

July 2, 1957

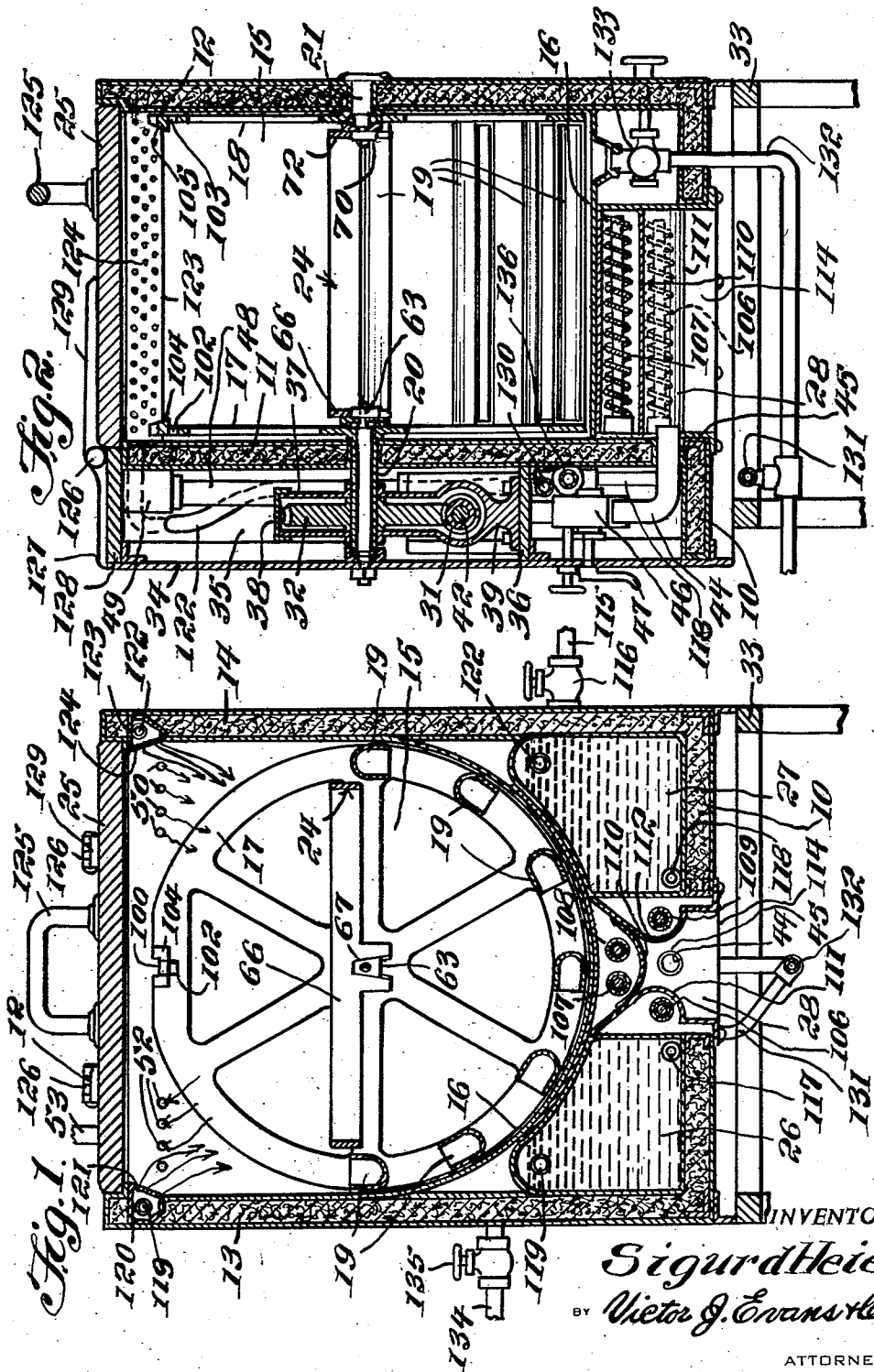
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COMBINATION WASHING, RINSING AND DRYING MACHINE

Filed Oct. 11, 1951

3 Sheets-Sheet 1



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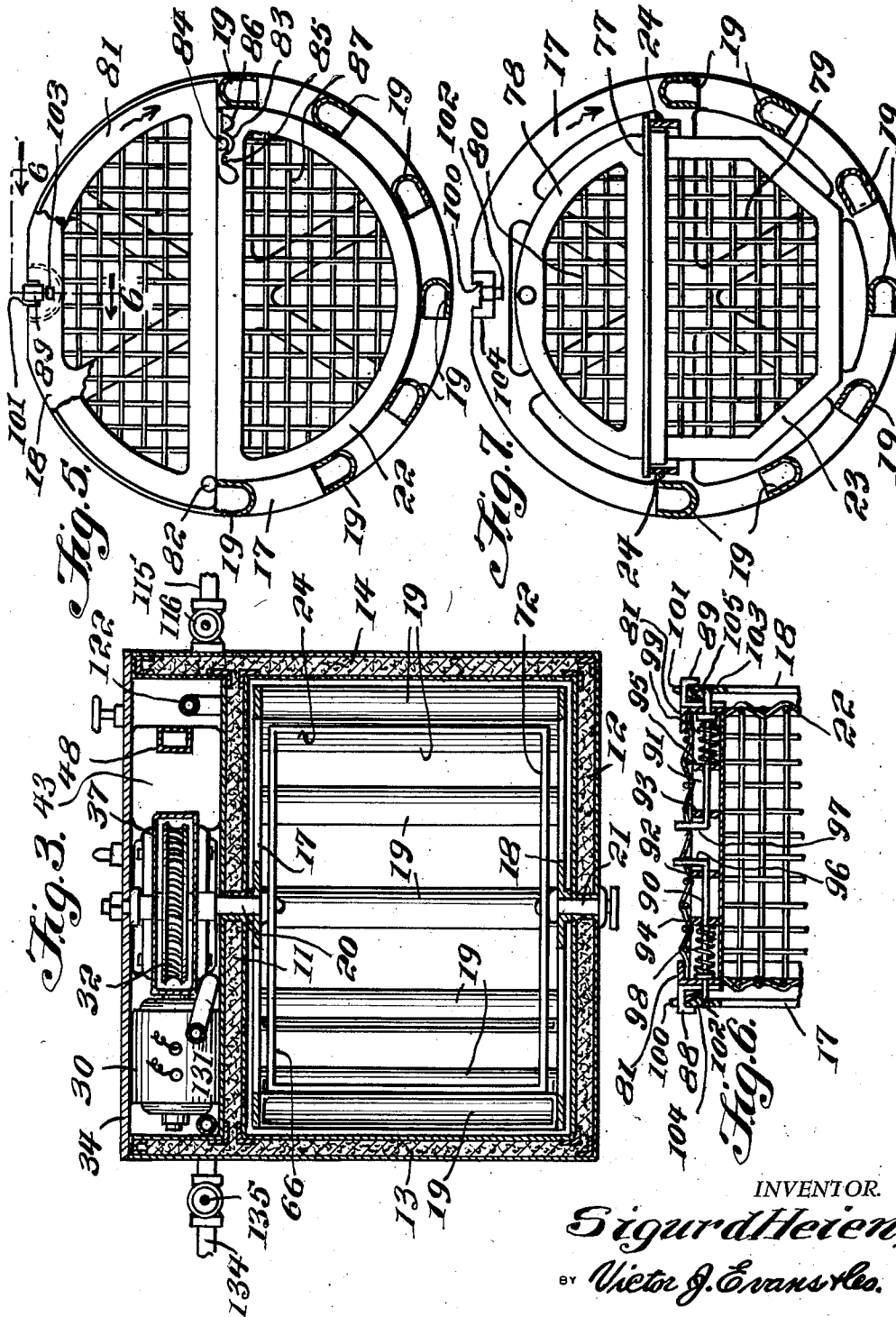
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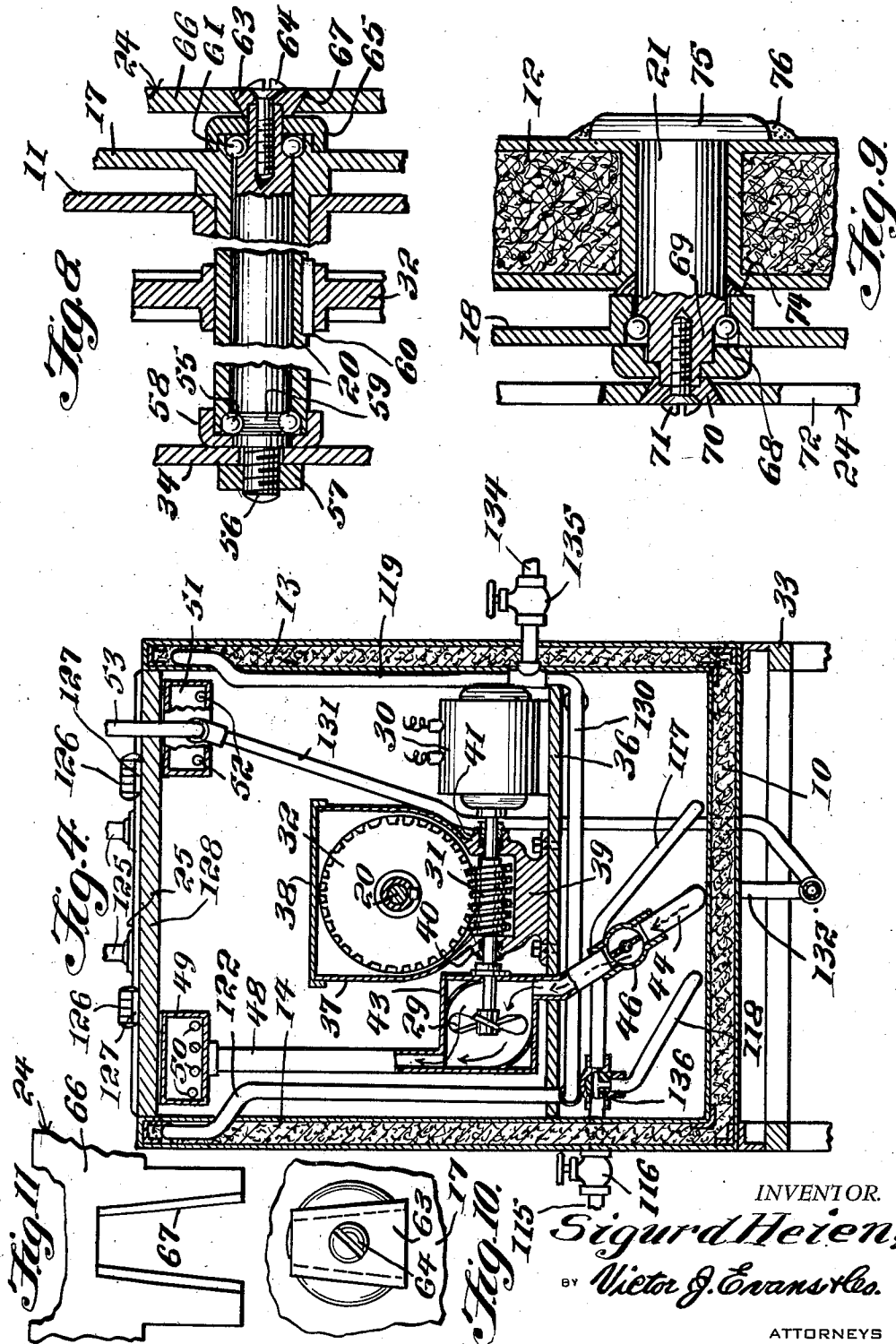
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COMBINATION WASHING, RINSING, AND DRYING MACHINE

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3 Claims. (Cl. 68-16)

This invention relates to general utility machines particularly adapted for household use, and in particular a machine having a housing with a washing chamber in which clothes, dishes and the like may be washed and in which products in the washing chamber may be sprayed with clean warm water for rinsing and also with air for drying.

This invention is an improvement over the machine of my Norwegian Patent No. 79,616, in that heating elements are provided between the water tanks.

The purpose of this invention is to provide a combination machine for washing, rinsing and drying clothes, dishes, and the like, wherein clothes, dishes and other products may be washed, rinsed and dried in a machine occupying comparatively little floor space and wherein the machine may also be used for supplying hot water for household use or may be used for heating and ventilating.

In the conventional type of washing machine of the agitator or rotary type it is possible for bunches of clothes to remain, within certain limits, in a pocket or portion of a machine and with this type of washing machine it is difficult, if not impossible, to insert a tray of dishes, bottles, or other articles. For this reason it is substantially impossible to use a clothes washing machine for washing dishes or a dish washer for washing clothes. With this thought in mind this invention contemplates a combination machine of the rotary cylinder type wherein a basket of clothes positioned in the cylinder is adapted to rotate with the cylinder whereas a basket of dishes placed in the cylinder remain stationary, and in which either clothes or dishes may be sprayed with soapy water for washing, clean water for rinsing, and air for drying.

The object of this invention is, therefore, to provide means for forming a washing machine wherein clothes, dishes, and other objects positioned in the machine are subjected to soapy water for washing, clean warm water for rinsing, and air for drying.

Another object of the invention is to provide a combination washing, rinsing, and drying machine in which a plurality of batches of clothes may be washed with the same soapy water.

Another object of the invention is to provide a combination washing, rinsing and drying machine in which handling clothes or other objects between the steps of washing, rinsing and drying is unnecessary.

A further object of the invention is to provide a combination washing, rinsing and drying machine which is of a simple and economical construction.

With these and other objects in view the invention embodies a substantially rectangular shaped casing having an open compartment or chamber with a semi-circular lower surface therein and with a cylinder positioned to rotate in said chamber and adapted to receive baskets that rotate therewith or that remain stationary. The invention also includes means for rotating the cylinder, means for supplying heated water or air to the cylinder

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and means mounting the parts whereby the parts are readily removable and replaceable.

Other features and advantages of the invention will appear from the following description taken in connection with the drawings wherein:

Figure 1 is a cross section through the machine showing the rotor, insulating wall, water tanks, and heating elements.

Figure 2 is a longitudinal section through the machine illustrating the mounting of the rotor and also showing the operating instrumentalities, heating elements and water connections.

Figure 3 is a sectional plan through the machine.

Figure 4 is also a cross section through the machine taken at one end of the housing and illustrating the operating instrumentalities of the machine.

Figure 5 is a detail showing a cross section through the rotor and illustrating a clothes retaining basket positioned in the rotor and mounted to rotate therewith.

Figure 6 is a longitudinal section through the rotor and clothes basket taken on line 6-6 of Figure 5 illustrating the latching elements for retaining the rotor and basket in position for operation in the machine.

Figure 7 is a cross section similar to that shown in Figure 5 illustrating a stationary basket for holding dishes in the rotor for washing, rinsing and drying.

Figure 8 is a detail showing a sectional plan through the rotor carrying shaft on the driving side of the machine showing the parts on an enlarged scale, with parts broken away, and also showing an end of the dish retaining basket removably supported on the end of the shaft.

Figure 9 is a similar detail showing the shaft at the opposite side of the machine and illustrating the sealing elements which make it possible to rotate the rotor or cylinder without fluids leaking through the bearings.

Figure 10 is a detail showing the dish washer basket frame supporting keys on the ends of the rotor mounting shafts.

Figure 11 is a detail showing one of the key sockets in the end plate.

Referring now to the drawings wherein like reference characters denote corresponding parts in the improved washing, rinsing and drying machine of this invention includes a housing having a base 10 with upwardly extended side walls 11 and 12 and end walls 13 and 14 providing an inner substantially open washing chamber 15 having a substantially semi-circular lower end 16, a rotor formed with discs or spiders 17 and 18 connected at one side of the center, with U-shaped buckets 19 and journaled, at one end, with a tubular shaft 20, and at the other with a stud 21, a basket 22 for holding clothes and the like and adapted to be positioned in the rotor, a basket 23 for holding dishes and the like and adapted to be held in a stationary frame 24 in the rotor, a cover 25 positioned in the upper end of the housing, cleaning water tanks 26 and 27 positioned below the rotor, a heating chamber 28 positioned between the tanks, a fan 29 for circulating heated air and a motor 30 for rotating the rotor through a worm 31 and a worm gear 32.

The housing, which is preferably mounted on a stand 33 is provided with an extended wall 34 that is spaced from the side wall 11 providing a gear compartment 35 in which the motor 30 and gears 31 and 32 are positioned. The motor and gears are mounted on a shelf 36 and the gear 32 is provided with a casing 37 having a cover plate 38. This casing is mounted on a stand 39 in the ends of which bearings 40 and 41 are provided and in which a motor shaft 42 is journaled. The shaft 42 extends into a fan housing 43 in which the fan 29 is positioned and the housing is provided with a connection 44 which extends through an opening 45 in the lower part of the heating chamber 28. The connection 44 is

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provided with a valve 46 and the valve is actuated by a handle 47 that extends through the wall 34. From the fan housing 43 the air is driven through a passage 48 to a hot air chamber 49 and the chamber 49 is provided with perforations 50 through which heated air is blown into the rotor chamber 15.

A similar exhaust housing 51 having perforations 52 therein is also provided in the upper part of the chamber 35 and this housing is positioned to exhaust air from the chamber 15 with the air passing through an exhaust connection 53.

The tubular shaft 20 by which one end of the rotor is journaled in the housing is mounted, as illustrated in Figure 8, with the outer end journaled by a ball bearing 54 on a stationary shaft 55 the outer end of which is provided with a threaded stud 56 by which the shaft is secured in the wall 34 by a nut 57. The outer end of the tubular shaft 20 is provided with a cap 58 which provides a closure for the bearing and the shaft is provided with an annular recess 59 in which the balls of the bearing travel.

The gear 32 is positioned on and keyed to the tubular shaft 20 with a key 60 and the opposite end of the shaft, which is integral with the disc 17 is journaled on the stationary shaft 55 with a bearing 61. This end of the stationary shaft is also provided with a stud 62 and a wedge shaped mounting key 63 which is formed with beveled edges is secured to the end of the shaft, through the stud 62 by a screw 64. This end of the shaft is also provided with a bearing cap 65 that is positioned over the bearing 61. The key 63 provides means for retaining the basket 23, in which dishes and the like may be placed on the end of the stationary shaft, the basket being suspended in the frame 24 which is provided with an end plate 66 in which a socket 67 which is formed with beveled tapering sides similar to the key 63, is positioned.

The disc 18 at the opposite end of the rotor is journaled by a bearing 68 on the small end 69 of the stud 21 and a key 70 having sloping beveled side surfaces similar to the key 63 is secured to the end of the stud 21 by a screw 71. This end of the frame 24 being provided with a plate or bar 72 which is also provided with a socket similar to the socket 67, having beveled tapering sides to correspond with the edges of the key 70.

The stud 21 is secured in the outer wall 12 of the housing, preferably by welding, as shown at the point 74 and the outer end of the stud is provided with a head 75 that may also be secured in position by welding as shown at the point 76.

The upper edge of the stationary basket 23, which is provided for holding dishes and the like, is provided with a continuous flange 77 which rests upon the upper edges of the side and end bars of the frame 24 with the basket positioned in the rotor, as shown in Figure 7, and the upper part of the basket is provided with a cover or closure section 78. The lower part of the basket is provided with longitudinally disposed wires or rods 79 to facilitate holding dishes and similar rods or wires 80 are provided in the upper section 78.

When it is desired to use the machine for washing dishes the dishes are placed in the basket 23, either with the basket positioned in the machine or with the basket positioned on a table or a bench. With the dishes positioned in the basket the basket is placed in the frame 24, the frame being mounted in the rotor with the sockets 67 and 73 positioned over the keys 63 and 70, respectively.

When it is desired to use the machine for washing clothes the basket 23 and the frame 24 are removed and the basket 22 is positioned in the rotor, as illustrated in Figure 5.

The basket 22, which is used for washing clothes, is provided with an upper section or cover 81 which is secured to the lower section 22 by hinges 82 and the upper section is secured to the lower section by a latch

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83 that is provided with a socket that extends over a pin 84 and with the latch secured in the closed position by a bar 85 and pivotally mounted by a pin 86 the parts of the basket are secured in the closed position until the latch 23 is manually released.

With the parts arranged in this manner the edges of the upper section 81 are positioned on the diametrically opposite buckets 19, as shown in Figure 5. With the basket 22 mounted in the rotor in this manner the basket rotates with the discs 17 and 18.

The clothes washing basket 22 is also provided with a diametrical separation wall formed by spaced longitudinally extended rods 87 whereby the clothes on both sides of the separation wall or partition circulate with the rotation of the basket.

The upper part of the basket is provided with latches 88 and 89 which are positioned at the ends of rods 90 and 91, respectively, and with the rods slidably mounted in bearing blocks 92 and 93 at the center and 94 and 95 located at intermediate positions the latches hold the basket and the rods lock the basket in the rotor. The rods may readily be withdrawn by projections 96 and 97 on the inner ends of the rods.

The rods 90 and 91 are resiliently urged outwardly by springs 98 and 99, respectively, whereby the rods extend through sockets 100 and 101, respectively, and with the ends of the rods 90 and 91 in sockets 102 and 103 below projections 104 and 105 on the discs 17 and 18.

The heating chamber 28 is provided with electric heating elements 106, 107, 108 and 109 and, as illustrated in Figure 1, the elements 107 and 108 are positioned above a reflector 110 by which the heat is reflected upwardly into the chamber 15 of the washer, the element 106 is provided with a reflector 111 by which heat is reflected toward the tank 26 and the element 109 is provided with a reflector 112 by which heat is reflected toward the tank 27.

The heating chamber 28 is provided with an open passage 114 in the lower end and heat from the chamber is circulated by the fan 29 in the upper part of the chamber 15 through the connections 44 and 48.

Water is supplied to the tanks 26 and 27 through a supply connection 115 which is provided with a valve 116 and the connection 115 extends through the lower part of the compartment 35 with the ends thereof entering the tanks 26 and 27 through connections 117 and 118, respectively.

From the tank 26 heated water passes upwardly from a pipe 119 to a spray chamber 120 in the upper end of the wall 13 and the inner side of the spray chamber is provided with a perforated plate 121 through which water is discharged into the chamber 15.

A similar connection 122 extends from the tank 27 to a spray chamber 123 in the upper end of the wall 14 and the face of the chamber 123 is provided with a perforated plate 124. By this means hot water from the tanks 26 and 27 is sprayed over clothes in the basket 22 or dishes in the basket 23.

The cover 25, which is provided with a handle 125 is positioned in a continuous recess in the upper part of the housing and the cover is secured in position by hinges 126, one of the plates 127 of which are secured to the upper panel 128 of the housing and the other plates 129 of the hinges are secured to the cover 25.

The U-shaped buckets 19 which are carried by the discs 17 and 18 are positioned only on one side of the rotor so that the baskets 22 and 23 may be positioned in the rotor from the opposite side. With the buckets positioned in this manner the baskets may be removed and replaced as desired with the cover 25 in the open position.

The pipes or connections 119 and 122 are provided with a cross connection 130 and an overflow connection 131 extends from the exhaust connection 53 of the exhaust tank 51 to a drain connection which extends through the lower part of the housing providing a drain for the

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chamber or compartment 15. The pipe 132 is also provided with a valve 133 and the connection 132 extends from the valve 133 to a drain. The hot water connections 119 and 130 are provided with a hot water outlet connection 134 having a valve 135 therein.

The water intake is provided with a valve 136 of the three-way type whereby the water may be supplied to the tank 26 or the tank 27 or the water may be used for flushing the chamber 15 for cleaning. Connections may also be provided to drain the chamber as may be desired.

With the parts arranged in this manner the basket 22, with clothes or the like therein is positioned in the rotor, as illustrated in Figure 5 and the rotor is rotated with the clothes therein. As the rotor rotates hot soapy water may be sprayed through the basket on the clothes for a predetermined period of time and when the water reaches the desired elevation the water is cut off with the rotor continuing to rotate.

Should it be desired to wash several batches of clothes in the same water the basket 22 is removed, the clothes removed therefrom and with soiled clothes placed therein the basket is replaced.

However, for normal use the basket with the clothes therein remains in the housing and when the soapy water is drained therefrom rinsing water is applied to the clothes with the basket rotating continuously and after the clothes are thoroughly rinsed the water is cut off and heated air circulated through the housing for drying the clothes. After the clothes are dry they are removed and the cycle of operations is repeated.

The same cycle of operations may be used for washing dishes wherein the basket 22 is removed and the basket 23 positioned on the keys 63 and 70 whereby the basket 23, with dishes therein remains stationary as the soapy water, rinsing water, and air are supplied to the basket.

It will be understood that although the machine is described as being particularly adapted for washing clothes and dishes it may be used for other purposes, particularly such as supplying hot water to a heating system of a building or to a kitchen or bathroom and the hot air circulated through the device may be utilized for heating and other purposes.

It will be understood that modifications may be made in the design and arrangement of the parts without departing from the spirit of the invention.

What is claimed is:

1. In a washing machine, the combination which comprises a vertically disposed housing, a horizontally disposed shaft rotatably mounted in one end of the housing, a stud mounted in the end of the housing opposite to that in which the shaft is positioned and aligned with said shaft, a rotor including spaced spiders mounted on the shaft and stud and connected on one side of the longitudinal center thereof with spaced longitudinally disposed buckets for conveying fluid upwardly and depositing the fluid over products between the spiders, an open washing chamber substantially semi-circular in cross section positioned below and spaced from the rotor, spaced water tanks in the housing and positioned below the washing chamber, heating elements in the space between the tanks for, selectively, heating the water in the tanks, or heating air passing through the area between the tanks, means for suspending articles in said rotor, and means for circulating water from the tanks to spray devices positioned above the rotor.

2. In a washing machine, the combination which comprises a vertically disposed housing, a horizontally disposed shaft rotatably mounted in one end of the housing, a stud mounted in the end of the housing opposite to

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that in which the shaft is positioned and aligned with said shaft, a rotor including spaced spiders mounted on the shaft and stud and connected on one side of the longitudinal center thereof with spaced longitudinally disposed buckets for conveying fluid upwardly and depositing the fluid over products between the spiders, an open washing chamber substantially semi-circular in cross section positioned below and spaced from the rotor, a worm gear mounted on the shaft, a worm positioned to mesh with said worm gear, a motor for actuating the worm, a fan adapted to be actuated by the motor, spaced water tanks in the housing and positioned below the washing chamber, heating elements in the space between the tanks for, selectively, heating the water in the tanks, or heating air passing through the area between the tanks, means for suspending articles in said rotor, and means for circulating water from the tanks to spray devices positioned above the rotor, said fan being adapted to circulate air through the heating elements and also through the interior of the rotor.

3. In a washing machine, the combination which comprises a vertically disposed housing having a gear compartment in one end, a cover hinged to the upper end of the housing, a horizontally disposed shaft rotatably mounted in the end of the housing in which the gear compartment is positioned, a stud mounted in the end of the housing opposite to that on which the gear compartment is positioned and aligned with said shaft, a rotor including spaced spiders mounted on the shaft and stud, spaced longitudinally disposed buckets extended between the spiders and positioned on one side of the axis of the rotor, said buckets being positioned to convey fluid upwardly and deposit the fluid at the upper side of the rotor, a washing and drying chamber substantially semi-circular in cross section, the bottom of said washing and drying chamber being substantially semi-circular in cross section and positioned with the inner surface thereof spaced from the peripheral surfaces of the spiders and buckets, spaced water tanks in the housing positioned below the bottom of the washing and drying chamber, heating elements in the space between the tanks for, selectively, heating water of the tanks or heating air passing through the area between the tanks, an article retaining member adapted to be suspended in the rotor, a worm gear mounted on the shaft and positioned in the gear compartment, a shaft rotatably mounted in the gear compartment, a worm positioned on the shaft, said shaft being positioned whereby the worm meshes with the worm gear, means for rotating the shaft, air circulating means actuated by the shaft, and means for circulating water from the tanks over articles in the rotor.

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