

March 21, 1933.

F. A. HANSEN

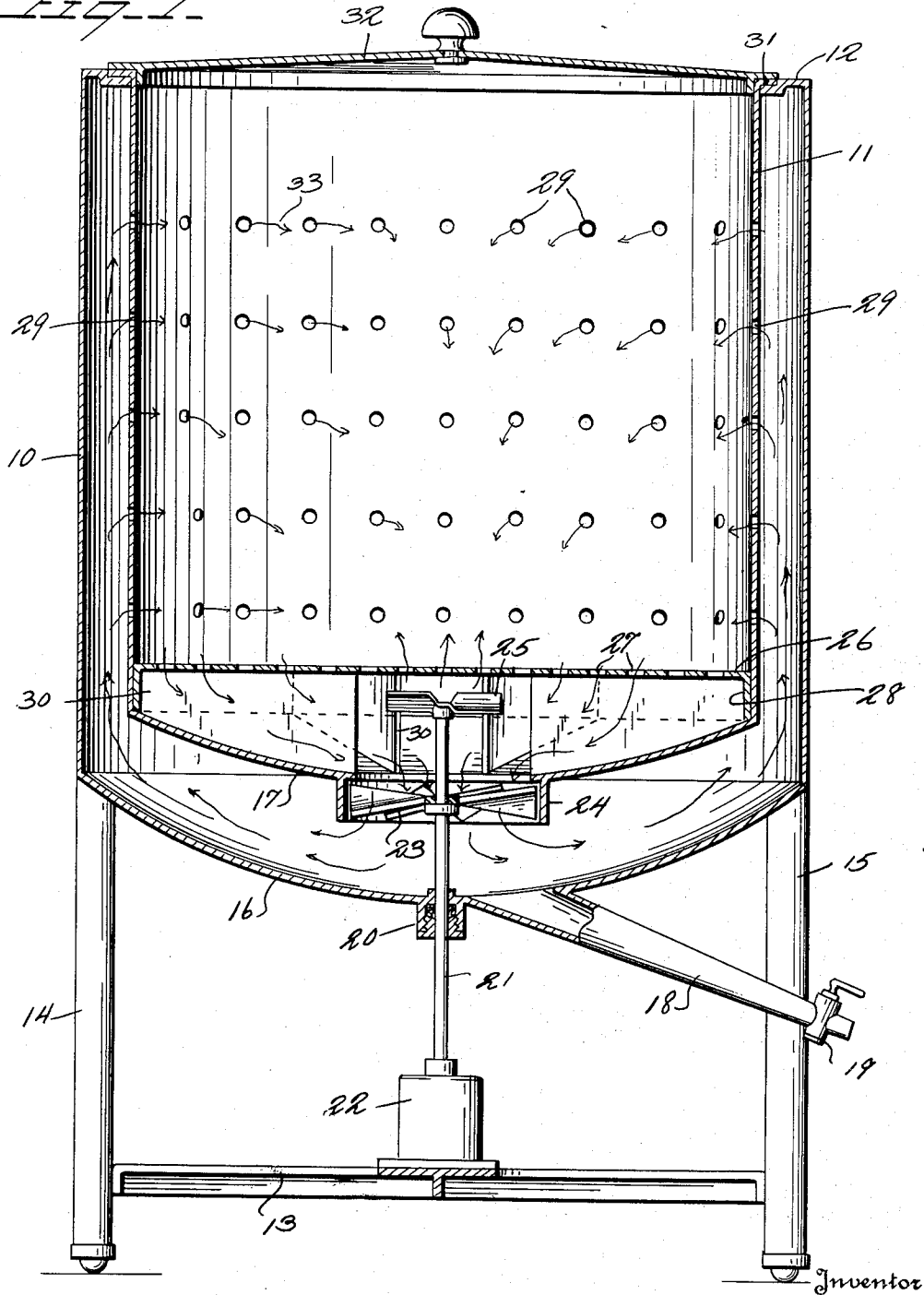
1,902,165

WASHING MACHINE

Filed May 19, 1931

2 Sheets-Sheet 1

FIG. 1



F. A. Hansen

By *Watson & Coleman*
Attorney

March 21, 1933.

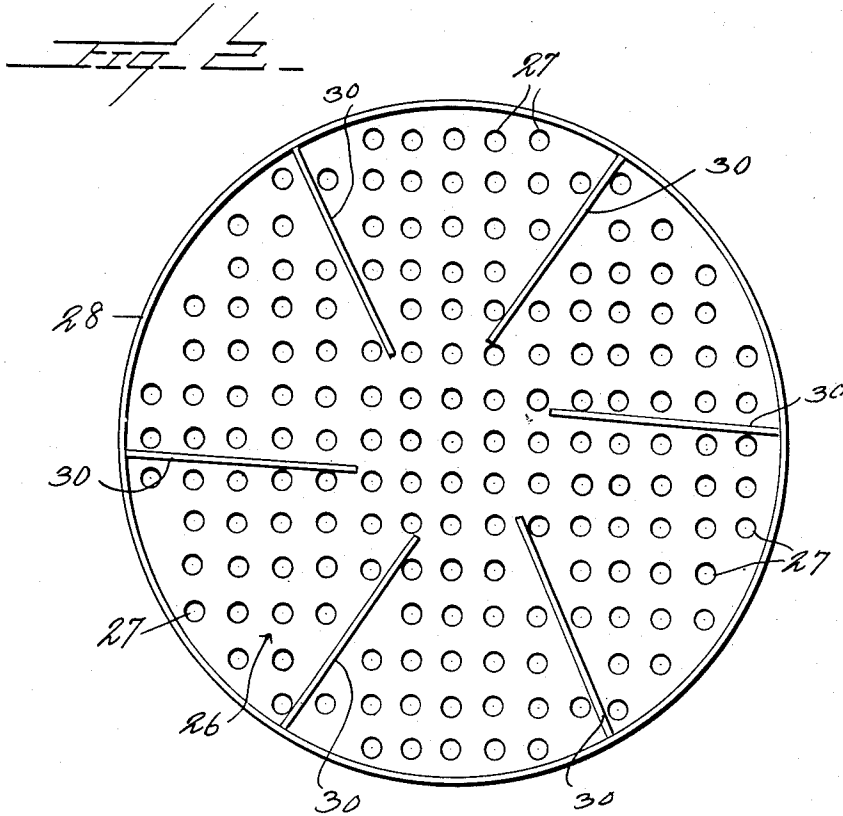
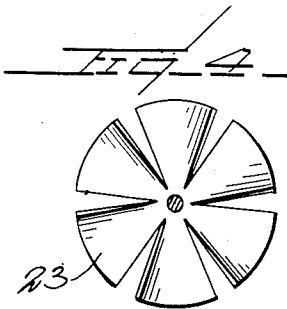
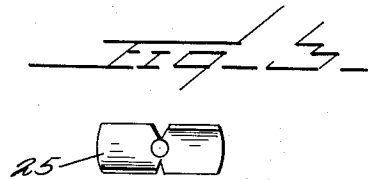
F. A. HANSEN

1,902,165

WASHING MACHINE

Filed May 19, 1931

2 Sheets-Sheet 2



Inventor

F. A. Hansen

By *Watson E. Coleman*
Attorney

UNITED STATES PATENT OFFICE

FRANK A. HANSEN, OF FERGUS FALLS, MINNESOTA

WASHING MACHINE

Application filed May 19, 1931. Serial No. 538,525.

This invention relates to washing machines, and more particularly to a machine wherein no moving part thereof contacts with articles disposed within the device.

5 An object of this invention is to provide in a device of this kind means for agitating the water or liquid within the device, so that the liquid will be forced through and about the articles disposed within the machine.

10 Another object of this invention is to provide in a device of this kind means for providing a plurality of currents of water or liquid within the device so that all portions of the article will be washed or cleansed without contact with any of the moving parts of the device.

15 A further object of this invention is to provide in a device of this kind means for preventing winding or tying of the articles with each other during the agitation thereof by the currents of liquid passing through the device.

20 A still further object of this invention is to provide a device of this kind which is so constructed that it may be used not only for the washing of fabrics, but also for dishes or the like.

25 The above and various other objects and advantages of this invention will in part be described in and in part be understood from the following detailed description of the present preferred embodiment, the same being illustrated in the accompanying drawings, wherein:—

30 Figure 1 is a vertical section partly in detail taken substantially through the center of a device constructed according to the preferred embodiment of this invention;

35 Figure 2 is a bottom plan view of the inner removable bottom;

40 Figure 3 is a plan view of the upper propeller, and

45 Figure 4 is a plan view of the lower propeller.

50 Referring to the drawings wherein like numerals of reference designate corresponding parts throughout the several views, the numeral 10 designates generally an outer tub and the numeral 11 designates an inner tub which is mounted in spaced relation to the

outer tub, being suspended therein from the top wall or portion 12. This outer tub 10 is provided with a supporting frame structure, generally designated as 14, which comprises a plurality of vertically disposed legs 15 connected together by means of braces 13 or the like.

55 These braces 13 are preferably disposed in intersecting relation between pairs of leg members 15 so that the point of intersection of the braces 13 will provide a table structure, the purpose for which will be hereinafter described. The bottom 16 of the outer tub 10 is preferably of concave formation and in like manner, the bottom 17 of the inner tub 11 is of similar concave formation. The outer tub 10 is provided with a drain pipe 18 which has a valve member 19 disposed therein so as to permit the liquids within the two tubs to be drained outwardly therefrom. The outer tub 10 is provided in the bottom 16 thereof with a bearing 20 disposed axially thereof through which a drive shaft 21 is disposed, this drive shaft 21 being connected at one end to a motor or power member 22 which is mounted on the intersecting braces 13.

60 A propeller or liquid agitator 23 is mounted on the drive shaft 21 intermediate the ends thereof and at a point upwardly from the inner surface of the bottom 16 of the outer tub 10. A depending annulus or flange 24 is secured to the inner tub 11 and is disposed about the propeller or agitator 23. At the upper end of the drive shaft 21, there is mounted a second propeller or agitator 25, the blades of which are provided with a pitch oppositely from the pitch of the propeller or agitator 23.

65 An inner removable bottom 26, which is provided with a plurality of perforations or apertures 27 therethrough, is disposed within the inner tub 11 and is held above the upper propeller or agitator 25 by means of an annulus or ring 28, which is of a diameter to loosely engage the inner surface of the inner tub 11.

70 The cylindrical wall of the inner tub 11 is provided with a plurality of perforations or apertures 29, so as to permit the passage of

water from between the inner and outer tubs into the inner tub. The inner removable bottom 26 is also provided with a plurality of fins 30 which are adapted to cooperate with the annulus or rim 28 in supporting the inner bottom 26 within the inner tub 11. The inner tub 11 may be removably supported within the outer tub 10 so as to permit ready cleaning or drying thereof, this being accomplished by providing the inner tub 11 with an outstanding ring or flange 31 for engagement with the inwardly extending flange or top 12 of the outer tub 10. The perforations or apertures 29 in the inner tub 11 preferably terminate at a point downwardly from the top of the tub, thereby providing an air space or cushion between the inner tub 11 and the outer tub 10 so as to prevent water or liquids from running out of the top thereof. A lid or cover 32 is provided for closing the upper end of the inner tub 11, this lid being adapted to frictionally engage the top of the inner tub 11 so as to prevent splashing of the liquids outwardly of this tub during the operation of the device.

In the operation of this device, the desired liquid in the form of water or suds 33 may be disposed within the inner tub 11, which water will also pass through the openings 29 and fill up the space between the inner and the outer tubs. When the motor or power member 22 is operated so as to rotate the agitators or propellers 23 and 25, the lower propeller 23 will draw the liquid downwardly of the inner tub 11 so as to force the liquid to flow as indicated by arrows in the space between the two tubs. As the water passes from the chamber between the two tubs through the apertures 29 and into the inner tub 11, the motion of the water will be a substantially horizontal motion or current. Simultaneous with the suction formed by the lower propeller or agitator 23, the upper propeller 25, the blades of which are disposed reversely from the blades of the agitator 23, will force the liquid or water in a vertical column through the apertures 27 of the inner bottom 26 and upwardly within the inner tub 11. In this manner, when the vertical column of water meets the horizontal column, the two currents of water, that is, the horizontal current of water passing inwardly through the apertures 29 and the vertical column passing upwardly within the inner tub 11, will meet and form an exceedingly agitated body of water.

Where fabrics or the like are disposed within the inner tub 11, the vertical column of water will have a tendency to force these fabrics upwardly within the inner tub, this column being disposed at substantially the center of the tub and the movement of the water adjacent the inner surface of the inner tub 11 will be a relatively downward move-

ment caused by the suction or drawing of the lower agitator or propeller 23.

Where dishes or relatively heavy articles are disposed within the inner tub 11, the vertical column of water will, of course, not agitate the articles, but the movement of the water will be the same and will wash the lower surface of the articles whereas the horizontal current formed by the water passing through the apertures 29 will wash the top and sides of the articles disposed within the inner tub 11.

It is obvious, from the foregoing, that the device hereinbefore described is capable of clearing both fabrics and solid articles in the form of dishes or the like, this being accomplished without making any change whatever in the construction of the device.

It is, of course, understood that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims.

I claim:—

1. A washing machine of the character described comprising an outer casing, an upright inner casing removably mounted in said outer casing and disposed in spaced relation to the inner surface thereof, said inner casing having a plurality of perforations in the vertical wall thereof, an axially disposed outlet port in said inner casing communicating with the space between the casing, a depending annular flange defining the marginal edges of said outlet port and extending into the space between the two casings, a vertically disposed drive shaft extending through said inner and said outer casings, a propeller mounted on said drive shaft and disposed within said annular flange and having a pitch to force liquid downwardly therethrough into the space between the two casings, and means to cause liquid upon being forced downwardly against the bottom of the inner casing to flow upwardly between the two casings and inwardly of the perforations in the inner casing in a horizontal direction, a second propeller mounted on said drive shaft at a point upwardly from the first propeller and having a pitch to force liquid in a vertical column within the inner casing, and means for holding articles out of contact with each of said propellers but permitting liquids to pass therethrough.

2. A washing machine of the character described comprising an outer casing, an upright inner casing spaced from the outer casing having a plurality of apertures in the vertical wall thereof, a perforated plate disposed within the inner casing and in spaced relation to the bottom thereof, said inner casing having an outlet port in the bottom

thereof communicating with the space between the inner and the outer casings, an axial drive shaft extending through the bottoms of said casings, means comprising a
5 propeller mounted on said drive shaft adjacent the outlet port to force liquid downwardly through said outlet port of said inner casing and upwardly in the space between the inner and the outer casings and inwardly in
10 the horizontal direction through the apertures of said inner casing, and a second propeller carried by the drive shaft and disposed upwardly of said first propeller beneath the perforated bottom and having the blades
15 thereof disposed on an angle whereby to force liquid upwardly through the apertures of the inner bottom.

In testimony whereof I hereunto affix my signature.

20

FRANK A. HANSEN.