Dec. 8, 1931. D. C. BRYANT 1,834,936

WASHING MACHINE

Filed Jan. 20, 1928 2 Sheets-Sheet 1

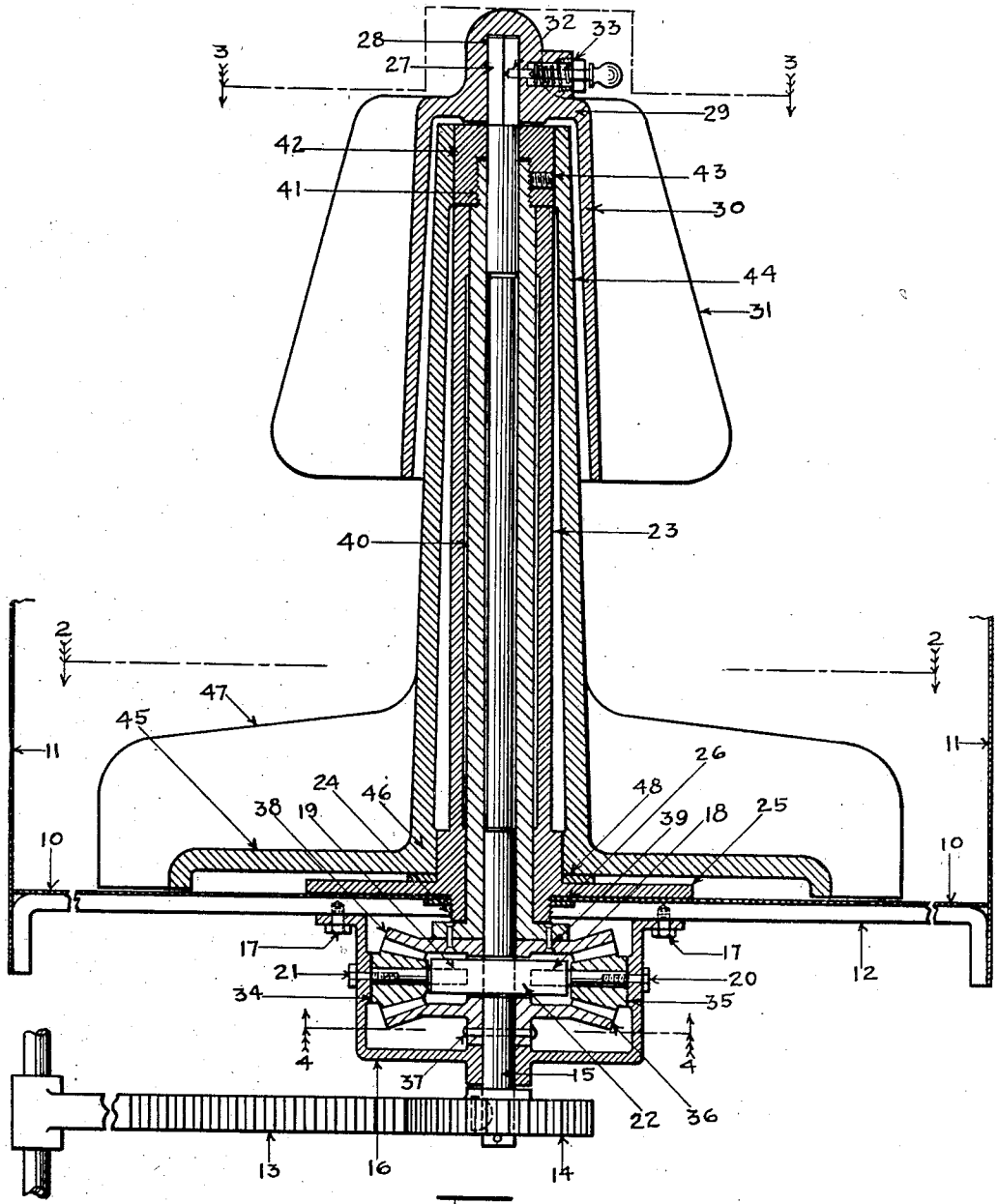


FIG.-1

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WASHING MACHINE

Filed Jan. 20, 1928 2 Sheets-Sheet 2

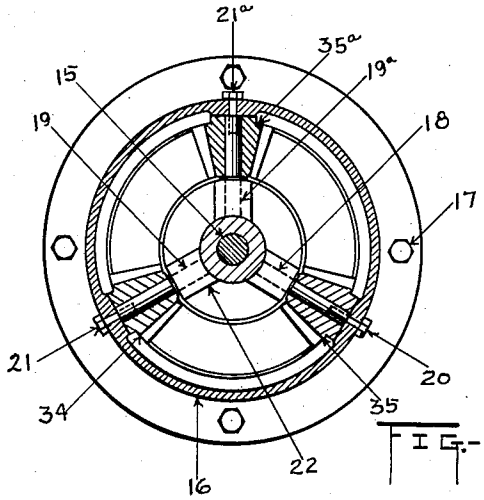


FIG.-4

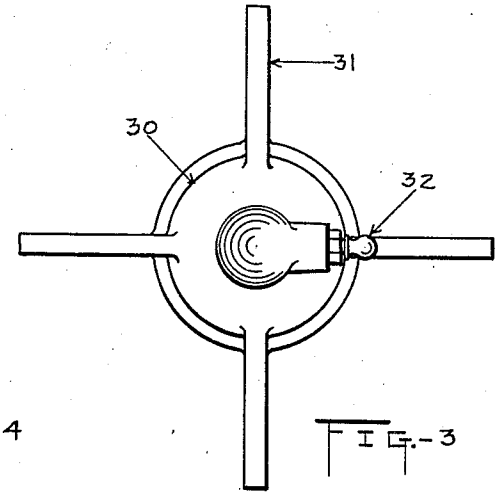


FIG.-3

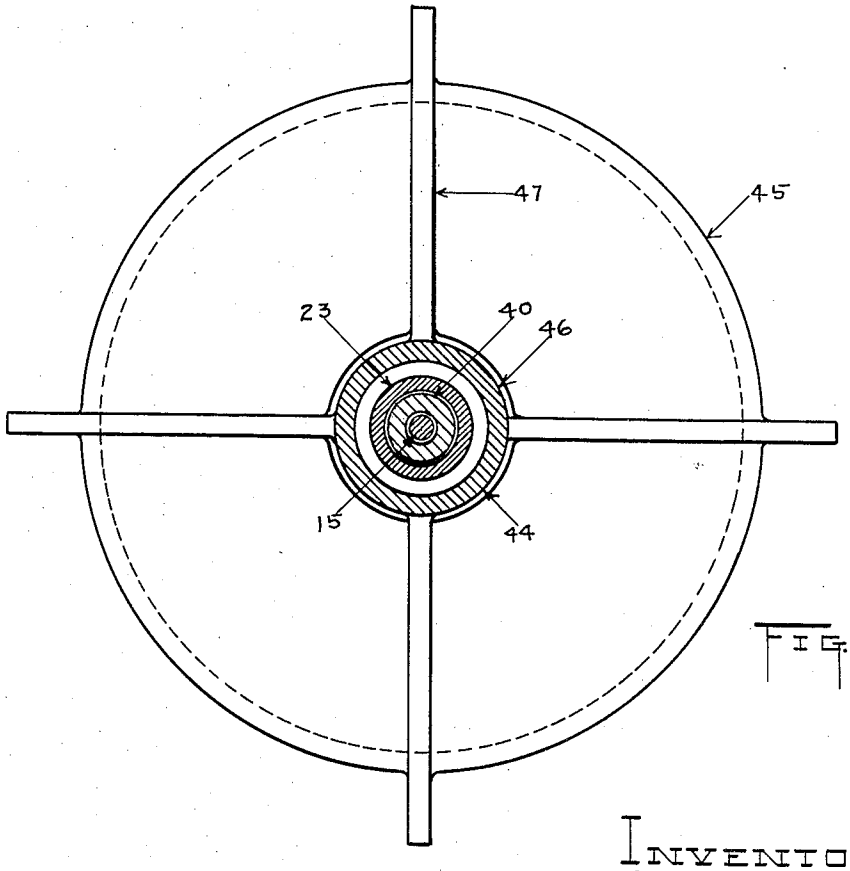


FIG.-2

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Patented Dec. 8, 1931

1,834,936

UNITED STATES PATENT OFFICE

DONALD C. BRYANT, OF NEWTON, IOWA

WASHING MACHINE

Application filed January 20, 1928. Serial No. 248,185.

This invention relates to washing machines and more particularly to a type of washing machine wherein dual agitator members are reciprocated in opposed directions within the tub.

One of the objects of the invention is in the povision of a washing machine having a tub portion in which two agitators are disposed, one adjacent the bottom and one near the top of the tub, in such manner that same will be oscillated in opposite directions, with a resulting violent water action.

Another object is in the provision of a washing machine tub wherein one agitator is disposed adjacent the bottom thereof, and reciprocated in a manner to give a vigorous water action, there being also another agitator member disposed above the first agitator member and reciprocated in the opposite direction in a manner to create a vigorous disturbance of the clothes, which may possibly accumulate in the upper portion of the tub.

A further object lies in the provision of a washing machine, including the arrangement of dual agitator members within the tub for reciprocation in opposite directions, as well as inclusion of such arrangement of drive shafts and connecting means which permit such reciprocation to be accomplished with a maximum efficiency.

A still further object lies in the provision of a washing machine including dual agitator members and an arrangement of driving means and gear mechanism which permits the above mentioned oscillation to take place with a minimum of frictional resistance as well as a minimum of parts.

Other objects will appear in the following specification, taken in connection with the annexed drawings, in which—

Fig. 1 is an elevational view, partially in section, showing the arrangement of my dual agitator members, as well as the driving and gear mechanism therefor;

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1;

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

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 1.

Before referring to the drawings, it might be stated that the present washing machine art, as well as washing machine structures which are well known in the trade, comprehend the use of a tub member and an agitator member disposed either adjacent the bottom of the tub, or, in many instances, elevated somewhat above the tube, but nowhere in the art is there found an arrangement of dual agitator members, one disposed adjacent the bottom of the tub and the other at a substantial distance thereabove, said agitators operating in different directions as respects their initial movement, thereby creating not only a distinct water action but also an additional rubbing action of the clothes, which expedites the washing operation.

Applicant herein realizes the merit of a washing machine having an agitator member disposed adjacent the bottom of the tub, which when reciprocated, due to its vigorous movement, hurls the water against the sides of the tub, then upwardly therealong, and finally again towards the center of the tub. This setting up of violent water currents in the manner described operates to wash the clothes in an efficient manner, especially if there isn't too great an accumulation of clothes in the tub. However, when the washing is large within the tub, and the agitator in this type of machine oscillated, the water action, which is very noticeable when but a few garments are in the tub, is not only greatly decreased but the clothes, which are being washed have a tendency to accumulate in a mass above the agitator and adjacent the water level in the machine, the action from then on being merely a swishing back and forth within the tub. This type of washer, as a matter of fact, is a rapid washer, but present applicant, in order to expedite further the washing action when there is a considerable accumulation of clothes in the tub assists the washing action by disposing another oscillator intermediate this mass of clothes and reciprocating same in the opposite direction, with the result that the clothes which naturally gather around the central stem, receive a vigorous rubbing action and are hurled back into the normal course of the water induced by the agitation

of the plural bladed member disposed adjacent the bottom of the tub.

In order to accomplish this efficient and speedy water action, applicant in the present instance has utilized a washing machine comprising a bottom portion 10 and side walls 11. Obviously, the tub might be of any shape or size desired and with substantially the same general action of the water. The thin bottom 10 of the tub has a sturdy framing portion 12 disposed therein and attached to the leg portions, not shown, in any manner desired.

It is thought that the washing machine art has become so well known as to obviate the necessity of complete detail showing of the legs, attachment means, etc. Similarly, with respect to the power drive, applicant has thought it necessary in the present instance, to show merely a conventional rack bar 13 meshing with a driven gear 14 which is fixedly secured to the lower end of vertical drive shaft 15.

In the present instance, a gear housing 16 is secured at the plural points 17, to the before mentioned frame 12 in a manner to house completely the mechanism, causing the reverse action of the water agitating elements. This housing is adapted to maintain a suitable amount of lubricant therein, and thus prevent the necessity of continuously oiling the moving portions. This housing also forms a bearing for the lower end of the vertical drive shaft 15, as well as a support for the pins or pivots 18, 19 and 19*a*, which are secured to the housing by means of the bolts 20, 21 and 21*a*, respectively, at their outer ends, said pins projecting at their inner ends into a stationary member 22, through which the drive shaft 15 is adapted to project and rotate. The drive shaft 15 obviously receives its rotation from the gear 14 reciprocated by the rack 13, said drive shaft projecting through the bottom center of the tub and reaching to a point above the normal water level in the tub. This vertical drive shaft lies within a column 23 which, as may be clearly seen, is threaded as at 24 in the framing portion 12, which underlies the thin bottom of the tub. This column 23 has laterally projecting bracket portions 25 adjacent the bottom of the tub and adapted to overlie same in a manner not only to support the column, but also to operate in connection with some water-sealing element, such as 26, to prevent leakage of the water from the tub through the opening in the bottom center thereof.

As stated before, the vertical drive shaft projects upwardly and centrally of the column 23, its upper end 27 being fashioned so as to be received in a similarly shaped opening 28 in the upper end of an upper agitating element, which is made up of the following parts. The upper portion 29 has integrally formed therewith and projecting downwardly therefrom a sleeve portion 30 having laterally projecting therefrom the plural wing members or clothes-rubbing ribs 31. These wings 31 act not only as a means for agitating the clothes but also the water, inasmuch as it is contemplated that the water level in the tub will at least approach the top of these wings. Means for securing the upper water agitating blade to the drive shaft is accomplished by means of a manually operable lug 32, spring tensioned as at 33 in such manner as to prevent complete withdrawal, but merely allow withdrawal of the inner and operating end of the lug from the similarly shaped aperture in the upper end of the drive shaft. Obviously, manual withdrawal of the lug will permit vertical removal of the upper water-agitating member.

Having described the upper water agitating element and mechanism for accomplishing its reciprocation, description will now be given of the lower agitating member.

Rotatable about the pivot pins 18, 19 and 19*a* are bevel gears 34, 35 and 35*a*. These bevel gears mesh with the teeth on a lower gear 36, pinned as at 37 to the vertical drive shaft 15. Reciprocation of the bevel gear 36 will result in movement of the bevel gears 34, 35 and 35*a*, with a consequent reciprocation of an overlying and similar gear 38, which in turn is pinned at the plural points 39 to the upwardly projecting pipe 40, surrounding the before mentioned vertical drive shaft 15. This pipe 40 lies between the vertical drive shaft, and the before mentioned column 23, the same following the vertical drive shaft to a point adjacent its upper end, and as a matter of fact, somewhat above the column 23, the upper end of said pipe being threaded as at 41 in a manner to receive a lug 42 which is not only threaded to the upper end of the pipe 41, but also fixedly secured thereto by means of set screw 43. The upper end of the column 23, as well as the upper end of the vertical drive shaft, acts as a bearing support for the pipe 40. The lug 42, which is secured fixedly to the upper end of pipe 40 is shaped to receive in a fixed manner, but permitting vertical removal therefrom the second sleeve 44 surrounding the before mentioned column 23 and projecting downwardly and finally merging into a flat disk 45. This disk lies adjacent the bottom of the tub, as may be clearly seen in Fig. 1 of the drawings, the inner portion 46 thereof bearing against an outwardly projecting portion of the column 23, which forms a bearing for the lower end of the disk and preventing lateral movement. Upon disk 45 are disposed plural water agitating means 47 of sufficient height and projecting outwardly sufficiently that when agitated they will create a violent lateral projection of the water.

A washer 48 surrounding the column 23 at its lower end and lying upon the brackets 25 elevates the disk sufficiently above the bottom of the tub as to permit unrestricted reciprocation, but also preventing any of the clothes content from gathering beneath the agitator.

As respects the description of the structural features, and particularly the plural water agitating elements, it is thought sufficiently clear, with the possible exception of the gear mechanism, which oscillates the water-agitating blades in opposite directions.

Description has now been given of the lower gear 36 and the upper gear 38 as exactly similar, as well as the plural bevel gears between these two gears. These bevel gears are spaced, as may be clearly seen in Fig. 4, in a manner to permit ready movement of the various parts, with a minimum of friction, these bevel gears, however, transmitting a reverse action to the upper gear from that of the lower gear. When one traces the movement of the gears in Fig. 1, it will be apparent that the movement of the lower gear will result in the movement of the upper gear in the opposite direction, with a resultant difference in direction of the movement of the upper and lower oscillator. Although obviously both agitators reciprocate back and forth, nevertheless when we consider the two agitators at the commencement of their initial operation, we find that one moves in one direction and the other in an opposite direction. As stated before, this difference of movement results in a greater turbulence of the water, as well as increasing the speed of the washing operation.

What I claim is:

1. A washing machine comprising a tub member having an opening in its bottom center, a column sealing the opening in the bottom of the tub and projecting to a point above the normal water level therein, a drive shaft projecting through the bottom of the tub to a point above the normal water level, a water agitator secured to the upper end of the drive shaft in a manner to oscillate about the upper end of the column, means for oscillating the drive shaft, a second pipe surrounding the vertical drive shaft and lying within the column projecting to a point above the column, a second water agitating member disposed adjacent the bottom of the tub and having a sleeve portion projecting upwardly and connected to the upper end of the before mentioned pipe, and gear mechanism cooperating with the gear mechanism for reciprocating the upper agitator, but operating in a manner to reciprocate the lower agitator in a reverse direction.

2. A washing machine comprising a tub having an opening in its bottom center, a column projecting upwardly within the tub to a point above the normal water level and operating as a means for sealing the bottom of the tub, a drive shaft within said column, a plural vaned water agitator attached to the drive shaft at the top of the tub to agitate the contents of the tub immediately surrounding the upper end of the column, power means for oscillating the drive shaft, a second plural vaned agitator disposed adjacent the bottom of the tub and having a stem portion projecting upwardly therefrom, mechanism for connecting the upper end of said stem with the vertical drive shaft in a manner to permit the oscillation of the lower agitator in the opposite direction.

3. A washing machine comprising a tub member having an opening in its bottom center, a column sealing the opening in the bottom of the tub and projecting to a point above the normal water level therein, a drive shaft projecting through the bottom of the tub to a point above the normal water level, a water agitator removably positioned on the upper end of the drive shaft, spring tensioned lug means for normally securing said water agitator to the drive shaft in a manner to oscillate about the upper end of the column, means for oscillating the drive shaft, a second pipe surrounding the vertical drive shaft and lying within the column projecting to a point above the column, a second water agitating member disposed adjacent the bottom of the tub and having a sleeve portion projecting upwardly and connected to the upper end of the before mentioned pipe, and gear mechanism cooperating with the gear mechanism for reciprocating the upper agitator, but operated in a manner to reciprocate the lower agitator in a reversed direction.

4. In a washing machine comprising a tub member, a water agitator member disposed adjacent the bottom of the tub, a second water agitating member disposed a substantial distance above the first mentioned agitating member, and drive means for oscillating the agitators, means for removably securing said second agitator to a drive shaft, said means including a spring tensioned lug normally passing through an aperture in the agitator and into a recess in the drive shaft, said lug manually removable from the recess in said drive shaft to permit the agitator to be removed from the shaft.

In testimony whereof I have hereunto affixed my signature.

D. C. BRYANT.