Oct. 9, 1951 J. A. DOLAN 2,570,529

WASHING MACHINE

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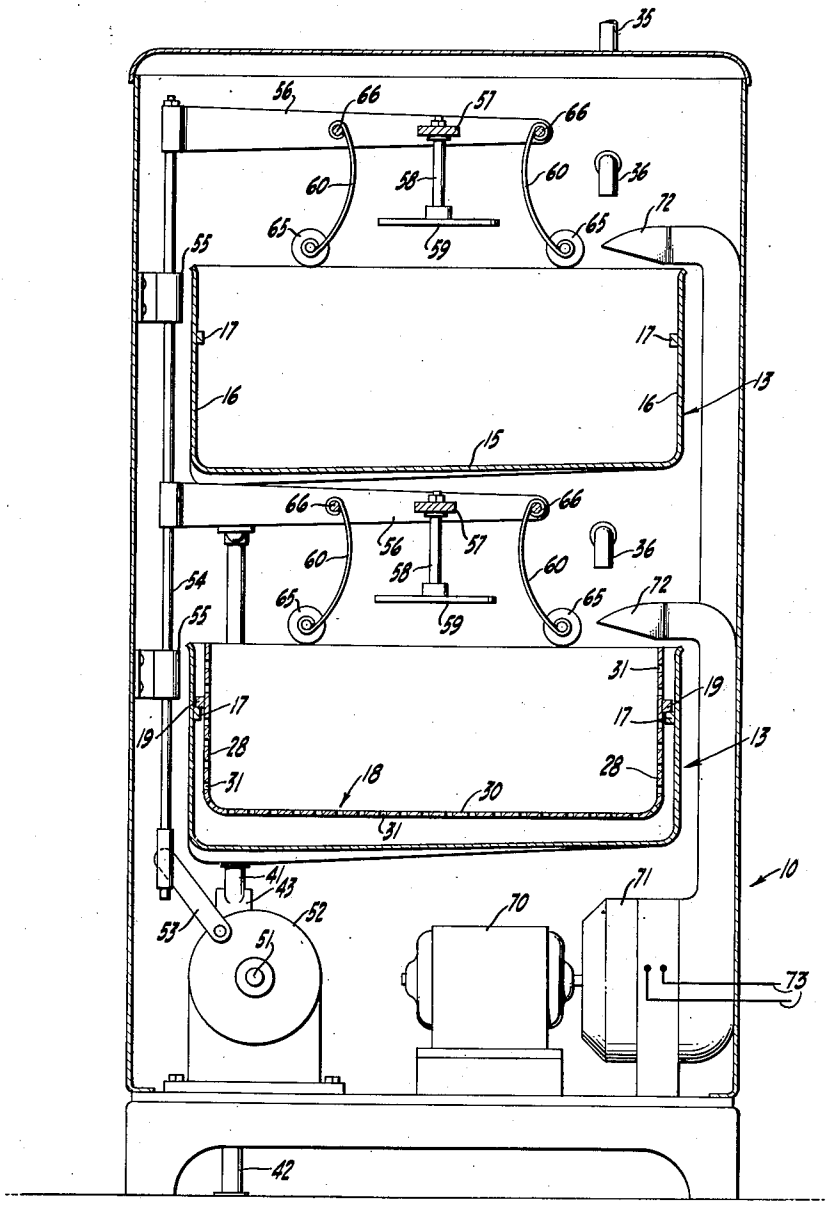
FIG. 1



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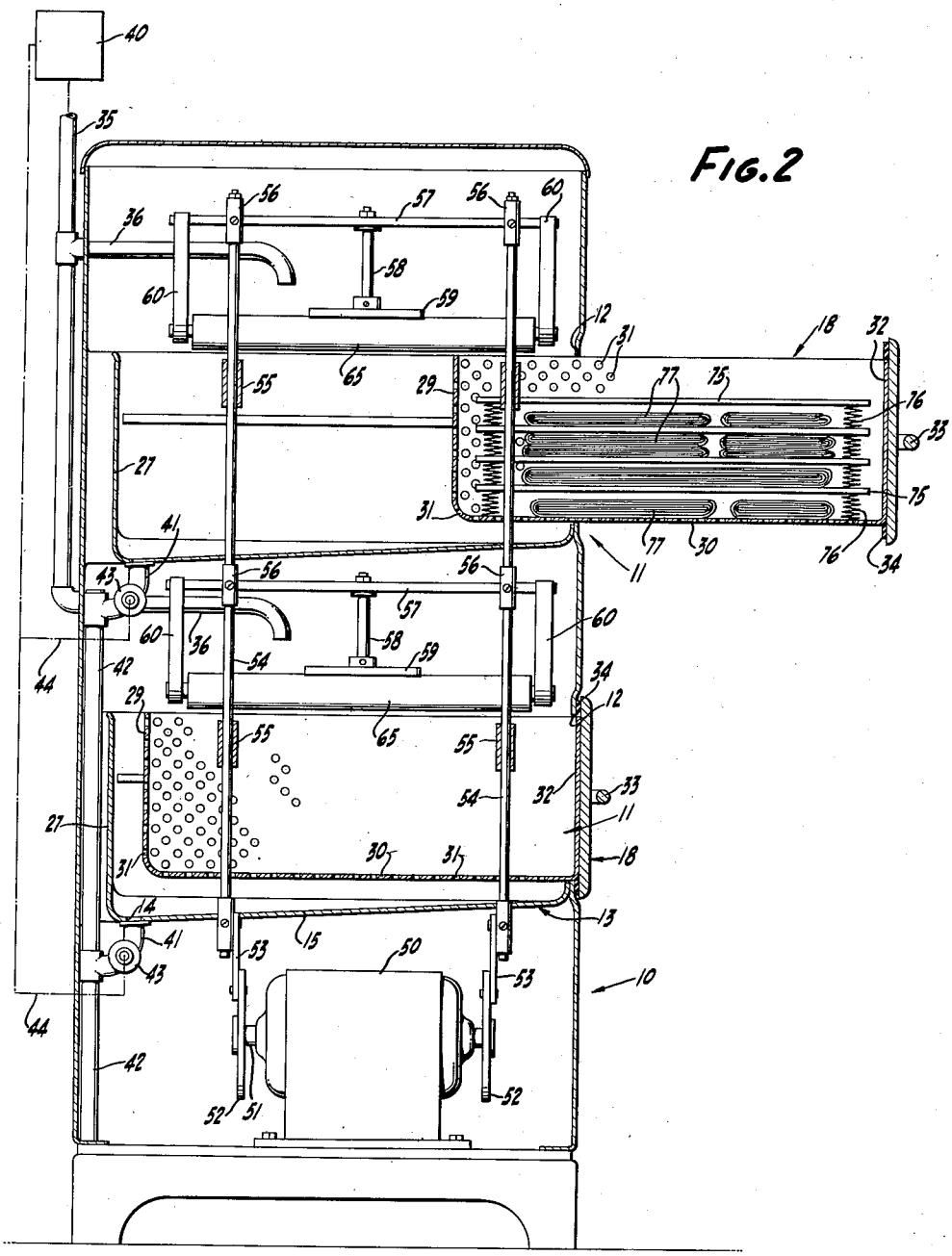

FIG. 2

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WASHING MACHINE

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6 Claims. (Cl. 68—20)

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This invention relates to a washing machine; more particularly, to a washing machine wherein the washing and drying operations are performed by reciprocating elements and which is adapted to launder and to dry clothes in a flat or semi-flat condition.

Present day washing machines of automatic and non-automatic types generally subject the clothes being laundered to rotary movement, as by means of an oscillating agitator or by means of a high speed rotary tub or basket. Machines of the automatic type having a washing cycle, a rinsing cycle and a drying cycle, employ centrifugal means to dry the clothes.

Such machines are subject to certain marked disadvantages. Thus, the automatic machines vibrate to a considerable degree, thus requiring that the machine be supported upon a very firm and solid foundation, preferably on a ground floor or in a basement or garage. Also, the rotary action of the machine causes knotting of the clothes, which, aside from being a matter of annoyance, is also destructive of delicate materials. Further, the wringer action of non-automatic machines and the centrifugal action of automatic machines fail completely to dry the laundered clothes.

Washing machines of the type employing a reciprocating plunger are known in the art. Thus McDougall Patent No. 79,671 and Methot Patent No. 1,402,634 disclose washing machines having reciprocating plungers. These machines are, however, deficient in several respects, among which is the failure to provide a drying cycle.

It is an object of the present invention to provide an improved type of washing machine of the reciprocating type.

It is a further object of the invention to provide a reciprocating or plunger type of washing machine which is capable of carrying out in sequence and automatically a washing cycle, a rinsing cycle and a drying cycle.

It is a particular object of the invention to provide a washing machine of the type employing a reciprocating plunger, which is effective to carry out the washing, rinsing and drying cycles and which is capable of performing these operations on clothes in a flat or a semi-flat condition without subjecting them to agitation of a degree or character such as to cause knotting of the clothes or damage thereto.

These and other objects of the invention will be apparent from the ensuing description and the appended claims.

One form which the invention may assume is exemplified in the following description and

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illustrated by way of example in the accompanying drawings, in which:

Fig. 1 is a vertical section through the machine of the invention.

Fig. 2 is a vertical section taken at right angles to the view of Fig. 1.

Referring now to the drawings, there is provided a frame or housing 10 embodying one or more washing units 11, as desired, two such units being shown for purposes of illustration. Inasmuch as the several units are identical, a description of one will suffice. The housing 10 is provided with a front opening 12 providing access to a tub 13, which is secured to the housing by any suitable means, as by welding. The tub 13 is imperforate except for a drain opening 14 at the rear end thereof and the bottom 15 of the tub is formed with a slope rearwardly and downwardly, as shown, so that water will drain from the front portion of the tub to the rear thereof. Secured to or integral with the side walls 16 of the tub are longitudinal ribs 17 for supporting a drawer 18 which is open at the top.

As shown, the drawer 18 is provided with complemental ribs 19 so as to be slidably supported in and spaced somewhat from the bottom 15, side walls 16 and rear wall 27 of the tub. The side walls 28, rear wall 29 and bottom 30 of the drawer 18 are provided with numerous perforations 31, as shown, and the front wall 32 is provided with a handle 33 and with a suitable watertight gasket 34.

Water for laundering and rinsing purposes is supplied through an intake pipe 35 and a branch pipe 36 for each of the units. A timing mechanism schematically indicated at 40 may also be provided to time the washing and rinsing cycles, such timing mechanism being of known construction. Drainage is provided through a branch drain pipe 41 and a main drain pipe 42, the branch pipe 41 having therein a valve 43 actuated by the timing mechanism 40 through a link 44.

Disposed within the housing and bolted to the floor thereof is a motor 50 having a shaft 51 to each end of which is secured a crank disk 52. A crank 53 is secured to each crank disk and to the free end of each crank is secured a rod 54. Each rod 54 is disposed vertically, being supported by bushings 55 bolted to the housing, and secured to and extending outwardly from the rods 54 above each washing unit 11 is a pair of parallel arms 56. Secured to and extending between each pair of arms 56 is a tie bar 57 centered over the adjacent drawer 18, and sus-

pended therefrom by a rod 58 is a diaphragm plunger 59. Suspended from each pair of arms 56 by means of leaf springs 60 is a pair of hard rubber rollers 65. As shown, the rollers 65 are disposed at opposite sides of the plunger 59 and lengthwise of the drawer 18, and the springs 60 have a curvature as shown and are pivotally connected to the arms 56 at 66. The rollers 65 are rotatable with respect to the springs 60.

The machine is also provided with drying means comprising a motor 70, a combined heater and blower 71 and ducts 72 communicating with the washing units 11. Current is supplied to the combined heater and blower through leads 73. The drying means may also be provided with a timing mechanism (not shown) of known construction for timing its operation with respect to the washing and rinsing cycles.

As shown in the upper washing unit of Fig. 2, a plurality of trays 75 may be provided, each having resilient legs 76 in the form of coil springs and adapted to be superimposed, one upon another, in a drawer 18 with laundry indicated at 77 disposed on each tray in flat condition.

In operation, the machine performs in the following manner: A drawer 18 is pulled out to open position, as shown in the upper unit of Fig. 1. Clothing or other articles to be laundered are placed in the drawer in flat condition, upon trays 75 if so desired. A suitable quantity of soap is placed in such drawer, as by sprinkling over the laundry, and the drawer is pushed inwardly to closed position. The motor 50 is started, thus causing the plungers 59 and rollers 65 to reciprocate. Water is let into the machine, its flow being controlled by the timing mechanism 40. Reciprocation of the plungers 59 causes sufficient agitation of the clothes to launder the same effectively. Meanwhile, the rollers 65 will reciprocate and, as they contact the clothes, will also move outwardly and inwardly, thus assisting in the laundering action and keeping the clothes in flat condition. The washing cycle will be terminated after a predetermined interval, and the rinsing cycle will be commenced by means of the timing mechanism 40. Similarly, the rinsing cycle will be terminated and the drying cycle commenced after lapse of a predetermined interval. The drain valves 43 will be appropriately opened and closed to maintain a proper level of water in the tubs and to drain the same at the conclusion of each cycle.

At the commencement of the drying cycle, the motor 70 and blower 71 will commence operation, causing circulation of hot air through the drawers 18. Meanwhile, the rollers 65, which, it will be noted, are disposed nearer the clothes than the plunger 59, will materially assist in drying the clothes by application of rolling pressure thereto, and they will also function to iron or press the clothes while still in a damp condition just before they are completely dry. Thus, at the conclusion of the drying cycle, not only are the clothes completely dry but they are also smooth and free from wrinkles.

It will thus be seen that a washing machine has been provided which employs the reciprocating or plunger principle, yet which obviates the disadvantages of plunger type washing machines as heretofore designed; which effectively carries out washing, rinsing and drying cycles; and which leaves the laundered clothes in absolutely dry, smooth condition.

While I have shown the preferred form of my invention, it is to be understood that various changes may be made in its construction by those skilled in the art without departing from the spirit of the invention as defined in the appended claims.

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

1. A washing machine comprising a clothes receptacle adapted to receive a body of clothes or the like in flat arrangement, a vertically reciprocable member disposed above said receptacle, a plunger supported by and depending from said reciprocable member, a depending resilient member carried by the vertically reciprocable member at each side of said plunger, and a horizontal roller rotatably supported by and at the lower end of each said resilient member and below said plunger.

2. A plunger type washing machine comprising a framework, a clothes receptacle supported thereby, a vertically reciprocable arm horizontally disposed over and above said receptacle, a plunger supported by and depending from said arm and adapted, on reciprocation of said arm, to agitate a body of clothes or the like and water to launder and rinse the clothes, pairs of spaced resilient members also supported by and depending from said arm on opposite sides of said plunger, and a roller supported by and at the lower end of each pair of said resilient members with its longitudinal axis horizontal, each roller being rotatable about said axis and said pairs of said resilient members being curved with their convex surfaces facing said plunger, whereby said rollers are yieldingly displaced outwardly and inwardly as they apply pressure to clothes in said receptacle during downstroke and upstroke, respectively.

3. A plunger type washing machine comprising a housing, a perforate clothes receptacle supported therein, a reciprocable plunger operable to agitate a body of clothes or the like and water in said receptacle to launder and rinse the clothes during a washing cycle and a rinsing cycle, pairs of spaced, resilient members disposed on opposite sides of said plunger and supported for vertical reciprocation, a roller supported by each pair of said resilient members, rotatable about its horizontal longitudinal axis and operable upon reciprocation of its supporting resilient members, and upon contact with a body of clothes in said receptacle to apply rolling pressure to said clothes, said resilient members being curved with their convex surfaces facing said plunger, and an electric heater operable to circulate heated air through said receptacle during the drying cycle.

4. A plunger type washing machine comprising a housing, a tub member mounted within the housing, said housing having an opening in one wall thereof in register with the tub and at a point above the bottom of the tub, a drawer movable horizontally through said opening to within said tub and overlying the bottom thereof, said drawer having foraminous walls and an imperforate wall to close said opening when the drawer is positioned within the housing and the tub, a horizontal arm within the housing overlying the tub and mounted for vertical reciprocation with respect thereto, an agitating plunger fixed to the arm substantially centrally of the tub for reciprocation into and out of said tub and drawer, a pair of spaced horizontally disposed parallel rollers disposed at opposite sides of the agitating plunger and below the same, supporting members supporting said rollers from said arm whereby they will reciprocate vertically with the arm,

said supporting members enabling said rollers to resiliently yield and move in outward directions upon the downward stroke of said arm and contact with clothes in said drawer, and to automatically return to normal condition upon the upward stroke of said arm.

5. A machine of the character described comprising a housing, a tub having an open upper end disposed within the housing, said housing having an opening in a side wall thereof in register with the tub, said opening terminating short of the bottom of the tub, a foraminous drawer reciprocable through said opening whereby it may be positioned within the tub or withdrawn from the housing, the front wall of said drawer being imperforate to effect closure of said opening, the bottom of said tub being inclined toward one end thereof for drainage, a rigid arm vertical reciprocable in the housing and overlying the tub, a plunger fixed to said arm and overlying substantially the center of the tub for agitating purposes within the tub upon reciprocation of the arm, a pair of parallel horizontally disposed rollers disposed one at each side of the plunger and overlying the tub, resilient members rotatably supporting said rollers from said arm whereby they will reciprocate in unison with the plunger, said resilient members being convexed in a manner enabling said arms to move horizontally outward upon contact with the clothes in the drawer upon the downward stroke of the arm and to automatically assume their normal condition upon the upward stroke of the arm.

6. A machine of the character described comprising a housing, a tub having an open upper end disposed within the housing, said housing having an opening in a side wall thereof in register with the tub, said opening terminating short of the bottom of the tub, a foraminous drawer reciprocable through said opening whereby it may be positioned within the tub or withdrawn from the housing, the front wall of said drawer being imperforate to effect closure of said opening, the bottom of said tub being inclined toward one end thereof for drainage, a rigid arm vertically reciprocable in the housing and overlying the tub, a plunger fixed to said arm and overlying substantially the center of the tub for agitating purposes within the tub upon reciprocation of the arm, a pair of parallel horizontally disposed rollers disposed one at each side of the plunger and overlying the tub, resilient members rotatably supporting said rollers from said arm whereby they will reciprocate in unison with the plunger, said resilient members being convexed in a manner enabling said arms to move horizontally outward upon contact with the clothes in the drawer upon the downward stroke of the arm and to automatically assume their normal condition upon the upward stroke of the arm, a drain for said tub, a means for supplying water to said tub, and a means for circulating heated air through said tub.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
43,290	Clark	June 28, 1864
52,108	Adams	Jan. 16, 1866
72,281	Frost	Dec. 17, 1867
599,175	Gillham	Feb. 15, 1898
1,825,584	Donley	Sept. 29, 1931
2,356,684	Miner, Jr.	Aug. 22, 1944

FOREIGN PATENTS

Number	Country	Date
309,500	Great Britain	Oct. 13, 1930