Sept. 1, 1936. A. C. SCHMELZER 2,052,666

CLOTHES RINSING AND DRYING APPARATUS

Filed Sept. 7, 1933 4 Sheets-Sheet 1

FIG. 1

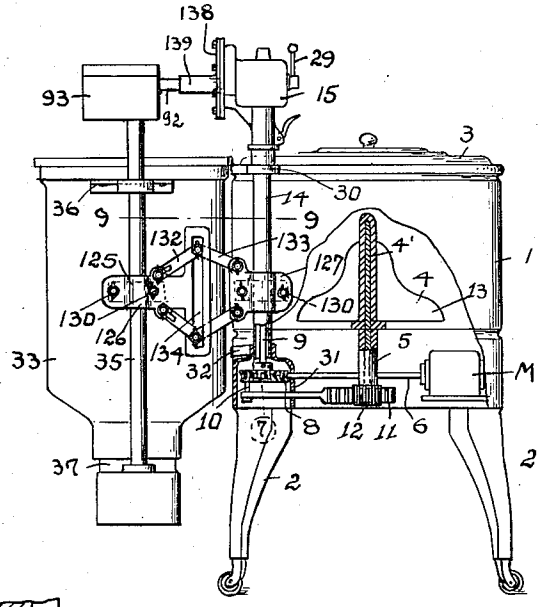
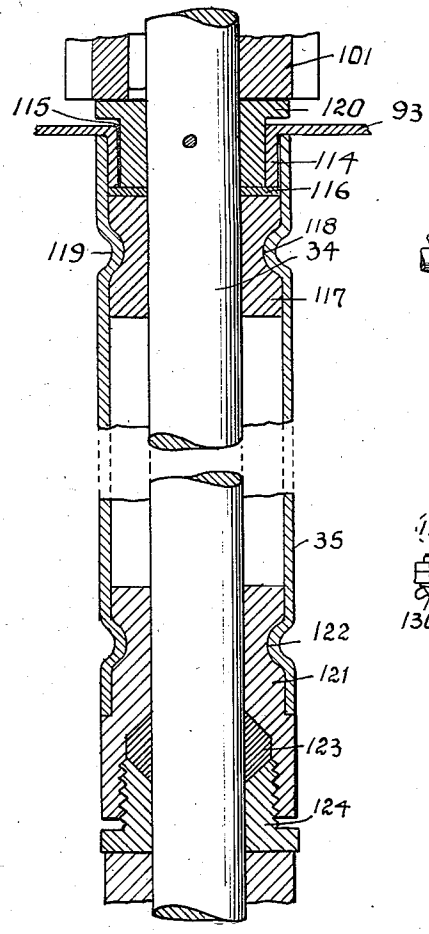


FIG. 8



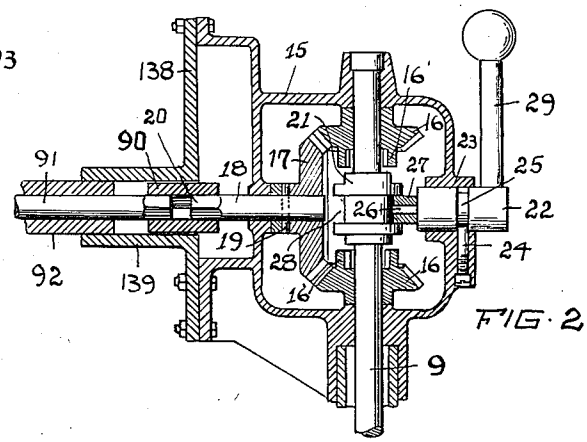


FIG. 2

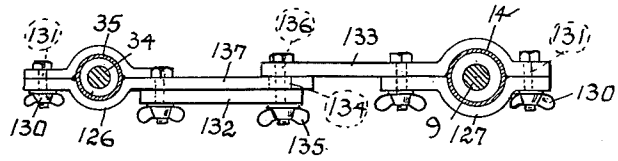


FIG. 9

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FIG. 3

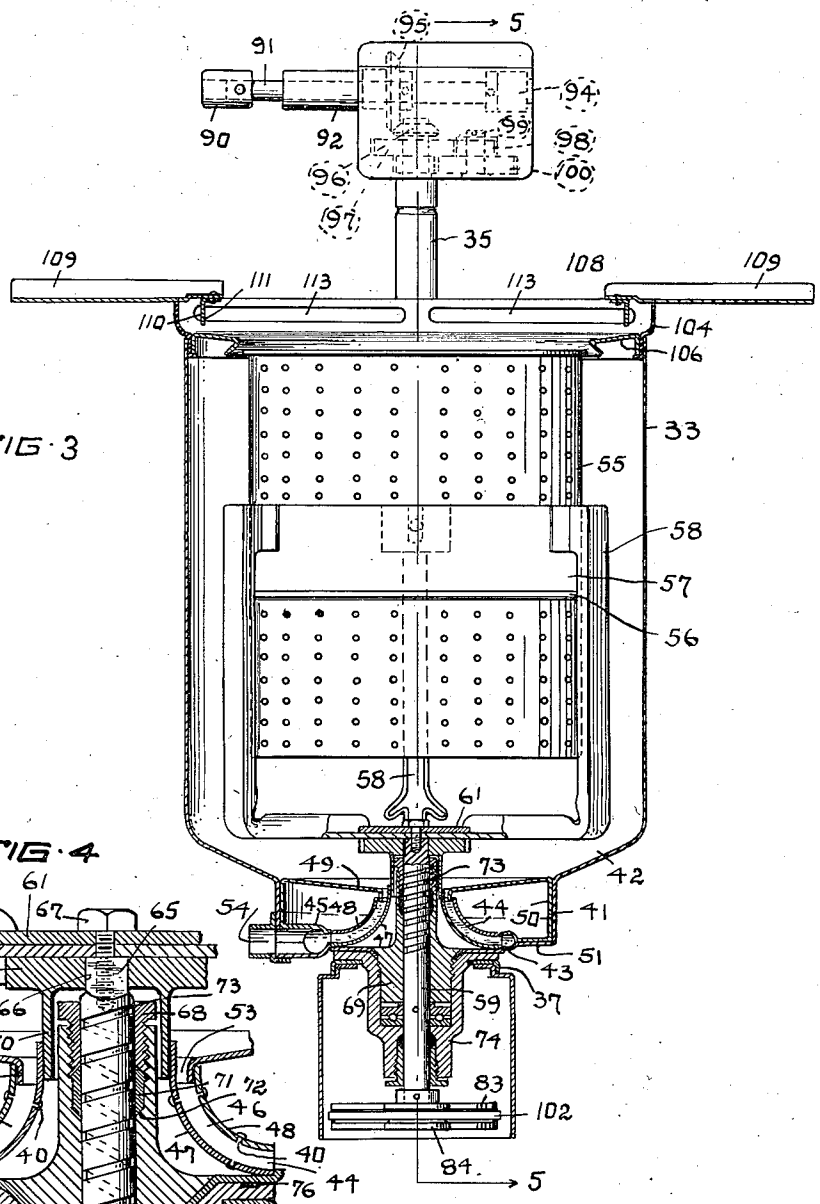
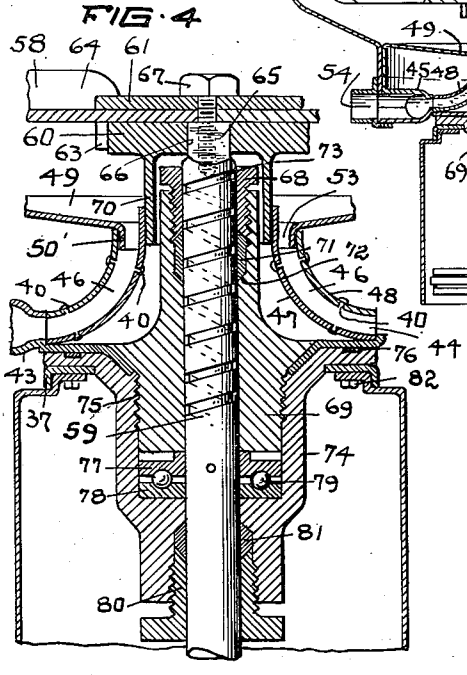


FIG. 4



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CLOTHES RINSING AND DRYING APPARATUS

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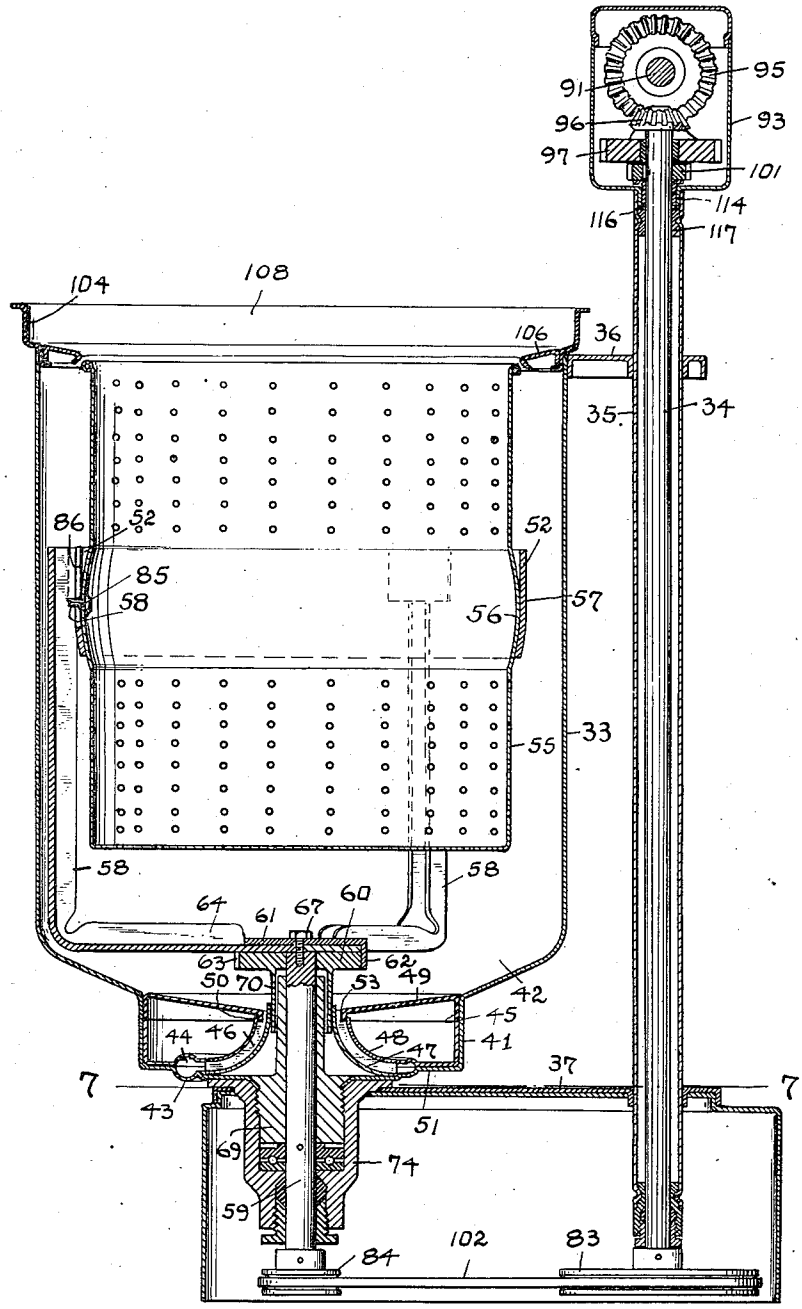


FIG. 5

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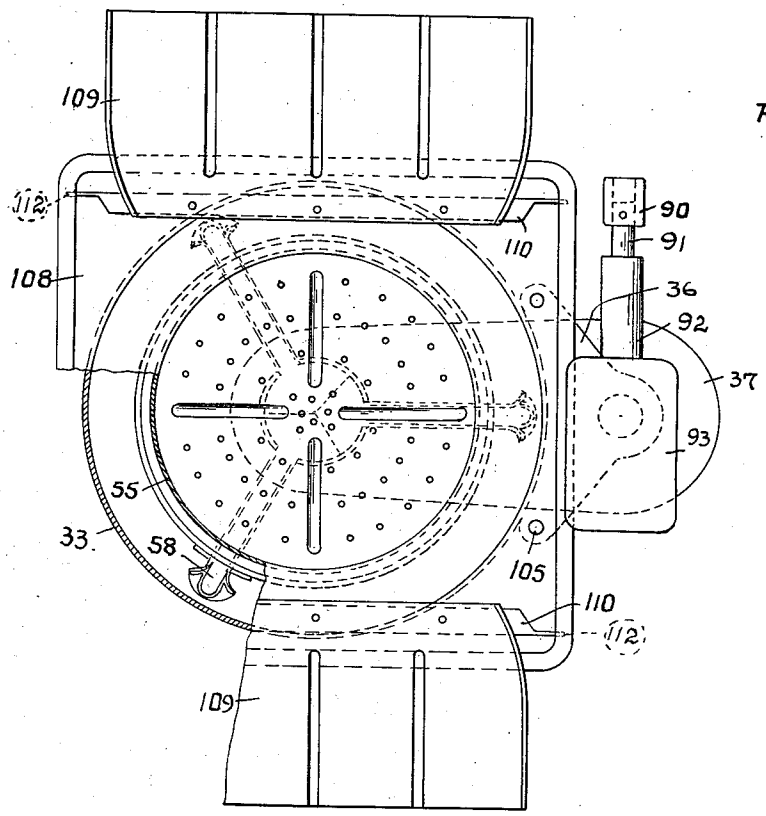


FIG. 6

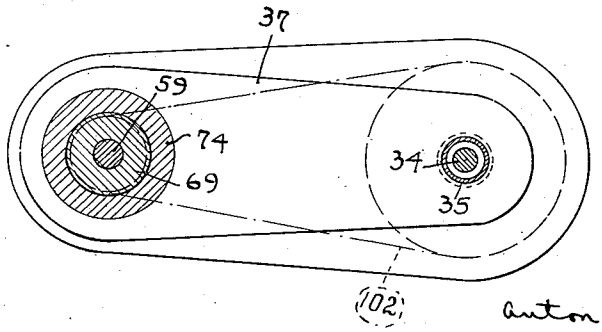


FIG. 7

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UNITED STATES PATENT OFFICE

2,052,666

CLOTHES RINSING AND DRYING APPARATUS

Anton C. Schmelzer, Cleveland, Ohio

Application September 7, 1933, Serial No. 688,513

17 Claims. (Cl. 210—71)

My invention relates to improvements in clothes rinsing and drying apparatus.

The principal object of the invention is to provide an improved centrifugal rinsing and drying apparatus which may be conveniently attached to and driven from the conventional wringer type of washing machine.

Another object of the invention is to utilize the wringer drive shaft housing or tubing as a means of attachment and support for the drier.

A further object of the invention is the provision of means for stepping up the speed of rotation of the wringer drive to adapt the same for driving the centrifugal drier.

This is conveniently accomplished according to my invention by providing means whereby the centrifugal drier may be connected directly to the wringer drive, and substituted for the wringer, upon removal of the latter from the machine.

Referring to the accompanying drawings wherein one embodiment of the invention is illustrated:

Figure 1 shows a side view of a washing machine with the drying apparatus according to the invention attached thereto;

Figure 2 is an enlarged sectional view through the wringer drive coupling mechanism of a washing machine;

Figure 3 is a longitudinal sectional view of the drying apparatus;

Figure 4 is an enlarged sectional view of the rotatory support of the drier;

Figure 5 is a longitudinal sectional view on line 5—5 of Figure 3;

Figure 6 is a plan view of the drying apparatus partly in section to disclose the suspension of the drying basket;

Figure 7 is a horizontal sectional view on line 7—7 of Figure 5;

Figure 8 is an enlarged sectional view through the drive shaft showing the rotatable arrangement of the gear box with respect to the housing for the drive shaft; and

Figure 9 is a sectional view on line 9—9 of Figure 1 showing a plan view of the bracket which connects the drying apparatus to the washing machine.

Referring more particularly to the drawings, 1 denotes a tub or washing receptacle of any suitable construction which is supported on legs 2 and closed at its top by means of a removable cover 3. Within the receptacle 1, and at the bottom thereof, is an agitator 4 including a sleeve portion 4' sleeved upon and suitably keyed to a vertical shaft 5 driven from a motor M. A horizontally disposed main drive shaft 6 leading from motor M carries a worm 7 which meshes with and drives a large worm gear 8 fixed to the lower end of a wringer drive shaft 9. Rotatably fixed to and depending from worm gear 8 is a crank arm 10 to which one end of a rack bar 11 is pivoted the other end of this arm meshing with a pinion 12 fixed to the lower end of the sleeve 4' previously mentioned. The radial agitator blades 13 being fixed to sleeve 4' and the latter being keyed to vertical shaft 5, it follows that these blades will be oscillated when motor M is running.

Shaft 9 and its enclosing tubing or sleeve 14 lead upwardly to a gear case 15 which sleeves over and is supported by the upper end of said tubing. The gearing within gear case 15 for actuating the wringer (not shown), include a pair of bevel gears 16—16 loosely mounted upon the upper end of the shaft 9 and normally engaging with the upper and lower faces of the gear 17. A short coupling shaft 18 fixed to this gear 17 by pin 19 has a squared outer end 20 adapted for detachable slip connection with the lower or drive roll of the wringer, the latter being customarily provided with a correspondingly squared opening for this purpose. The inner ends of gears 16 are provided with clutch faces 16' adapted to be engaged by corresponding clutch faces on the ends of an interposed clutch collar 21 which is splined upon the shaft 9 to rotate therewith and with freedom to move endwise into and out of engagement with the clutch faces 16'.

A rock shaft 22 is journaled in a suitable bearing 23 on the outer side of the gear case 15 and is held against movement by an adjusting screw 24 which enters an annular groove 25. This rock shaft is provided with an eccentric pin 26 carrying the roller 27 which rides in the annular groove 28 in the clutch collar 21 to adjust said collar axially into and out of engagement with one or the other of the gears 16, according to the direction in which it is desired to rotate the wringer rolls. A handle 29 affords convenient means for operating the rock shaft.

The tubing 14 which encloses the wringer drive shaft 9 is connected to the washer 1, by means of a bracket 30 and the reduction gearing box 31 is also connected by an arm or bracket 32 to the washer, thus providing a stable support for the wringer and its mechanism. It will also be noted that reduction gearing 7 and 8 permit of the shaft 9 being rotated at suitable wringer speed. As the mechanism so far described is of old and well known construction further detailed description thereof is deemed unnecessary.

The present invention comprises a centrifugal drier tank or receptacle 33 the mechanism of which is driven from the squared end 20 of coupling shaft 18, by means of drive shaft 34. This shaft 34 is enclosed for rotation in a tubing 35 supported at opposite ends adjacent one side

of the drier tank, by means of upper and lower brackets 36 and 37 in turn secured to and projecting laterally from the centrifugal drier.

Drier tank 33, preferably cylindrical in shape is reduced in diameter at its lower end to form a drain chamber 42 and a cylindrical portion 41 forming part of the housing of a pump 44. As shown the pump housing consists of two halves, a lower half 43, formed by the inwardly bent and suitably shaped lower part or wall of portion 41 and an upper half 45 consisting of a preferably cup-shaped inset member which rests upon and is welded to said lower half 43. A plurality of impeller blades 46 rotate in the portion 41 and discharge liquid into the pump housing. These impeller blades 46 are secured in any suitable manner as by rivets 40 to inner and outer spaced bell shaped blade retainers 47 and 48 respectively, which retainers form a bell shaped chamber circumferentially open at its top and bottom and in communication at its bottom with the pump housing. The bell shaped chamber, when rotated by driven shaft 59 forces the liquid in said chamber by centrifugal action into the pump housing from where such liquid is discharged in any suitable manner as for example through a passage 54.

A downwardly and inwardly inclined drain board 49 is formed with an outer, depending, annular flange 50, which engages snugly the inner wall of portion 41 and rests upon the upturned flange 51 of the upper half 45 of the pump housing. Drain board 49 is also formed with a shirt inner depending flange 50' surrounding the central drip opening 53. Flange 50' extends over the outer retainer member 48 and directs water extracted from the clothes between the bell-shaped retainers 47, 48 from whence it is discharged in an obvious manner through outlet 54, when the impeller blades and their retainers are rotated.

Mounted within the tank 33 for rotation about the axis is a short shaft 59, which extends downwardly through the tank and carries a perforated metal clothes basket or extractor 55 in which the clothes to be rinsed and dried are placed. This basket is formed intermediate its ends with an outwardly bulged curved portion 56 which seats within a supporting ring 57 in turn welded or otherwise suitably secured to the upper ends of a plurality of supporting arms 58, substantially U-shaped in cross section, and preferably three in number. The lower portion of ring 57 is curved inwardly corresponding to the curvature of bulged portion 56, to snugly receive the latter, and the upper portion 52 of the said ring is straight to permit insertion of the basket therein and removal therefrom. While the curvature of the bulged part 56 of the basket 55 corresponds closely to the curvature of the curved portion of the ring 57, and a snug fit is had between these parts, the fit is such that the basket is free for universal movement. One or more driving pins 85 project outwardly from the basket through notches 86 in the straight portion 52 of ring 57 thus locking these parts against independent rotary movement. Consequently all danger of chattering will be eliminated under such circumstances. However, should the weight of clothes be unevenly placed in the basket, the latter will automatically tilt in its swivel ring mounting and bring the weight closer to the axial center of the drive shaft, thus eliminating objectionable chattering and strain by keeping the basket in perfect balance.

The lower angularly bent portions of the arms 58, have arc-shaped ends which fit snugly together in the form of a circle and are clamped to the drive head 60 of the shaft 59 by means of a cap 61, the depending annular flange 62 of which is formed with slots 63 to receive the upstanding flanges 64 of the U-shaped arms. The inner impeller blade retainer 47 is pressed upon or otherwise suitably secured to drive head 60 for rotation therewith. The upper squared end 65 of shaft 59 fits within the squared opening 66 of the drive head and a bolt 67 passes through the cap 61, arms 58 and into the said squared end of the shaft to clamp these parts securely together. Shaft 59 extends downwardly through an upper bearing 68 which seats within a bearing support 69, the upper ends of both of which parts are enclosed by the depending sleeve flange 70 of the drive head on which the inner impeller blade retainer 47 is fixed. A felt packing member 71 interposed between the lower end of bearing 68 and a shoulder 72 on the bearing support 69 takes care of the slight amount of water which may back up between the drive head and bearing support and thence down around the shaft and its upper bearing. However the upper end of the shaft 59 is formed with shallow spiral grooves 73 cut in a direction opposite to the rotation of the shaft to expel with pumping effect practically all water before it has an opportunity to reach the felt packing.

A bearing housing 74 which is screwed to the bearing support 69 at 75, supports the lower half 43 of the pump 44, formed by the lower end of the drive tank, and clamps the latter to the bearing support, a lead packing 76 being employed to insure a liquid tight seal. This housing also encloses and supports thrust bearing upon which the lower end bearing support 69 seats. This thrust bearing consists of an upper part 77 pressed upon the shaft 59 for rotation therewith, and a lower part 78, fixed to the bearing support housing 74, balls 79 being interposed between the parts 77 and 78. A lower bearing member 80 is screwed into the lower end of the housing 74 against a packing member 81 which packing prevents escape of oil. The entire weight of the drier is borne by supporting bracket 37 secured at one end to the bearing support housing 74 by means of bolts 82 and at its other end welded to the tubing 35 enclosing the main drier shaft 34 which shaft 34 is driven through coupling shaft 18 previously referred to as being conventionally employed for driving a wringer, not shown. Bracket 37, is formed with openings to facilitate attachment to the housing 74 and shaft tubing 35 respectively.

Coupling shaft 18 fits within the squared opening of a coupling member 90 secured to one end of a horizontal shaft 91 which extends through an end plate 138 closing the open end of gear box 15 and through a bearing 92 into a gear box 93, and then into a second bearing 94. The front portion of bearing 92 is sleeved into a tubular extension 139 of plate 85 and thus permits axial adjustment of shaft 91 with respect to coupling shaft 18. Fixed to shaft 91 is a large bevel gear 95 which drives a small bevel gear 96 loosely mounted on shaft 34 and fixed to a large gear 97 also loosely mounted on shaft 34. Gear 97 drives a small gear 98 loosely mounted on the stud shaft. Large idler gear 100 meshes with and drives a small gear 101 keyed to the drier shaft 34, thus driving the latter at much greater speed than that of wringer coupling shaft 18.

A drive belt 102 connects a large pulley 83 on shaft 34 with a small pulley 84 on shaft 59, thus completing the drive from motor M to the drier basket 55.

Mounted in the upper end of the drier tank 33 is a rectangular tray 108, having a depending annular flange 104. Bracket 36 is secured to the bottom of tray 108 by rivets 105 or other suitable fastening means. This bracket extends to and is connected with the tubing 35 thus cooperating with bracket 37 to rigidly support the drier and its mechanism. A drain ring 106 seats within the tray, which ring prevents clothes from dropping down between the clothes basket 55 and the inner wall of the tank 35.

The drier is provided with a pair of slidably mounted drain boards 109 which serve as a cover when in inner position and as a support for the clothes when in Figure 6 or extended position. Secured to the inner ends of these boards are angle irons 110 the vertical portions 111 of which are notched at their ends as at 112. These notched ends interlock with the top and bottom walls of slots 113 formed in opposite sides of the rectangular tray. The notched ends of angle irons 110 can be freely inserted into the slots during assembly, by tilting the outer ends of the boards upwardly, entering the notched ends into the slots and then tilting the boards downwardly.

Gear box 93 is preferably swiveled to tubing 35 to facilitate coupling of shaft 91 with the coupling shaft of a wringer type washing machine. To obtain this desideratum the bottom wall of said box is provided with a downwardly extending flange 114 encircling the opening 115 through which shaft 34 passes. Flange 114 extends into tubing 35 and rests with its lower edge upon a steel washer 116, which washer seats upon a bearing 117 for shaft 34. This bearing is tightly secured to tubing 35, by pressing the wall of said tubing circumferentially into a grooved portion 118 of bearing 117 as at 119. A bushing 120 secured to shaft 34, is seated upon steel washer 116, and supports the said shaft. It can be seen that gear box 93 can easily be rotated to any desired position to effect proper coupling between shaft 18 and shaft 91. This swiveled mounting of gear box 93, also permits of the drier being rotated about the axis of tubing 14 for the purpose of bringing the wash board 109 into proper relative position with the open top of the washer, after the shafts 91 and 18 have been coupled.

Shaft 34 is guided at the lower end of tubing 35 in a bushing 121, which is also rigidly secured to said tubing by pressing the tubing wall into a grooved portion 122 of said bushing. A packing 123, held in place by a gland member 124 seats the bottom end of tubing against shaft 35.

Tubing 35, is utilized to secure the drier to a washing machine, a bracket 125, clamped to tubing 35 and to the tubing 14 of the washing machine being employed for making the connection. This bracket comprises two parts 126, 127 each of which includes a tube clamping seat 128, 129 respectively adapted to snugly receive one of the tubes 14 and 35 and to tightly grip said tube, when thumb nuts 130 of bolts 131 are screwed home. The two parts 126 and 127 of bracket 125 are linked together by levers 132, 133 pivotally connected with the respective bracket parts 126 and 127 and with each other. There are two levers connected to each part 126 and 127 and the pivotal connection of these levers with each other is guided in a vertical slot 134, which is provided in a lateral extension 137 of bracket part 126. This arrangement permits shifting of the drier with respect to the washing machine for quick adjustment of the drier with respect to the said washing machine. When proper adjustment between the drier and the washing machine has been made, the thumb nuts 135 of bolts 136, are screwed home to rigidly clamp levers 132 and 133 together and secure the drier in its adjusted position.

Having thus described my invention, what I claim is:

1. In a centrifugal drier unit adapted to be coupled with the wringer drive shaft of a washing machine, a casing, an extractor container journaled within said casing, a means for driving said container including a drive shaft, a bearing housing for said shaft secured to said casing coaxial with said drive shaft, bearing means within and supported by said bearing housing, and a coupling means supported upon said bearing housing and connected with said drive shaft, said coupling means being independent of said casing and adapted to be connected to the wringer gear box of a washing machine.

2. In a centrifugal drier unit adapted to be coupled with and driven by the wringer drive shaft of a washing machine, a casing, an extractor container journaled within said casing, a drive shaft adjacent to said casing, extended above the top thereof and coupled with said extractor container, a tubular bearing housing for said drive shaft secured to said casing coaxial with said drive shaft, and a gear box supported upon said tubular housing independent of and above said casing, said gear box being coupled with said extended drive shaft, and a shaft laterally extending from said gear box, said lateral shaft being adapted to be coupled with the wringer-gear box of a washing machine.

3. A centrifugal drier unit adapted to be coupled with and driven by the wringer drive shaft of a washing machine all as described in claim 2, wherein said gear box is freely rotatably supported upon said tubular housing.

4. In a centrifugal drier unit adapted to be driven by the wringer drive shaft of a washing machine and coupled with the wringer gear case thereof, a casing, an extractor container journaled within said casing, a vertical drive shaft laterally arranged of said casing and extended above the top thereof, a tubing coaxial with said extended shaft, means for securing said tubing to said casing, a gear box rotatably supported upon said tubing independent of and above said casing and coupled with said extended shaft, a horizontal shaft extended from said gear box, and coupling means including means slidably mounted on said gear box and sleeved upon said horizontal shaft, said coupling means being adapted to couple and align said gear box and its horizontal shaft with the wringer gear case of a washing machine.

5. A centrifugal drier unit as described in claim 1 embodying clamping means secured to said bearing housing between the opposite ends thereof, said clamping means including a laterally extending arm provided at its end with clamping extensions adapted to tightly grip the tubing of the wringer drive shaft of a washing machine.

6. In a centrifugal drier unit adapted to be coupled with the wringer drive shaft of a washing machine, a casing, an extractor container journaled within said casing and means adapted to connect said casing to the wringer drive shaft

tubing of a washing machine, said connecting means including a vertical tubing secured at spaced points to one side of said casing, and a drive shaft within said vertical tubing, means at the upper end of said shaft adapted to be coupled with the wringer gear case of a washing machine, and means at the lower end of said shaft for driving connection with said extractor container, said means at the upper end of said shaft being enclosed in a gear casing pivotally supported upon said tubing for free rotatory movement with respect to said casing.

7. In a centrifugal drier unit adapted to be coupled with the wringer drive shaft of a washing machine, a casing, an extractor container journaled within said casing, a vertical drive shaft for said extractor container arranged at one side of the casing, a tubing coaxial with said drive shaft, means for securing said tubing to said casing, a gear box pivotally supported upon said tubing above said casing coupled with the upper end of said drive shaft and rotary speed increasing means supported by said casing and coupled with said extractor container and the lower end of said vertical drive shaft.

8. In a centrifugal drier unit adapted to be coupled with and driven by the wringer drive shaft of a washing machine, a casing, an extractor container rotatably supported within said casing, a vertical drive shaft arranged at one side of said casing and extended above the top thereof, a tubing co-axial with said drive shaft, brackets securing the opposite ends of said tubing to said drier unit, a gear box pivotally supported upon the upper end of said tubing coupled with the upper end of said drive shaft, and speed increasing means secured to said casing below the bottom thereof and coupled with the lower end of said drive shaft.

9. A centrifugal drier unit as described in claim 8, wherein said gear box includes a horizontal shaft laterally extended from said box and wherein gearing in the gear box reduces the speed of said horizontal shaft with respect to the speed of said drive shaft.

10. A centrifugal drier unit as described in claim 8, wherein said extractor container is seated upon a vertical shaft and wherein pumping means are provided on said shaft below said extractor container for sucking water and air from said casing.

11. In a centrifugal drier unit adapted to be coupled with the wringer drive shaft of a washing machine, a casing, an extractor container journaled within said casing, means adapted to connect said casing to the wringer drive shaft tubing of a washing machine including a bearing housing secured at spaced points to said casing, a drive shaft journaled within said bearing housing, means at the upper end of said drive shaft adapted to couple said shaft with the wringer gear box of a washing machine, and means at the lower end of said shaft adapted to couple said shaft with said extractor container.

12. In a centrifugal drier unit adapted to be coupled with and driven by the wringer drive shaft of a washing machine, a casing, an extractor container journaled within said casing, a drive shaft adjacent to said casing coupled with said extractor container, a tubing secured to said casing coaxial with said drive shaft, a gear box freely rotatably supported upon said tubing independent of said casing, said gear box being coupled with said drive shaft, and a shaft laterally extending from said gear box, said lateral shaft being adapted to be coupled with the wringer gear box of a washing machine.

13. In a centrifugal drier unit adapted to be coupled with the wringer drive shaft of a washing machine, a casing, an extractor container journaled within said casing, a drive shaft adjacent to said casing, said shaft being coupled with said extractor container, a bearing housing for said shaft secured to said casing, a coupling means supported upon said bearing housing independent of said casing coupled with said shaft, said coupling means including means for attaching same to the wringer gear box of a washing machine and coupling said shaft with the wringer gear box, and means on said bearing housing between its opposite ends adapted to rigidly secure said bearing housing to the wringer drive shaft tubing of a washing machine, when said coupling means couple said drive shaft with the wringer gear box of said washing machine.

14. A centrifugal drier unit as described in claim 13, wherein said means on said bearing housing are vertically and rotatably adjustably secured to said bearing housing for facilitating coupling of said means with the said tubing of the wringer drive shaft of the washing machine.

15. A centrifugal drier unit as described in claim 13, wherein said means on said bearing housing are adjustably secured thereto and embody a laterally extensible clamping arm for facilitating clamping of said means to the tubing of the wringer drive shaft of said washing machine.

16. In a centrifugal drier unit adapted to be driven by the wringer drive shaft of a washing machine and coupled with the wringer gear case thereof, a casing, an extractor container journaled within said casing, a drive shaft laterally arranged of said casing and extended above the top thereof, a tubing coaxial with said extended shaft, means for securing said tubing to said casing, a gear box supported upon said tubing above the top of said casing coupled with said shaft, a horizontal shaft extended from said gear box, and means longitudinally and rotatably adjustably supported on said gear box in axial alignment with said horizontal shaft adapted to align said horizontal shaft of said gear box with the wringer gear case of a washing machine.

17. In a centrifugal drier unit adapted to be coupled with and driven by the wringer drive shaft of a washing machine, a casing, an extractor container rotatably supported within said casing, a vertical drive shaft arranged at one side of said casing, a bearing housing for said drive shaft supported by said drier unit, speed increasing means secured to said casing below the bottom thereof coupled with the lower end of said drive shaft and said extractor container, speed increasing means supported on the top of said bearing housing and coupled with the upper end of said drive shaft including a laterally extending shaft, and means on said last speed increasing means adapted to align said laterally extending shaft with the gear box of a washing machine and couple said laterally extending shaft with said gear box for actuation by the wringer drive shaft of said washing machine.

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