

Nov. 12, 1935.

F. MAUS

2,021,097

WASHING MACHINE

Filed May 13, 1923

2 Sheets-Sheet 1

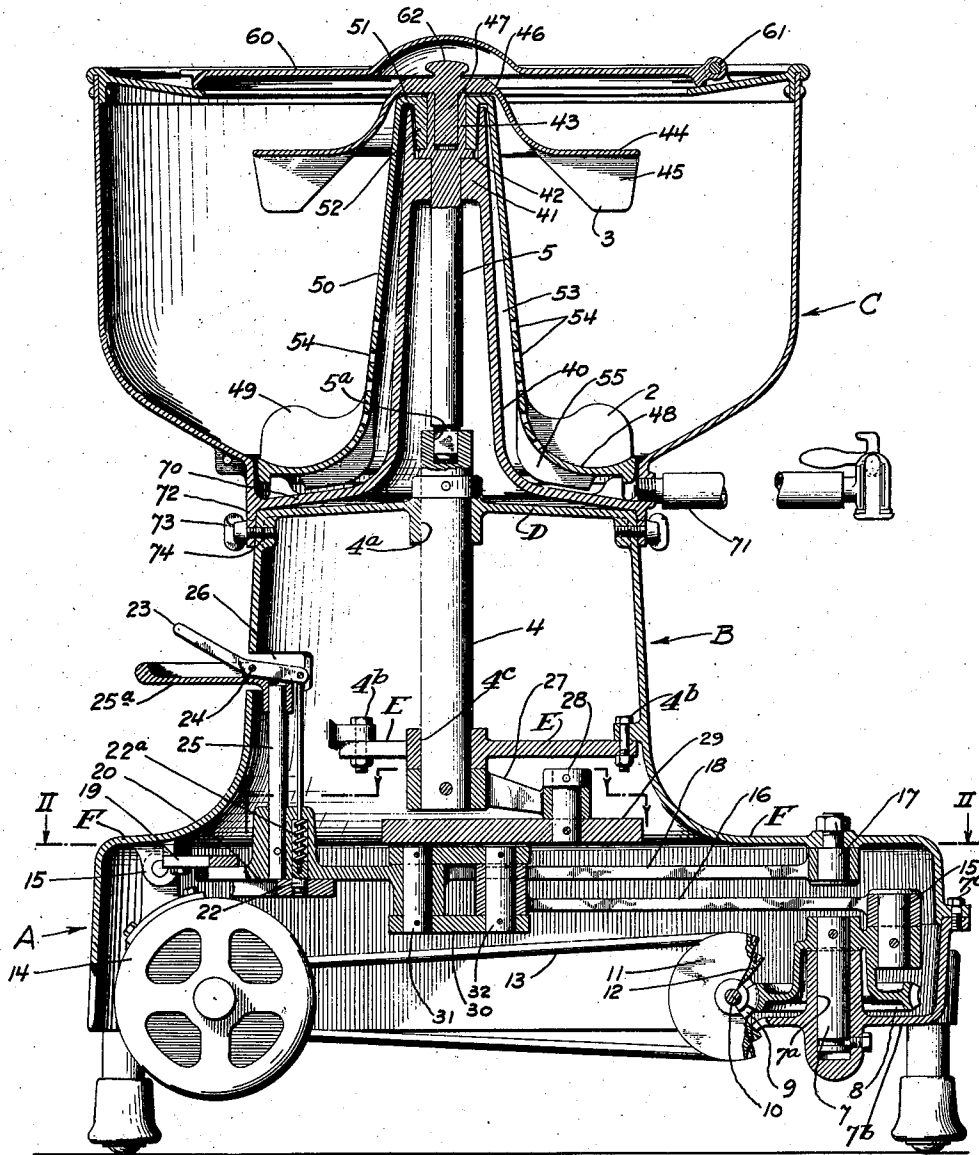


Fig. 1.

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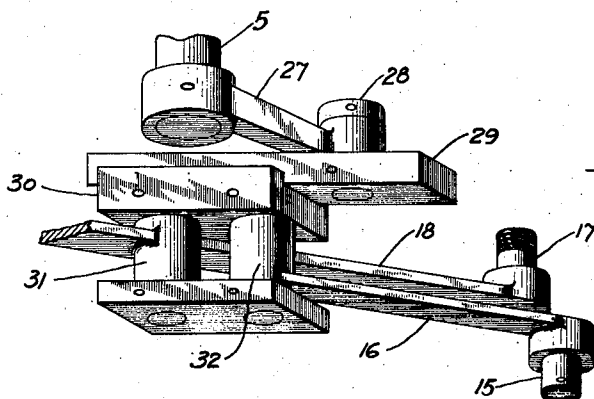
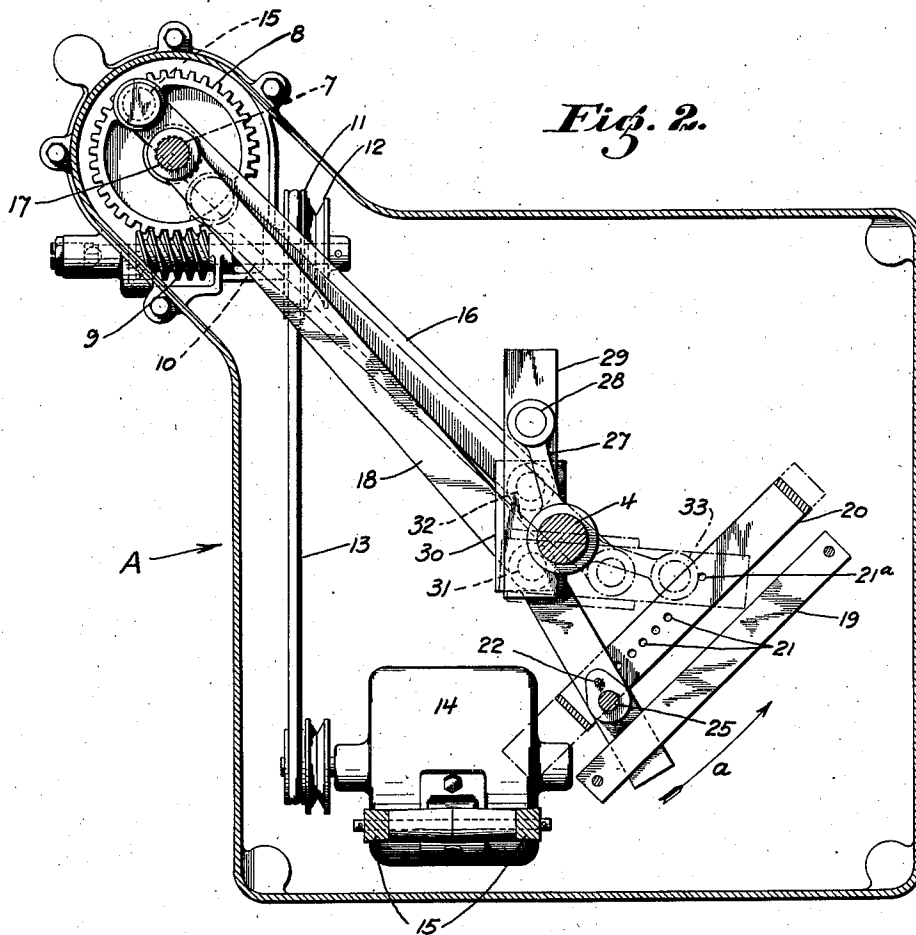
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,021,097

WASHING MACHINE

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mesne assignments, to The Apex Electrical
Manufacturing Company, Cleveland, Ohio, a
corporation of Ohio

Application May 13, 1925, Serial No. 29,904

24 Claims. (Cl. 259—101)

This invention relates to clothes washing machines and particularly to that type known as impeller washers.

The object of the present invention is to generally improve and simplify the construction and operation of washing machines of the impeller type to provide an impeller type of washer which will permit proper and efficient handling of all fabrics or clothes from the coarsest to the most delicate by providing means whereby the velocity of the water and movement of the clothes may be regulated and further to provide a washer employing a pair of superposed impellers which will prevent floating of the clothes and maintain the same within the range of action of the impellers thus insuring efficient operation.

One form which my invention may assume is exemplified in the following description and illustrated in the accompanying drawings, in which—

Fig. 1 is a vertical section of the washing machine.

Fig. 2 is a plan view in section, taken on line 2—2 of Figure 1.

Fig. 3 is a perspective view of the variable throw crank mechanism whereby a variable stroke oscillating movement is transmitted to the impellers.

Referring to the drawings in detail and particularly to Fig. 1, A indicates a base member on which is formed a vertically disposed cylindrical shaped standard B, and supported by this standard is a stationary tub or casing generally indicated at C. The base A and the standard B comprise the supporting structure of the machine. Mounted within the tub are a pair of superposed impellers such as shown at 2 and 3 whereby movement is imparted to the water and clothes to be washed. An oscillating movement is transmitted to the impellers through a pair of connected driving shafts 4 and 5, and a variable stroke oscillating movement is in turn transmitted to the shafts through a variable stroke crank mechanism which is perhaps best illustrated in Fig. 3. This variable stroke mechanism is mounted in the base portion and a detailed description thereof will now be submitted: Journalled in the base member is a vertically disposed shaft 7, secured thereon is a worm gear 8, and intermeshing therewith is a driving pinion or worm 9 which is secured on a shaft 10. Mounted on this shaft are a pair of driving pulleys 11 and 12, and adapted to drive said pulleys is a belt 13 and an electric motor 14. This motor is supported by a hanger 15 and the weight of the motor thus serves as a means for constantly maintaining the belt 13 at the proper tension. Secured on the upper end of the worm gear 8 is a crank pin 15 and connected therewith is a connecting rod 16 the function of which will hereinafter be described. Pivotaly secured to

the base member A at the point indicated at 17 is an adjusting lever 18. The opposite end of this lever is supported by a pair of cross bars 19 and 20. The bar 20 is perforated at a number of points as indicated at 21, and a locking pin 22 is adapted to enter one or another of these perforations to lock the adjusting lever at any point desired. The locking pin 22 is manually operated by a hand lever such as shown at 23, this hand lever being pivotaly supported as at 24 on a post 25 forming an extension of the lever 18. The post is also provided with a rigid hand grip 25a. The grips 23 and 25a extend through a slot 26 in the vertical extension B and they serve the function of releasing the locking pin 22 and of adjusting the position of the lever 18. The locking pin is raised by depressing the lever 23 and it is lowered by spring tension as indicated at 22a. Secured on the lower end of shaft 4 is a crank arm 27. A crank pin 28 is carried on the outer end thereof and this crank pin is pivotaly mounted in the outer end of a bar 29 which will hereinafter be referred to as the intermediate crank. A cross head member 30 engages the bar and is slidably mounted with relation thereto. This cross head member is supported by the adjusting lever 18 and is pivotaly mounted thereon at the point indicated at 31. One end of the connecting rod 16 is, as previously stated, connected with the crank pin 15. The opposite end of the connecting rod is pivotaly attached to the cross head member 30 at the point indicated at 32. The mechanism, consisting of the crank arm 27, the intermediate crank or bar 29, the cross head 30, the adjusting lever 18, and the connecting rod 16, is so connected that a variable throw crank mechanism is produced. It is capable of assuming a maximum throw position, a neutral position, and any intermediate position between neutral and maximum that may be desired. This is particularly important as it forms a means whereby the velocity of the water and clothes to be washed may be regulated as desired. The base member A and the standard B form a tub support and casing structure within which the motor driven mechanism just described is substantially concealed. Laterally extending elements or laterally extending means fixed with respect to the sidewalls of the base A and the standard B are provided for the mounting of the gearing of the motor driven mechanism. The aforesaid elements or means include a top plate D fixed with respect to the standard B. The top plate D is provided at its center with a bearing 4a for the shaft 4. This bearing is substantially coaxial with the bearing 41 provided for the upper end of the shaft 5 which is connected at 5a with the shaft 4. The shafts 4 and 5 constitute shaft means for the driving of the impellers 2 and 3. A spider having arms E is fixedly secured beneath

the plate D by any suitable means such as the bolts 4b. A bearing 4c for the shaft 4 is provided centrally of the spider in line with the bearing 4a. The base A is provided with a generally horizontal top part F integral with the base A and the standard B and which provides a support for the pivot 17 of the adjusting lever 18. The cross bars 19 and 20 and the motor 14 are also supported from the top part F of the base A. The shaft 7 of the worm gear 8 is journaled in a bearing 7a formed in a laterally extending element 7b which is fixedly secured to the base A by any suitable means such as the screws 7c.

The operation of the variable throw crank mechanism will be as follows: By referring to Fig. 2 it will be noted that the adjusting lever 18 assumes a position at one end of the supporting cross bar 20 and that the locking pin 22 is in engagement with the end-most perforation 21. When this position is assumed by the adjusting lever a maximum stroke will be transmitted through the variable throw crank mechanism; that is, the intermediate crank 29 together with the fixed crank 27 will swing from the full line position shown to the dotted line position indicated at 33. If it is desired to decrease the stroke of the variable throw crank mechanism it is only necessary to depress the lever 23 and to move the adjusting lever by means of the stationary hand grip 25a so that the locking pin may engage one or another of the perforations indicated at 21; that is, the adjusting lever is swung in the direction of the arrow a. This movement of the adjusting lever causes the cross head 30 to slide inwardly on the intermediate crank or bar 29 and as such decreases the stroke of the intermediate crank and the fixed crank 27. A neutral position will be assumed when the adjusting lever 18 reaches the point where the locking pin will engage the last perforation indicated at 21a. When this position is assumed it will be found that the pivotal connection 31 formed between the cross head 30 and the adjusting lever 18 will align with the end of the crank arm 27, or, in other words, the pin 28. The cross head together with the intermediate crank 29 will then merely swing about the pivotal points 31 and 28 and no movement will be imparted to the fixed crank 27.

The mechanism so far described relates merely to the driving mechanism whereby a variable stroke oscillating movement is transmitted to shafts 4 and 5. This variable stroke mechanism is for the purpose of transmitting an oscillating movement to the impellers 2 and 3. These impellers in turn transmit movement to the water and clothes to be washed and a detailed description of the impellers is, therefore, thought necessary. The bottom portion of the tub is provided with a central tubular extension generally indicated at 40. The upper end of this extension forms a bearing 41 for the shaft 5. The upper end of this shaft is provided with a collar 42 which rests on the bearing, and it is also provided with a socket extension 43 which is square in cross section. The upper impeller shown at 3 consists of a circular disc 44 on the under side of which is formed a plurality of radially disposed vanes 45. The center portion of the circular disc 44 is raised upwardly as shown at 46 and the under side thereof is provided with a square pin 47 which is adapted to be received by the socket 43, and as this is also square, as previously stated, a driving connection is formed between the shaft and the impeller. The lower impeller consists

of a circular disc 48. On the upper surface of the disc are formed a plurality of radially disposed vanes as indicated at 49. The central portion of the disc 48 is extended upwardly as indicated at 50 and terminates in an inwardly turned collar 51 on which is formed a downwardly extending hub member 52. This hub member has a square opening formed therein which fits over the socket 43 and as both are square in shape a driving connection is also formed between the shaft and the lower impeller. The extension 50 of the lower impeller is cone shape and it is considerably larger than the tubular extension 46 on the bottom portion of the tub. An annular intermediate chamber or space 53 is thus formed into which water is permitted to freely enter through holes or perforations such as indicated at 54. The lower or inner surface of the disc 48 is also provided with a plurality of vanes as shown at 55. These vanes serve the function of circulating the water which enters the perforations 54 and of throwing it radially outwardly so that it will continuously escape through a small annular clearance space formed between the outer edge of the disc 48 and the bottom portion of the tub. In other words, a continuous stream of water is constantly discharging around the peripheral edge of the disc 48, and this is of considerable importance as it prevents the clothing which is being washed from becoming wedged or jammed between the bottom of the tub and the impeller. Both impellers are removable, for two reasons: first, to permit ready removal when cleaning and draining the tub, and, second, for the purpose of permitting the use of either impeller or both as conditions may demand. For instance, if light clothing is being washed which has a tendency to gather air and float it is only necessary to use the upper impeller. By using the upper impeller under such conditions the clothing is maintained submerged and is also maintained within the range of action of the upper impeller. If coarse and heavy clothing is being washed, it is sometimes found that it is only necessary to use the lower impeller; and again it is found that when handling certain clothing the best results are obtained by using both impellers. To remove the impellers, it is merely necessary to raise the cover of the tub which is indicated at 60, this cover being hingedly secured at one peripheral edge as indicated at 61. When the cover has been raised it is only necessary to grasp the upper impeller by a knob such as shown at 62 and lift it upwardly. This movement will cause the central extension 47 to be removed with relation to the socket 43. When the upper impeller has been removed it is only necessary to grasp the cone shaped extension 50 of the lower impeller and to lift it out vertically. This leaves the interior of the tub free and open and it may thus be washed and drained as desired. The lower or bottom portion of the tub is provided with an annular depression adjacent to the place where the tub or casing C is engaged by the standard B of the supporting structure as indicated at 70 to make place for the impeller vanes 55. This depression also forms a final drain chamber for the wash water, and a drain pipe 71 is therefore connected with the tub at this point so that practically speaking every drop of water may be freely drained and removed. It will also be noted that the bottom portion of the tub is provided with an annular flange 72 which projects downwardly over the vertical extension B. The annular flange 72 is

provided with one or more thumb screws as shown at 73 and these may be engaged with the threaded opening 74 to secure the same. The annular flange 72 together with the locking means employed; to-wit, the thumb screws 73, permits the tub as a whole to be turned about the base to assume any position desired. This is also important as it permits the drain connection 71 to be turned to a point where the tub can be most conveniently drained and it also permits the tub to be turned so that the cover 60 will open in any direction desired. For instance, the washing machine may be placed on the back porch or in a basement at one end or another of a set of ordinary wash trays and the cover 60 should therefore swing in one direction when the washing machine is placed at one end and in the opposite direction when it is placed at the opposite end of the trays. The adjustment of the tub here shown takes care of such conditions and is for this reason important.

The foregoing description and drawings show that an impeller type of washing machine has been provided in which one or more impellers may be employed. It also shows that means are provided for regulating the oscillating movement of the impellers, thus controlling the velocity of the water and the movement of the clothes and permitting practically any clothes or fabrics to be efficiently handled without danger of tearing or destroying the same.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. In a washing machine, a stationary tub, said tub having an annular depressed recess formed in the bottom thereof, a cone shaped standard extending vertically from the center portion of the annular recess, a driving shaft journaled within said cone shaped extension, an impeller mounted in the annular depression, said impeller having a cone shaped extension surrounding the cone shaped extension on the bottom of the tub, said impeller and its cone shaped extension being interspaced with relation to the bottom of the tub and the vertical extension of the bottom to form a chamber, a driving connection formed between the shaft and the upper end of the impeller extension, said impeller being perforated to admit water to the space formed between the impeller and the bottom of the tub, and means on the impeller for maintaining the water in constant circulation through the chamber and outwardly and upwardly around the periphery of the impeller.

2. In a washing machine, a stationary tub, said tub having an annular depressed recess formed in the bottom thereof, a cone-shaped standard extending vertically from the center portion of the annular recess, a driving shaft journaled within said cone-shaped extension, an impeller mounted in the annular depression, a cone-shaped extension on the impeller surrounding the cone-shaped extension on the bottom of the tub, said impeller extension and impeller being interspaced with relation to the bottom of the tub and the vertical extension of the bottom to form a chamber and said chamber being in communication with the exterior of the impeller and its extension to permit water to enter the chamber, a driving connection formed between the shaft and the upper end of the impeller extension, and means on the impeller for maintaining water in constant circulation downwardly through the chamber and outwardly and upwardly around the periphery of the impeller.

3. In a washing machine, a stationary tub, a pair of impellers mounted within the tub one at the bottom and one adjacent the top thereof, the lower of said impellers having vanes on its upper and lower surfaces and the bottom of said tub having a recess covered by the impeller and into which the lowermost of its vanes project, drainage provisions communicating with the lower part of said recess, a tubular extension in the center of the tub and forming a part of the bottom thereof, a driving shaft journaled within said tubular extension, and a driving connection formed between the impellers and said shaft.

4. In a washing machine of the character described, a stationary tub, an impeller mounted within the tub and in the bottom thereof, said tub having a recess formed in the bottom portion for the reception of the impeller, and said impeller being interspaced with relation to the bottom of the tub to form an intermediate chamber, said chamber being in communication with the exterior of the impeller to admit water to said chamber, and means for circulating the water outwardly and upwardly around the periphery of the impeller.

5. In a washing machine of the character described, a stationary tub, an impeller mounted within the tub adjacent to the bottom thereof, said tub having a recess formed in the bottom portion which is substantially covered by the impeller to form an intermediate chamber, said chamber being in communication with the exterior of the impeller to admit water thereto, and wings on the lower side of the impeller and projecting downwardly into the chamber to circulate the water outwardly and upwardly around the periphery of the impeller.

6. In a washing machine of the character described, a stationary tub having a recess formed in the bottom thereof, an impeller mounted within the tub, said impeller consisting of a circular substantially disc-shaped member disposed above the recess to form a chamber, impeller blades on the upper surface of the disc, impeller blades on the lower side of the disc and within the chamber, said chamber being in communication with the interior of the tub both at the peripheral edge and at the inner portion thereof, and means for transmitting an oscillating movement to the disc and the impeller blades to agitate water within the tub and to maintain a circulation of water through the chamber in an outward direction around the peripheral edge of the disc.

7. In a washing machine of the character described, a disc-shaped impeller, a plurality of impeller blades formed on the opposite sides of the disc, a tub for said impeller having a recess in the bottom thereof covered by said impeller for the accommodation of the blades on the lower face of the disc, and drainage provisions communicating with the lower part of the recess of the tub.

8. In a washing machine, a stationary tub, a tubular member disposed substantially centrally thereof, said tubular member terminating at its lower end in an annular flange which is substantially horizontally disposed, impeller blades formed both on the upper and lower surfaces of said annular flange, and the bottom of said tub being formed with an annular recess covered by the flange of said tubular member and into which the lowermost of said blades project, drainage provisions communicating with the lower part of the recess of said tub, means for

transmitting an oscillating movement to the tubular member and the impellers carried thereby.

9. In a washing machine, a stationary tub, a tubular member disposed substantially centrally thereof, said tubular member terminating at its lower end in an annular flange which is substantially horizontally disposed, impeller blades formed both on the upper and lower surfaces of said annular flange, the bottom of said tub being formed with an annular recess covered by the flange of said tubular member and into which the lowermost of said blades project, drainage provisions communicating with the lower part of the recess of said tub, means for transmitting an oscillating movement to the tubular member and the impellers carried thereby, said tubular member being perforated to permit water to circulate downwardly through the tube and outwardly between the lower blades of the impeller.

10. In a washing machine of the character described, a stationary tub, a vertically disposed tubular extension forming a portion of the bottom of the tub, a driving shaft extending through said tubular extension and journaled therein, a socket member on the upper end of said shaft, said socket having a central recess formed therein which is square in cross section, and said socket presenting an exterior surface which is also square in cross section, an upper impeller having a square shaft adapted to be received by the central square opening of the socket and forming a driving connection between the shaft and the impeller, a lower impeller having a tubular extension and a collar on the upper end of said tubular extension adapted to be received by the exterior portion of the shaft socket and to form a driving connection between the shaft and the lower impeller.

11. In a washing machine, a tub having a depression in the bottom thereof, an oscillatable dasher disposed substantially centrally thereof with its axis vertical, said dasher having a circular part which extends laterally near the bottom of the tub and over the depression thereof, impeller blades formed on both the upper and lower surface of said circular part with the lower blades thereof located in the depression of said tub, means for transmitting an oscillating movement to said dasher and to the impellers carried thereby, and drainage provisions communicating with the lower part of the depression of said tub.

12. In a laundry machine, a supporting structure, a liquid holding casing engaged at its lower portion by said structure in supporting relation, said supporting structure comprising a base member with a generally horizontal wall spaced from and underlying the casing bottom and having a depending wall part around its outer edge constituting in effect a continuation of the peripheral wall of said casing, laundering instrumentalities in said casing, and power driven operating mechanism for said laundering instrumentalities carried by said supporting structure wholly beneath said casing and substantially concealed by said supporting structure.

13. In a laundry machine, a liquid holding casing, a support therefor, laundering means in said casing, and operating mechanism for said laundering means carried by said support beneath said casing, said mechanism comprising a speed-reducing gear set with a belt pulley connected to one of the gears thereof, an electric motor having a belt pulley carried by its armature shaft, a belt connecting said pulleys, and

means for pivotally hanging said motor from said support on an axis parallel to the axis of said belt pulleys and above the axis of said motor, whereby the gravitational pull of said motor on said belt is directly proportional to the pull of said belt on said motor and increases as the pull of said belt increases.

14. In a laundry machine, a liquid holding casing, a support therefor, laundering means in said casing, and operating mechanism for said laundering means carried by said support beneath said casing, said mechanism comprising a speed reducing gear set with a belt pulley connected to one of the gears thereof, an electric motor having a belt pulley carried by its armature shaft, a belt connecting said pulleys, and means for pivotally hanging said motor from said support on an axis parallel to the axis of said belt pulleys and above and to one side of the axis of said motor whereby the weight of the motor is utilized in tensioning said belt.

15. In a clothes washing machine, a supporting structure, a liquid holding casing engaged at its lower portion by said structure in supporting relation, the bottom of said casing being configured so as to define a drain trough adjacent to the place where the casing is engaged by said supporting structure, means connected to the lowermost part of the trough of said casing for controlling the draining thereof, the center of said casing having a conical raised part extending inwardly and upwardly away from the drain trough, and an agitator carried in said casing over the raised part thereof.

16. In a laundry machine, a support, a casing fixedly secured thereto, laundering instrumentalities journaled for movement about a vertical axis in said casing above the casing bottom, means located below said casing for driving said laundering instrumentalities, the bottom of said casing slanting downwardly and outwardly from its center and downwardly and inwardly from its outer edge so as to define a drain trough intermediate the center and outer edge of the casing bottom, and manually controllable drainage provisions communicating with the lower part of said trough.

17. In a washing machine a support, a liquid holding tub fixedly secured thereto, an agitator journaled for movement about a vertical axis in said tub, the bottom of said tub having a circumferentially disposed depression intermediate its center and outer edge defining a drain trough, and manually controllable drainage provisions communicating with the lower part of said trough.

18. In a laundry machine, a support, a tub fixed to said support and having a bottom resting thereon, an agitator journaled in said tub on a vertical axis and having a bottom disk recessed underneath and having its margin located close to the tub bottom, said bottom having a slant-topped elevation rising into such recess, and also an annular trough adjacent to the edge of said tub, and manually controllable drainage provisions in said trough, said trough having its outer wall slanting downwardly and inwardly outside of the margin of said agitator.

19. In a washing machine, a supporting structure having horizontal wall parts and vertical wall parts depending therefrom, a liquid holding casing engaged at its lower edge portion by said structure in supported relation, an agitator element in said casing, a centrally disposed upstanding oscillatable shaft means connected to said agitator element, said shaft means trav-

ersing a member carried by the casing bottom and adapted to prevent leakage of liquid from the casing, power driven mechanism carried by the horizontal wall parts enclosed by said supporting structure, said mechanism being operatively connected to said shaft, and control means including a manually operable handle projecting through an opening in a wall of said supporting structure for controlling the operation of said mechanism.

20. In a washing machine, a tub, an agitator therein, oscillatable shaft means connected to said agitator and traversing the bottom of said tub, a member carried by the tub bottom to prevent leakage of fluid around the shaft means at the place where it enters the tub, a supporting structure having an upper edge on which said tub is supported, and motor driven mechanism to transmit oscillating motion to said shaft means, said supporting structure having horizontal wall parts to which said mechanism is secured and a depending wall separate from the tub for hiding said mechanism, the lower edge of said wall being spaced from the surface on which the machine is resting to provide for the circulation of air about the motor driven mechanism.

21. In a washing machine, a tub, a supporting structure therefor including legs having floor contacting rollers, said supporting structure having vertically spaced horizontal portions connected to each other by generally upright side wall portions, an agitator in said tub, power driven mechanism suspended from the lower of the horizontal portions and substantially concealed by the side wall portions of said supporting structure, and shaft means connecting said mechanism to said agitator and traversing the upper of the horizontal portions of said supporting structure.

22. In a washing machine, a liquid holding tub, washing means inside said tub, shaft means traversing the bottom of said tub and operatively connected to said washing means, a tubular standard coaxial with said shaft means extending from the bottom of said tub to the upper part thereof and terminating above the normal liquid level therein for the purpose of preventing the leakage of liquid at the place where the shaft means enters the tub, a bearing at the upper end of said tubular standard for the upper end of said shaft means, an ambulant tub support and casing structure to which said tub is secured, motor-driven mechanism carried by said structure beneath said tub including gearing operatively connected to said shaft means, said structure including relatively rigid, laterally extending elements for the mounting of the gearing of said mechanism, a bearing for said shaft means carried by one of said elements adjacent to the bottom of said tub in substantial alignment with said first named bearing and cooperating therewith to provide a pair of widely spaced bearings for the shaft means, sidewalls separate from said tub, fixed with respect to said elements and extending below the tub about said mechanism and substantially concealing the same and floor engaging wheeled means for supporting said structure with the lower edges of the sidewalls thereof spaced above the surface upon which the machine is resting to provide for the circulation of air about said motor-driven mechanism.

23. In a washing machine, a liquid holding tub, washing means inside said tub, shaft means trav-

ersing the bottom of said tub and operatively connected to said washing means, a tubular standard coaxial with said shaft means extending from the bottom of said tub to the upper part thereof and terminating above the normal liquid level therein for the purpose of preventing the leakage of liquid at the place where the shaft means enters the tub, a bearing at the upper end of said tubular standard for the upper end of said shaft means, an ambulant tub support and casing structure to which said tub is secured, motor-driven mechanism carried by said structure beneath said tub including gearing operatively connected to said shaft means, said structure including relatively rigid, laterally extending elements for the mounting of the gearing of said mechanism, a bearing for said shaft means carried by said laterally extending elements adjacent to the bottom of said tub in substantial alignment with said first named bearing and cooperating therewith to provide a pair of widely spaced bearings for the shaft means, another bearing for said shaft means carried by said laterally extending elements below said last named bearing and in substantial alignment therewith, sidewalls separate from said tub, fixed with respect to said laterally extending elements and extending below the tub about said mechanism and substantially concealing the same and floor engaging wheeled means for supporting said structure with the lower edges of the sidewalls thereof spaced above the surface upon which the machine is resting to provide for the circulation of air about said motor-driven mechanism.

24. In a washing machine, a liquid holding tub, washing means inside said tub, shaft means traversing the bottom of said tub and operatively connected to said washing means, a tubular standard coaxial with said shaft means extending from the bottom of said tub to the upper part thereof and terminating above the normal liquid level therein for the purpose of preventing the leakage of liquid at the place where the shaft means enters the tub, a bearing at the upper end of said tubular standard for the upper end of said shaft means, an ambulant tub support and casing structure to which said tub is secured, motor-driven mechanism carried by said structure beneath said tub including gearing operatively connected to said shaft means, said structure including relatively rigid, laterally extending elements for the mounting of the gearing of said mechanism, a bearing for said shaft means carried by said laterally extending elements adjacent to the bottom of said tub in substantial alignment with said first named bearing and cooperating therewith to provide a pair of widely spaced bearings for the shaft means, a bearing carried by said laterally extending elements and located at one side of said last named bearing for a member of the gearing which is operatively connected to said shaft means, sidewalls separate from said tub, fixed with respect to said elements and extending below the tub about said mechanism and substantially concealing the same and floor engaging wheeled means for supporting said structure with the lower edges of the sidewalls thereof spaced above the surface upon which the machine is resting to provide for the circulation of air about said motor-driven mechanism.

FRANK MAUS.

DISCLAIMER

2,021,097.—*Frank Maus*, San Francisco, Calif. WASHING MACHINE. Patent dated November 12, 1935. Disclaimer filed February 8, 1939, by the assignee, *The Apex Electrical Manufacturing Company*.

Hereby disclaims claims 16, 18, and 20 from the specification of the said patent.
[*Official Gazette March 7, 1939.*]

DISCLAIMER

2,021,097.—*Frank Maus*, San Francisco, Calif. WASHING MACHINE. Patent dated November 12, 1935. Disclaimer filed February 16, 1939, by the assignee, *The Apex Electrical Manufacturing Company*.

Hereby disclaims claim 22 from the specification of said patent.
[*Official Gazette March 7, 1939.*]