Oct. 17, 1939. H. W. DILLON 2,176,298

WASHING MACHINE, ADAPTED PARTICULARLY FOR USE IN SO-CALLED DRY CLEANING

Filed May 23, 1935 3 Sheets-Sheet 1

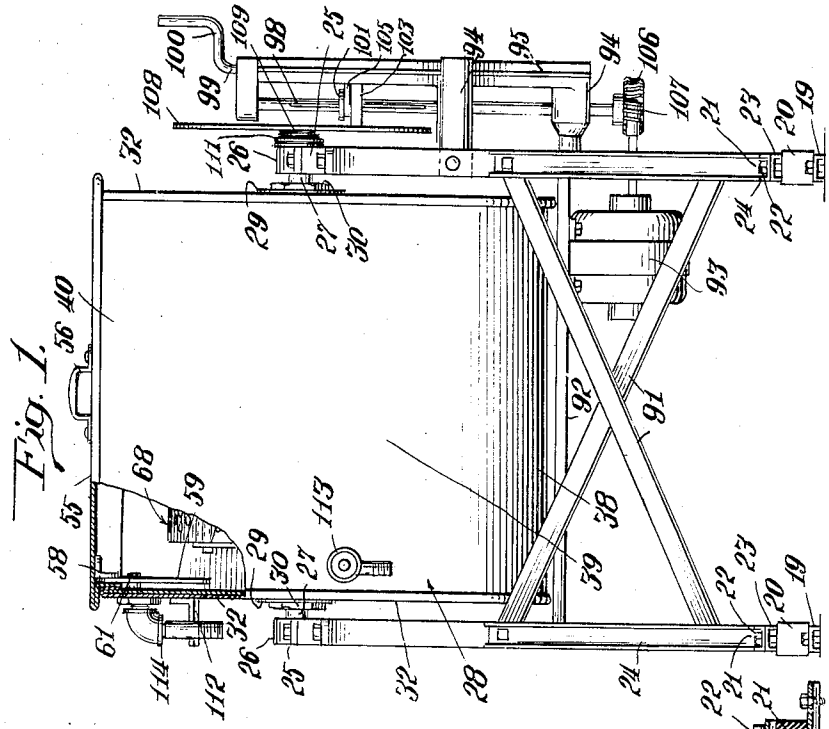

Fig. 1.

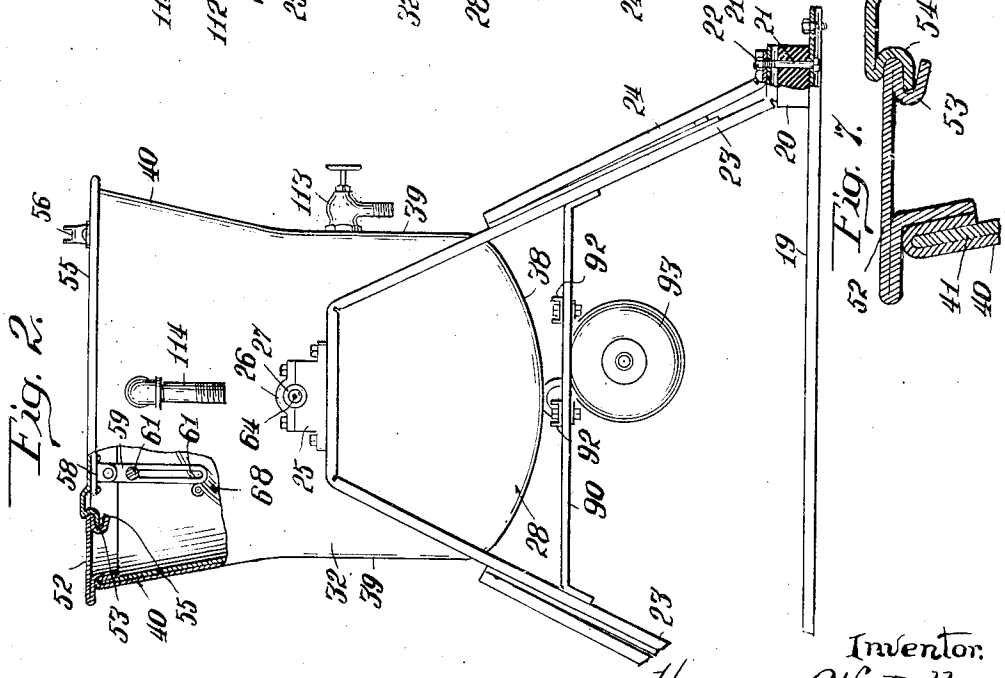

Fig. 2.

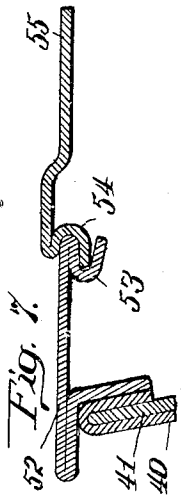

Fig. 3.

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Fig. 3.

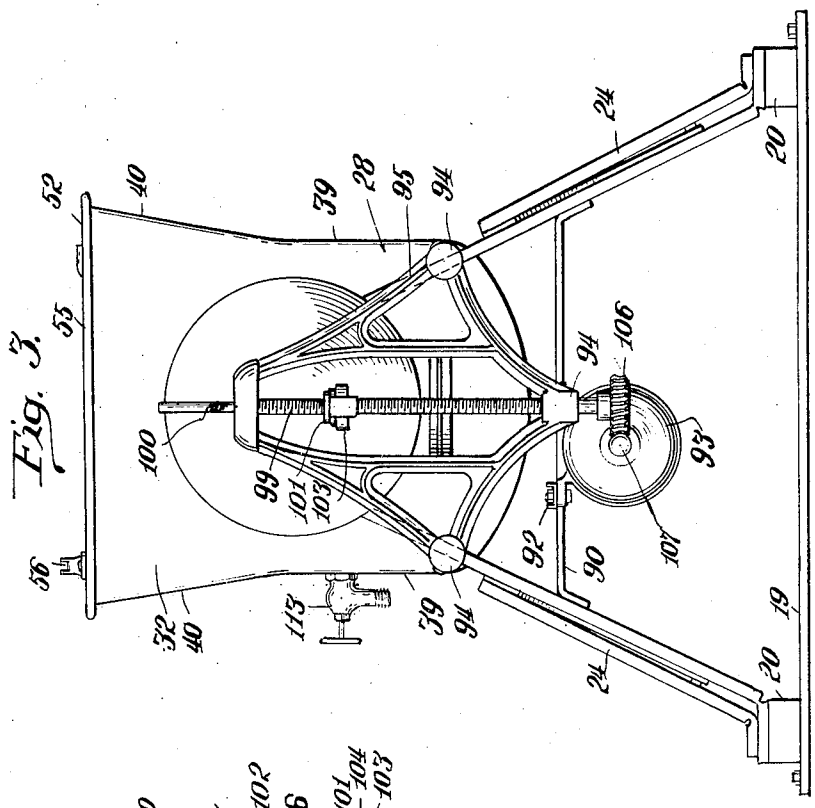


Fig. 8.

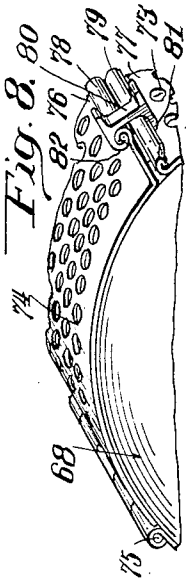


Fig. 4.

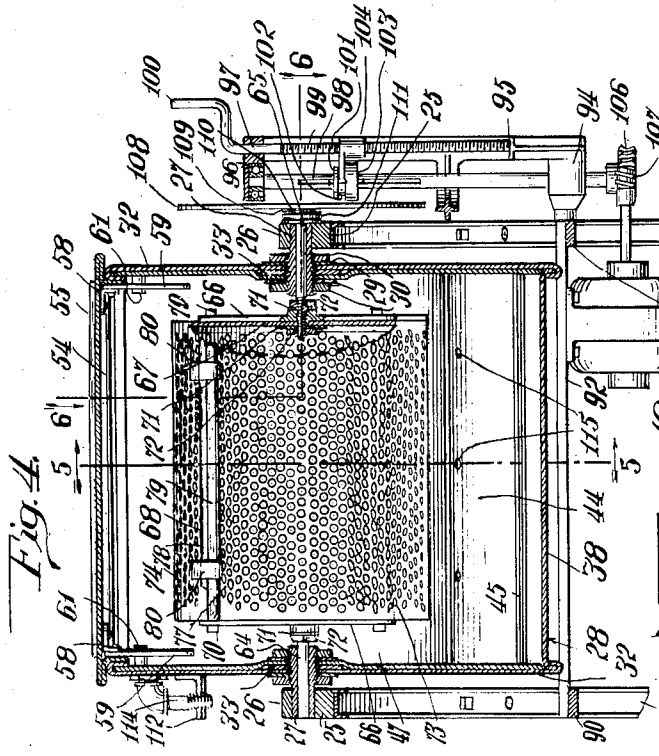
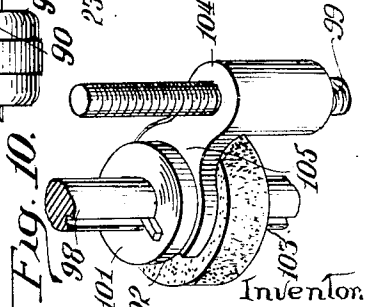


Fig. 10.



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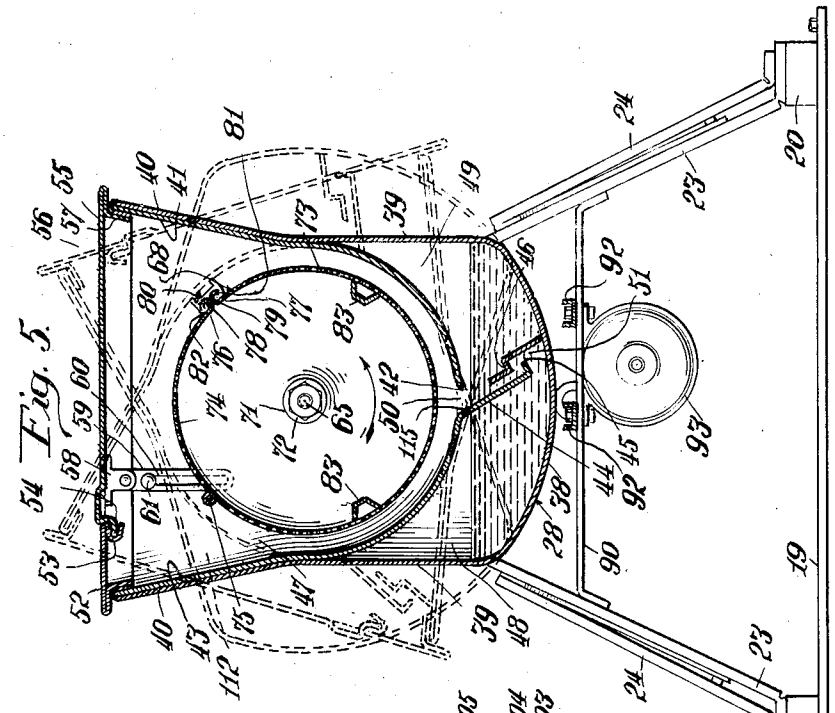

Fig. 5.

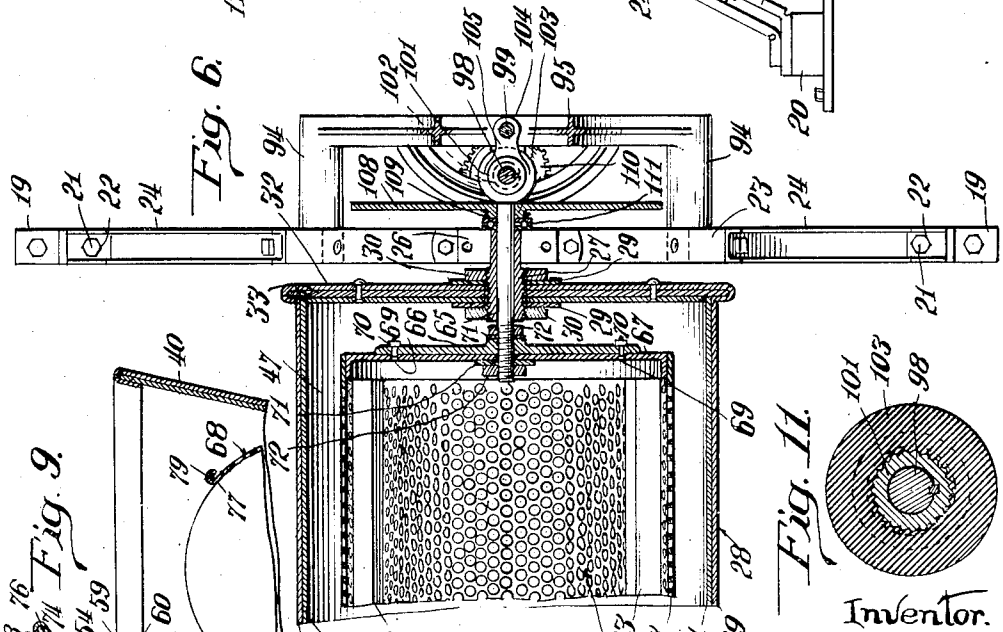

Fig. 6.

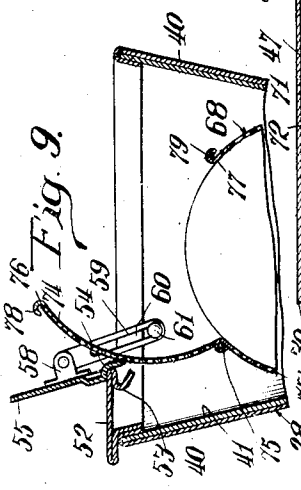

Fig. 9.

Fig. 11.

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Patented Oct. 17, 1939

2,176,298

UNITED STATES PATENT OFFICE

2,176,298

WASHING MACHINE, ADAPTED PARTICULARLY FOR USE IN SO-CALLED DRY CLEANING

Herman W. Dillon, Chicago, Ill., assignor of one-half to Thomas A. Doyle, Chicago, Ill.

Application May 23, 1935, Serial No. 22,975

2 Claims. (Cl. 68—140)

The objects of my invention are principally the following: (*a*) to provide a comparatively inexpensive machine in which both washing and initial drying can be done in a tub completely closed, without opening the tub and without handling either the fluid or the clothes or other materials placed within the tub; (*b*) to minimize and counteract vibration and its effects; (*c*) to provide reliable and easily operated locking means for the revolving basket of the machine; (*d*) to provide tight fitting, yet easily operated means for closing the main opening of the washing tub; and (*e*) to provide superior mounting and driving means for the revolving basket of the machine.

In the drawings, Fig. 1 is a front elevation of my machine, with parts of the tub broken away; Fig. 2 is an end elevation of my machine with the tub in vertical, loading and drying position, viewed from the left side of the machine, as shown in Fig. 1, likewise with parts of the tub broken away; Fig. 3 is an end elevation of my machine from the side opposite to that shown in Fig. 2; Fig. 4 is a partly sectional front elevation of my machine; Fig. 5 is a sectional elevation of my machine in the plane indicated by line 5—5 in Fig. 4, with alternate positions of the tub indicated in dotted outline; Fig. 6 is an enlarged, partly sectional top plan view of certain parts of my machine; Fig. 7 is an enlarged sectional view of certain other parts of my machine; Fig. 8 is a perspective view of still other parts of my machine; Fig. 9 is a sectional elevation of parts of my machine, showing the position of certain parts when the tub and the rotary basket therein are in open position for the introduction or removal of clothes; and Figs. 10 and 11 are detail views of certain parts of my machine.

Referring to the drawings, on inverted channel steel bars 19 and rubber cushions 20 there are mounted, by means of bolts 21 and nuts 22, legs 23, made of inverted channel bars, reinforced, in the lower two-thirds of their length, by supplementary channel bars 24, and carrying, on pillowblocks 25, bearings 26 in which are mounted tubular members 27 which are threaded into washtub 28 and are rigidly connected thereto by means of shakeproof washers 29 and locknuts 30, or other suitable means.

Tub 28 is made of suitable sheet metal, such as Monel metal, and is substantially double-walled throughout. Between the sheets forming the end-walls 32 there are interposed, penetrated by tubular axle stubs 27, reinforcing metal plates 33, extending horizontally, when the tub is in vertical position, from the front wall to the rear wall of the tub, the inner end-sheets of tub 28 being formed with suitable depressions to accommodate plates 33. The outer front and rear walls and the bottom of tub 28 are preferably formed of a single sheet of metal with a rounded bottom portion 38, parallel middle portions 39 and upwardly flaring upper portions 40. The inner front wall 41 tightly adjoins portion 40 of the outer front wall of tub 28 down to the horizontal level, approximately, of stubs 27, and thereupon continues, concentrically with stubs 27, to its free end 42, slightly to the front of the middle of bottom portion 38. The inner rear wall 43 similarly adjoins portion 40 of the outer rear wall of tub 28, then continues downward, in the same manner as wall 41, until within an inch or two of end 42 of wall 41, and thereupon slants with its portion 44 toward bottom 38, ending in an upturned flange 45 within an inch or two of bottom 38, opposite to a baffle 46 which projects from bottom 38, substantially parallel to portion 44 and flange 45. Both walls 41 and 43, and also baffle 46, are throughout their entire length from top to bottom firmly soldered or welded to end walls 32 of tub 28, thus forming within tub 28 three chambers, being chamber 47 above walls 41 and 43, chamber 48 below wall 43, and chamber 49 below wall 41 and above portion 44 and baffle 46. Chamber 49 communicates with chamber 47 through slot 50, extending between end 42 and wall 43, and with chamber 48 through passage 51, formed between the lower end of wall 43 and baffle 46,—both slot 50 and passage 51 extending the entire distance between end walls 32. At its top tub 28 is permanently closed for a short distance from its rear wall 43, by fixed cover portion 52, firmly soldered or welded to wall 43 and to end walls 32, and having its front end bent upon itself so as to form a tongue and groove edge 53, adapted to be engaged by a corresponding groove and tongue edge 54, formed in the rear end of movable cover portion 55 by a double bending, upon itself, of such rear end. Portion 55 has attached to it a lifting handle 56, is formed with downward projecting flanges 57, and is dimensioned so that when edge 53 is tightly engaged by edge 54, a pushing down of portion 55 will result into a tight engagement of end walls 32 and inner front wall 41 by flanges 57. In order to hold cover portion 55 in convenient position when edge 54 is disengaged from edge 53 and cover portion 55 is tipped upward and backward, it is provided on its lower side, adjacent end walls 32 and a short distance forward of

groove 54, with brackets 58 which carry, oscillatably joined thereto, links 59, provided with slots 60 which are in engagement with pins 61, entered in end walls 32.

In tubular members 27 there are oscillatably mounted axle stubs 64 and 65 which are threaded through the centers of disks or spiders 66 and through the vertical ends 67 of cylindrical washing basket 68 to which spiders 66 are firmly secured by bolts 69 and nuts 70, or by welding. Axle stubs 64 and 65 are rigidly held in position in members 66 and 67 by shakeproof washers 71 and locknuts 72. Ends 67 are rigidly connected with each other by a perforated cylindrical metallic member 73 which is soldered or welded to ends 67 along most of their circumferences, the cylinder being completed by a gate 74, likewise made of perforated sheet metal, which is oscillatably connected to member 73 by a rod 75 after the method commonly used in piano hinges. The free end 76 of gate 74 and the corresponding end 77 of member 73 are each curled upward and backward, forming curls 78 and 79. On curl 79 there are mounted two locking members 80 which engage curl 79 with curled projections 81 and carry similar curled projections 82 which are adapted to engage curl 78. After projections 81 are slid into engagement with curl 79, the outer ends of curl 79 are pinched together sufficiently to prevent disengagement of projections 81 therefrom, but not sufficiently to prevent free sidewise movement of members 80 on the intermediary portion of curl 79. The outer ends of curl 78 are cut away in order to make it practicable to slide projections 82 endwise into engagement with curl 78 when gate 74 is closed, thereby locking gate 74. Unlocking is similarly effected by sliding members 80 sidewise towards the ends of curl 79 as far as they will go. I have found a lock of this construction to combine reliability and ease of operation in a higher degree than any other lock I have tried out on a horizontal cylinder that has to revolve at high speed. On its inside, basket 68 is provided with one or more ribs or baffles 83, firmly attached to the walls and ends of basket 68 so as to minimize sliding of the clothes placed into the basket upon rotation of the basket. The baffle or baffles are preferably so placed as to counterbalance the extra weight added on one side to the basket by the hinges and the locks of gate 74.

Both pairs of legs 23 of my machine are additionally braced, directly above bars 19, by bars 90, the downturned ends of which are preferably welded to legs 23. Each pair of legs 23 likewise is connected to the other pair by crossbraces 91 which preferably run from the points at which the upper ends of bars 24 are attached to legs 23, to points, on legs 23, about one seventh of the length of legs 23 above their lower ends. Bars 90 are connected with each other by parallel angle bars 92 which carry an electric motor 93, provided with suitable electrical controls and connected with an appropriate power supply (not shown).

To one pair of legs 23 and the bar 90, connecting them, there are attached, preferably by bolts and nuts, three horizontal posts 94 that project from, and carry, a spider frame 95. This spider frame carries, rotatably mounted in suitable bearings 96 and 97, and secured against endwise movement by any suitable means, vertical shaft 98 and vertical screw 99, the latter provided at its upper end with a crank 100, or in lieu thereof, a handwheel. Shaft 98 carries, slidably mounted thereon, but prevented from turning thereon by any suitable means, a metal block 101 the upper part of which is formed with a circular recess 102, while its lower part is provided with vertical flutes and has firmly mounted thereon a horizontal fibre disk 103. Screw 99 carries, threaded onto it, a metal block 104 from which projects a yoke 105 that engages recess 102. At its lower end shaft 98 carries a worm gear 106, engaged by a worm on the outer end of shaft 107 of motor 93. The outer end of axle stub 65 has firmly mounted thereon, opposite shaft 98, a vertical friction disk 108 which is constantly being pushed against fibre disk 103 by a compression spring 109 of suitable strength which is mounted on hub 110 of disk 108 and bears with its other end against adjoining pillow block 25, a thrust bearing 111 being preferably interposed to reduce friction. In order that spring 109 may be effective under all conditions in pushing disk 108 into firm engagement with disk 103, basket 68 is made of such length as to afford to axle stubs 64 a reasonable amount of endwise play within members 27.

To prevent tub 28 from tipping too far to the rear, stop 112 is soldered or welded to the outside of tub 28 at an appropriate place, for engagement with one of leg braces 24 when the tub is in washing position, as hereinafter shown. For the purpose of emptying the fluid contents of tub 28, a valve cock 113 is provided on the front of tub 28, adapted for attachment of a hose. This cock is so placed as to communicate with the upper end of chamber 49. For the purpose of providing an outlet for fumes prior to the opening of the cover of my tub, another hose connector 114 is placed in the end of tub 28 opposite to the end at which its driving mechanism is located, near the top of tub 28. This connector enters tub 28 by means of a swivel joint, and the hose connected to it leads to an exhaust fan (not shown), adapted to draw fumes from tub 28. For the purpose of permitting air to escape from chamber 48 when fluid enters that chamber through passage 51, several small vents 115 are drilled into wall 43 opposite to end 42.

The method of operating my machine is as follows:

Preliminary to charging my machine valve cock 113 is closed. Cover portion 55 is then lifted at its forward end by means of handle 56 and at the same time pulled forward so as to disengage edge 54 from edge 53, and is thereupon tilted backward until the lower ends of slots 60 engage pins 61. Cover portion 55 then will be in the position shown in Fig. 9.

Basket 68 is thereupon rotated, if necessary, until gate 74 is on top. Members 80 are then pushed toward ends 67 as far as they will go, thereby unlocking gate 74. Gate 74 is then tipped upward and backward by means of curl 78, until it rests against cover portion 55. The clothes to be washed are thereupon placed into basket 68, gate 74 is closed by lowering it, and is locked by pushing members 80 towards each other and incidentally pushing projections 82 into firm engagement with curl 78. Washing fluid, such as soap water or carbon tetrachloride, is then poured into the machine in such volume, approximately, as would be sufficient to fill chamber 49 completely if all of the fluid were confined therein. Cover portion 55 is then tilted forward, and its forward portion lowered, until edge 54 is directly opposite to edge 53. It is then shoved backward until edge 54 is in tight engagement with edge 53, and

is thereupon pushed downward until flanges 57 are in tight engagement with end walls 32 and inner front wall 41.

Tub 28 is then first tipped forward until all fluid that has entered chamber 48 has run out of it through passage 51, and is thereupon quickly tipped backward until stop 112 engages the leg brace 24 located below it. By this movement practically all of the fluid in tub 28 is thrown on the top of wall 43 and into chamber 47, filling that chamber sufficiently to reach well into basket 68. Screw 99 then is turned, by means of crank 100, until disk 103 is moved, by means of yoke 105, so as to engage disk 108 near its outer circumference. Motor 93 is then started, resulting into a slow turning of basket 68, and into washing of the clothes within it by a continued tumbling of them into the fluid at the bottom of the basket. The speed of the rotation of basket 68 can be accelerated or diminished by moving, through the operation of crank 100, disk 103 closer to, or farther away from, the center of disk 108,—disk 108 continually being pressed into tight engagement with disk 108 by spring 109.

As soon as the washing is completed, motor 93 is stopped and tub 28 is tipped back into vertical position. This will cause all of the fluid in tub 28, except that adhering to the clothes in basket 68, to flow into chamber 49 and from there, in part, into chamber 48, until chamber 47 is empty and the level of the fluid is well below slot 50. Motor 93 is then started again, and disk 103 is gradually moved closer to the center of disk 108 until basket 68 revolves at high speed, thereby throwing, through centrifugal force, practically all of the fluid adhering to the clothes in basket 68, out of the basket, and causing it to run, through slot 50, into chambers 49 and 48. When this elimination or drying process has been carried out to sufficient extent, the speed of revolution of basket 68 is reduced and motor 93 is again stopped. Tub 28 and basket 68 are then opened, the clothes therein are removed, almost dry, a new batch of clothes is put into basket 68, and the same process is repeated as was gone through with on the first batch.

When a volatile washing fluid is used, the exhaust fan operating through connector 114 is operated while tub 28 is open. Likewise, there always being some loss of fluid through evaporation, from time to time additional washing fluid is put into tub 28 until the fluid therein has to be removed or needs filtering or other processing to clean it and to restore its efficiency as a washing agent. When that becomes necessary, cock 113 is opened, and tub 28 is tipped forward until all the fluid in it has run out through chamber 49 and cock 113 into the sewer or into a suitable vessel.

I desire to emphasize particularly that by the peculiar construction of my machine, including particularly the construction of the frame, its bracings and its mounting, I have succeeded in producing a machine that will stand up for a long time notwithstanding the violent vibration that will be produced by a rapid revolution of a horizontal basket that carries an unbalanced load.

It is manifest that the construction of my machine can be altered in numerous details without departure from the essentials of my invention. Thus, for instance, members 27 might be shortened, so as not to enter bearings 26, and axle stubs 64 and 65 might be directly entered in bearings 26, leaving tub 28 to ride on axle stubs 64 and 65 by means of members 27. All such alterations I intend to cover by my claims.

I claim—

1. In a washing machine, the combination of a tub oscillatably mounted on substantially horizontal tubular axle stubs; a wash basket within the tub, mounted on axle stubs oscillatably entered in the tubular axle stubs; bearings in which the tubular axle stubs are mounted; means supporting the bearings; means for rotating the basket; and partitions within the tub arranged to form a false bottom substantially concentric with the basket and having a slot parallel to the axis of the basket; and baffles extended from the slot downward and from the real tub bottom upward; substantially as, and for the purpose, described.

2. In a washing machine, the combination of a tub oscillatably mounted on substantially horizontal tubular axle stubs; a wash basket within the tub, mounted on axle stubs oscillatably entered in the tubular axle stubs; bearings in which the tubular axle stubs are mounted; means supporting the bearings; means for rotating the basket; and partitions within the tub arranged to form a false bottom having a slot parallel to the axis of the basket; and baffles extended from the slot downward and from the real tub bottom upward; substantially as, and for the purpose, described.

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