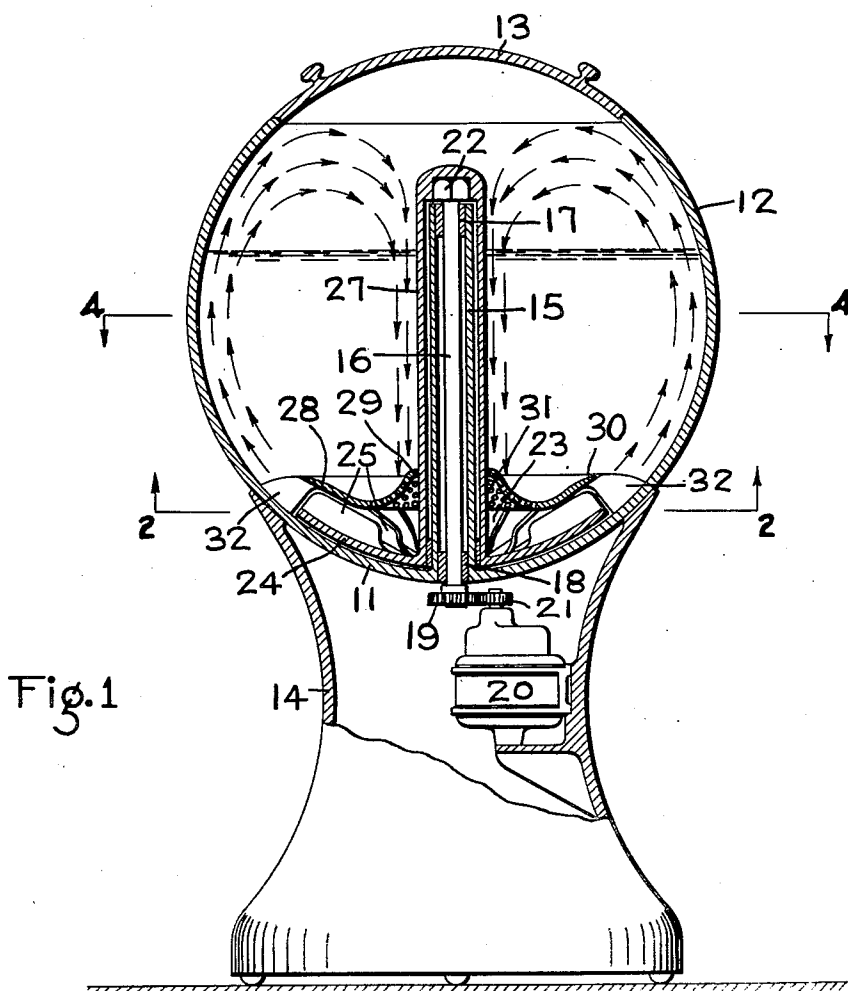
W. E. FULTON

2,157,695

WASHING MACHINE

Filed June 3, 1936

2 Sheets-Sheet 1



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Fig. 4

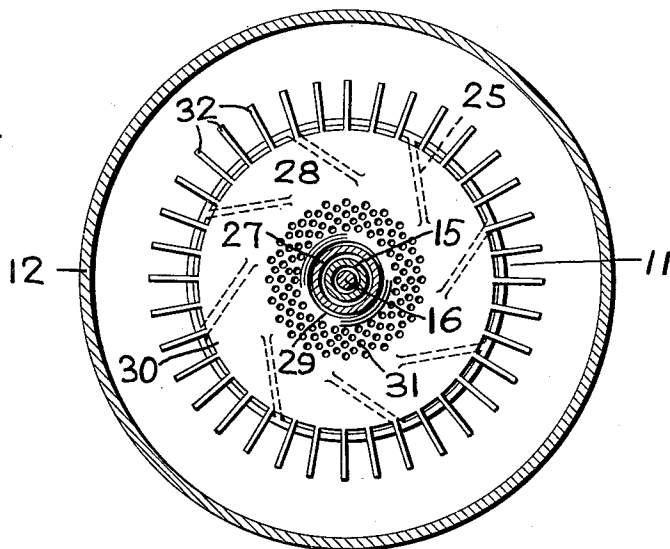


Fig. 6

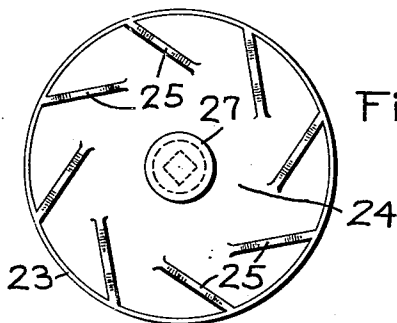


Fig. 5

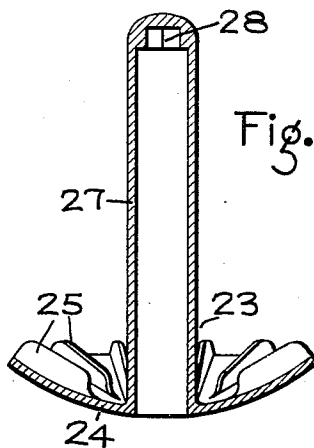
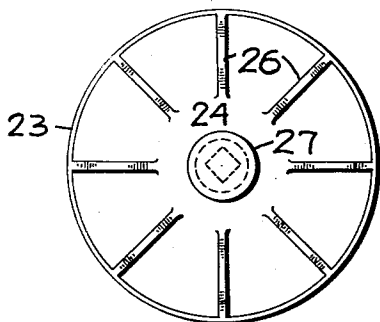


Fig. 7



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WASHING MACHINE

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Application June 3, 1936, Serial No. 83,368

2 Claims. (Cl. 68—184)

This invention relates to washing machines and particularly to washing machines that are designed to be used for laundry purposes.

An object of the invention is to provide an improved washing machine wherein the articles to be cleaned are subjected to an unobstructed, free circulation of the cleaning fluid within a substantially spherical tub having an impeller rotatably mounted in its bottom and separated from the clothing in the cleansing fluid by a stationary guard member.

Another object of the invention is to provide an improved washing machine wherein the cleaning liquid is caused to circulate radially outwardly from a central point in the bottom of the tub, then upwardly around the side wall, then across the upper portion of the tub, and then downwardly in the central portion towards the bottom of the tub.

Another object of the invention is to provide an improved washing machine of the character mentioned, which is simple in construction, and reliable and exact in function under all conditions of service.

The invention also comprises certain new and useful improvements in the construction, arrangement and combination of the several parts of which it is composed, as will be hereinafter more fully described and claimed.

In the accompanying drawings:

Figure 1 is a vertical longitudinal section of a washing machine constructed according to my present invention;

Fig. 2 is a horizontal section taken on the line 2—2 of Fig. 1, showing the impeller cover plate in inverted plan;

Fig. 3 is a vertical transverse section of the impeller cover plate;

Fig. 4 is a horizontal section taken on the line 4—4 of Fig. 1;

Fig. 5 is a vertical section of the impeller removed from the machine;

Fig. 6 is a plan of the impeller shown in Fig. 5; and

Fig. 7 is a plan of a modified form of impeller.

Referring to the drawings, the improved washing machine comprises a liquid holding tub or casing having a bottom 11, and a curved side wall 12. Adapted to be positioned on top of the side wall 12 of the tub, is a dome-shaped top or cover 13. The entire tub structure may be spherical in form, as shown in Fig. 1, for a purpose to be hereinafter more fully described.

The tub may be supported at a suitable distance above the floor by any suitable means. In

the present instance said tub is shown as being mounted upon a hollow pedestal 14.

Projecting upwardly from the center of the bottom 11 of the tub, is a tubular standard 15 which is rigidly fixed in the tub in any desired manner.

A drive shaft 16 is mounted within the tubular standard 15, said shaft being supported at its upper end by a bearing or bushing 17 and at its lower end by a similar bushing 18. The bearings or bushings 17 and 18 are fixedly mounted within the tubular standard 15.

The lower end of the drive shaft 16 is formed with a gear or other driving element 19, and said gear may be operatively associated with any suitable driving means adapted to impart a rotary motion to shaft 16 at the desired speed. In the present instance the drive is shown as comprising an electric motor 20. This motor may have a speed reducing means built therein, the shaft of which carries a gear 21 in meshing relationship with the gear 19.

The upper end of the drive shaft 16 is formed with an angularly shaped torque block or head 22, which forms a driving connection for an impeller 23.

As shown in Figs. 5 and 6, the impeller 23 comprises a bottom portion in the form of an upwardly curved plate 24 having a contour corresponding substantially to the spherical contour of the bottom 11 of the tub.

The bottom 24 of the impeller has one or more upstanding blades 25, which can, if so desired, be formed integral with the bottom 24.

As shown in Fig. 6, the blades 25 may be disposed non-radially with respect to the axis of rotation of the impeller, or, as shown in Fig. 7, said blades may be radially disposed as indicated at 26.

Projecting upwardly from the center of the bottom 24 of the impeller, is a tubular stem 27, the upper end of which is closed and formed with an internal cavity 28 adapted to receive the angular head 22 of the drive shaft 16.

Superposed above the lower portion or bottom 24 of the impeller 23, is a protector plate 28, having a central opening 29 of a size to permit the stem 27 of the impeller to pass freely there-through and to rotate without contacting therewith.

In cross section, the protector plate 28 has its main body portion somewhat concaved, with the central portion having the opening 29 located at a suitable distance above the inner ends of the impeller blades, and its peripheral portion 30

overlying the outer ends of the impeller blades, as shown in Fig. 1.

From a point adjacent the opening 29 in the central portion of the protector plate, to a point intermediate the main body of said plate, there is formed in the plate 28, a plurality of perforations 31, the purpose of which will be hereinafter described.

Projecting outwardly and downwardly from the outer periphery of the protector plate 28, is a plurality of radially disposed fins or arms 32. The lower edges of these fins rest upon the bottom 11 of the washing machine tub, and these fins have the combined function of supporting the protector plate in spaced relation with the impeller 23 and also serve as means for directing or guiding the washing liquid which is acted upon by the impeller, so that the liquid is caused to flow from the central portion of the bottom of the tub upwardly along the curved sides of the tub as indicated by the arrows in Fig. 1.

In operation, rotation of shaft 16 imparts a rotary movement to the impeller 23, so that the latter, in revolving at the desired speed in the bottom of the tub, forces the washing liquid outwardly through the spaces between the fins 32 of the protector plate 28 and against the curved wall of the tub. The impelled fluid then flows upwardly of the side wall of the tub, across the top, and then downwardly around the central upstanding column. The descending liquid upon reaching the protector plate 28, flows through the openings or perforations 31 therein, and enters the space in the tub beneath the plate 28, where it again is forced by the impeller 23 to recirculate in the same circuitous manner as above described.

One of the purposes of the protector plate 28 is to provide means for preventing the goods being washed in the tub from coming in direct contact with the impeller 23, and therefore said protector plate is so constructed as to permit the free circulation of the cleaning liquid through the tub in the manner illustrated by the arrows, Fig. 1, without permitting the goods in the liquid to be damaged by the rotating impeller 23 encased beneath said protector plate.

By constructing the tub of substantial spherical form the impeller 23 forces the liquid to circulate radially all around the tub and up the side walls of said tub. During this action, the dirt and other impurities in the goods within the tub will be quickly dislodged by the fast moving liquid. Furthermore, by providing a tub which is circular in cross section (see Fig. 4), there will be no side swirl motion of the liquid as it is being circulated through the tub by the impeller 23. In this way the machine will be quiet in operation and efficiently cleanse the goods therein.

Having thus described my invention what I claim is:

1. In a washing machine, a tub having a curved top, a curved side wall and a curved bottom, a tubular standard extending upwardly from the center of the bottom of the tub, a drive shaft rotatably mounted in said standard, an impeller having a tubular stem surrounding said standard and supported from said shaft, means for rotating the shaft and the impeller supported therefrom, said impeller having a curved bottom portion corresponding in contour to the curved bottom of the tub and a plurality of blades extending upwardly from said bottom, and a protector plate overlying said impeller and having a central perforated portion, an intermediate non-perforated portion and a peripheral portion comprising a plurality of radially disposed ribs which project outwardly and downwardly from the protector plate and surround the impeller so as to constitute means for supporting said plate in spaced relation to said impeller and means for directing the liquid circulated in the tub by said impeller upwardly of the curved side wall of the tub.

2. In a washing machine, a tub having a curved top, a curved side wall and a curved bottom, a tubular standard extending upwardly from the center of the bottom of the tub, a drive shaft rotatably mounted in said standard, an impeller having a tubular stem surrounding said standard and supported from said shaft, means for rotating the shaft and the impeller supported therefrom, said impeller having a curved bottom portion corresponding in contour to the curved bottom of the tub and a plurality of blades extending upwardly from said bottom, and a protector plate overlying said impeller and having a central perforated portion, an intermediate non-perforated portion and a peripheral portion comprising a plurality of radially disposed ribs which project outwardly and downwardly from the protector plate and surround the impeller so as to constitute means for supporting said plate in spaced relation to said impeller, and means for directing the liquid circulated in the tub by said impeller upwardly of the curved side wall of the tub and from thence downwardly towards the central perforated portion of the protector plate, as a result of which movement the body of liquid is caused to have a circulatory movement away from the bottom of the tub toward the wall of the wall of the tub, upwardly therealong toward the surface of the liquid, then in direction away from the tub wall and downwardly toward the central portion of the bottom of the tub.

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