Nov. 30, 1954 K. CLARK 2,695,460

CLOTHES DRYING MACHINE

Filed Sept. 18, 1952 2 Sheets-Sheet 1

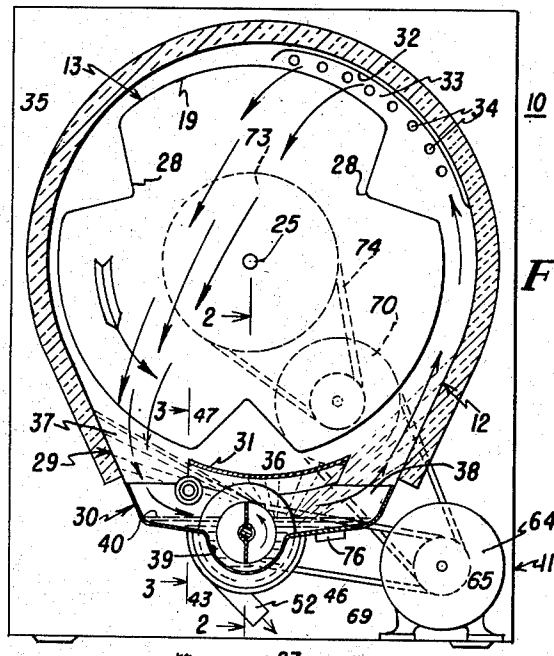


Fig. 1

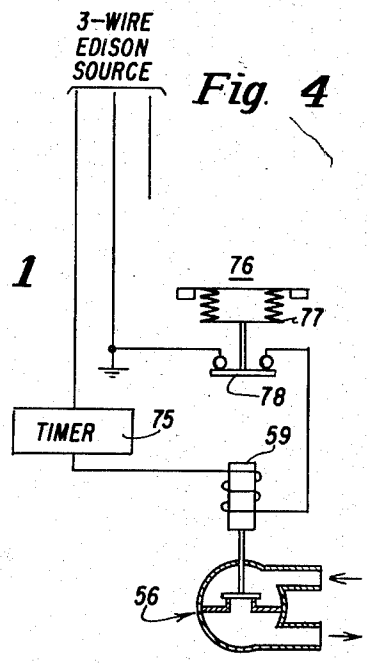


Fig. 4

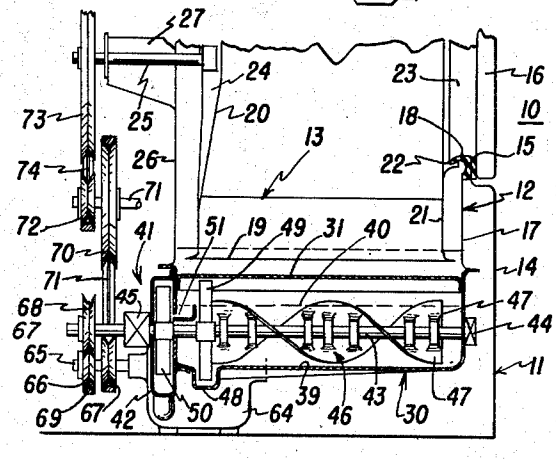


Fig. 2

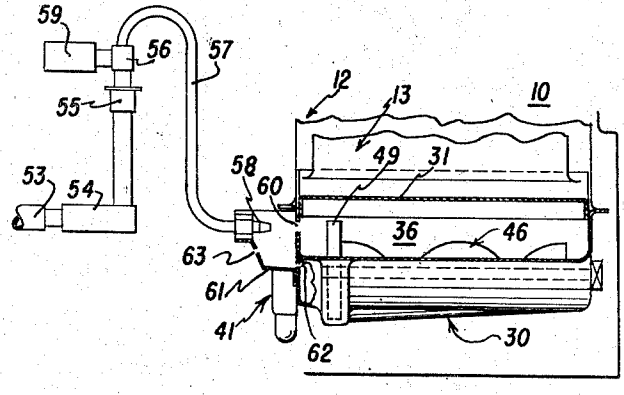


Fig. 3

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CLOTHES DRYING MACHINE

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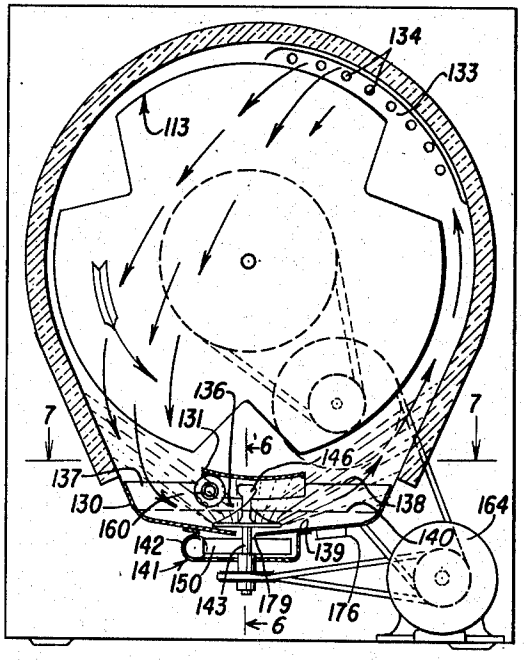


Fig. 5

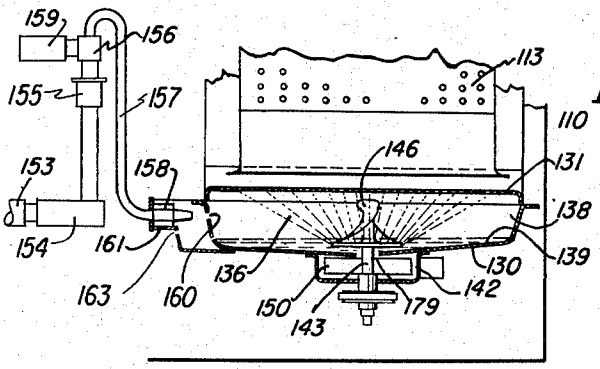


Fig. 6

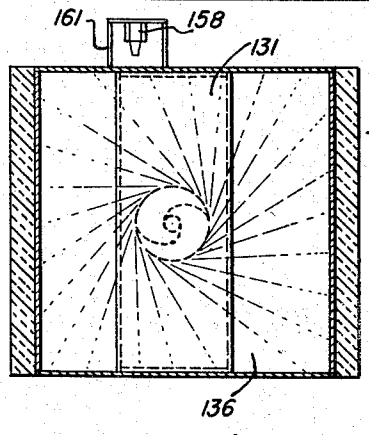


Fig. 7

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CLOTHES DRYING MACHINE

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15 Claims. (Cl. 34—75)

The present invention relates to improved clothes drying machines of the spray-condenser type.

A clothes drying machine of the type noted ordinarily comprises a substantially horizontally disposed and rotatably mounted drum adapted to receive clothes to be dried, wall structure cooperating with the drum and defining a passage communicating at the opposite ends thereof with two spaced-apart portions of the drum, the wall structure also defining spaced-apart heating and condensing chambers in the passage, as well as a sump disposed below the condensing chamber. The drum is rotated in order to tumble the contained clothes; and a current of air is circulated from the heating chamber through the drum into contact with the tumbling clothes and thence into the condensing chamber and back into the heating chamber. A heating unit is arranged in the heating chamber and is operative to heat the current of air passing therethrough; and a spray device is arranged in the condensing chamber and is operative to produce a spray of cool water therein in order to scrub the current of air passing therethrough so as to condense moisture and to remove lint therefrom, the water and the moisture and the lint accumulating in the sump. Further, an inlet conduit is operatively associated with the spray device and supplied with cool water under gauge pressure from the city water main; and a pump is provided that is operative to discharge to the exterior the water and the lint accumulating in the sump. Finally, the machine comprises an electric motor that is operative to rotate the drum and to produce the circulation of the current of air and to operate the pump.

In the operation of this machine, the spray of cool water in the condensing chamber is produced by converting the pressure head of the cool water in the inlet conduit into a corresponding velocity head, employing a nozzle, or the like; whereby the production of the spray of cool water in the condensing chamber is dependent entirely upon a proper gauge pressure of the cool water in the inlet conduit and consequently in the connected city water main. Thus in the event of a low gauge pressure of the cool water in the city water main, the overall operation of the machine is not satisfactory since the vaporizing-condensing cycle thereof is interrupted; whereby operation of the machine is not productive of the drying of the clothes, although the heating unit and the motor are operated. Moreover, the condition mentioned is not infrequent in some city water systems; and the condition may occur only during a short time interval in the cycle of operation of the machine, resulting in failure of the machine to dry the clothes in its operating cycle and leading the user to the erroneous conclusion that the machine is out-of-order.

Accordingly, it is a general object of the present invention to provide a clothes drying machine of the spray-condenser type, in which the production of the spray of cool water in the condensing chamber thereof is entirely independent of the pressure of the water in the connected water supply system.

Another object of the invention is to provide in a clothes drying machine of the type noted, an arrangement including a motor driven impeller for producing from a pool of cool water contained in a sump, a spray of the cool water in the condensing chamber disposed immediately thereabove in order that the current of air passing through the condensing chamber is thoroughly scrubbed by the spray of cool water so as to condense moisture and to remove lint therefrom, the moisture and the lint thus removed from the current of air accumulating in the water in the pool.

A further object of the invention is to provide in a clothes drying machine of the type noted, an arrangement of the character described, wherein the impeller also agitates the water in the pool contained in the sump so as to retain in suspension the lint contained therein.

Further features of the invention pertain to the particular arrangement of the elements of the clothes drying machine, whereby the above-outlined and additional operating features thereof are attained.

The invention, both as to its organization and method of operation, together with further objects and advantages thereof, will best be understood by reference to the following specification taken in connection with the accompanying drawings, in which

Figure 1 is a lateral sectional view of a clothes drying machine of the spray-condenser type embodying the present invention;

Fig. 2 is a fragmentary longitudinal sectional view of the lower portion of the machine, taken in the direction of the arrows along the line 2—2 in Fig. 1;

Fig. 3 is another longitudinal sectional view of the lower portion of the machine, taken in the direction of the arrows along the line 3—3 in Fig. 1;

Fig. 4 is a fragmentary electrical diagram of a portion of the control circuit of the machine;

Fig. 5 is a lateral sectional view of a modified form of the clothes drying machine embodying the present invention;

Fig. 6 is a fragmentary longitudinal sectional view of the lower portion of the machine, taken in the direction of the arrows along the line 6—6 in Fig. 5; and

Fig. 7 is a horizontal sectional view of the lower portion of the machine, taken in the direction of the arrows along the line 7—7 in Fig. 5.

Referring now to Figs. 1 to 3, inclusive, of the drawings, the clothes drying machine 10 there illustrated is of the home-laundry spray-condenser type and embodies the features of the present invention. Specifically, the machine 10 comprises an upstanding housing 11 that encloses an upstanding casing 12, that, in turn, encloses a substantially cylindrical clothes-receiving drum 13 that is mounted for rotation about its longitudinal axis disposed in a substantially horizontal position. The housing 11 includes a front wall 14 having a substantially annular front access opening 15 formed therein and carries a cooperating front door 16; while the casing 12 includes a front wall 17 having a substantially annular front access opening 18 formed therein and registering with the front access opening 15; and the drum 13 includes a substantially cylindrical perforated wall 19, a substantially circular imperforate rear end wall 20, and a substantially circular front end wall 21 having a substantially annular front access opening 22 formed therein and registering with the front access openings 15 and 18. Also a substantially annular flexible gasket 23, formed of rubber, or the like, is carried by the front walls 14 and 17, bounding the front access openings 15 and 18 and projecting into the front access opening 22. The rear end wall 20 of the drum 13 carries a spider 24, that, in turn, carries a stub shaft 25; and the casing 12 includes a rear wall 26 that carries a bearing 27 supporting the stub shaft 25. Further, the cylindrical side wall 19 of the drum 13 is provided with a plurality of inwardly directed imperforate clothes tumbling vanes 28, three of which are illustrated.

Further, the casing 12 is composed of complementary upper and lower sections 29 and 30 that are suitably detachably secured together; and a baffle 31 is arranged below the bottom of the drum 13 and extending between the front and rear walls 17 and 26. The general configuration of the side wall of the casing 12 is scroll-shaped so that it cooperates with the cylindrical side wall 19 of the drum 13 to provide a fan casing, whereby mere rotation of the drum 13 in the counterclockwise direction, as viewed in Fig. 1, brings about the circulation of a current of air through the drum 13 and through the casing 12. More particularly, a baffle 32 is arranged in the upper right quadrant of the casing section 29 and co-

operates therewith and with the associated cylindrical side wall 19 of the drum 13 to define a first or heating chamber 33 adjacent to the cylindrical side wall 19; which heating chamber 33 has a plurality of electric heating elements 34 disposed therein. In the arrangement, the baffle 32 also constitutes a heat reflector for the purpose of reflecting radiant heat from the electric heating elements 34 onto the cylindrical side wall 19 and through the perforations therein onto the clothes contained in the drum 13; and the upper casing section 29 carries an exterior layer of thermal insulation 35 for the purpose of preventing radiation therefrom and the consequent loss of heat in the housing 11. The lower casing section 30 cooperates with the baffle 31 to define a second or condensing chamber 36 therebetween; and the opposite ends of the baffle 31 terminate short of the adjacent side walls of the upper casing section 29 to define two spaced-apart and communicating passages 37 and 38 therebetween. The vanes 28 and the clothes, not shown, tumbling in the drum 13, as well as the cooperating configurations of the drum 13 and the casing 12 bring about the circulation of the current of air through the drum 13 and within the casing 12, as previously noted; whereby the current of air is circulated from the heating chamber 33 through the drum 13 into contact with the tumbling clothes therein, and thence via the passage 37 through the condensing chamber 36, and then via the passage 38 back into the heating chamber 34.

The current of air is heated and dried in the heating chamber 33 by the electric heating elements 34, whereby the clothes tumbling in the drum 13 are heated and dried by the current of air. In the condensing chamber 36 a spray of cool water is provided, as explained more fully hereinafter, whereby moisture contained in the current of air is condensed therefrom and accumulated in a longitudinally extending semi-cylindrical sump 39 formed in the bottom of the lower casing section 30. Also the spray of cool water in the condensing chamber 36 scrubs lint from the current of air circulated therethrough; whereby the water, the condensate and the lint accumulate in the sump 39, and specifically in a pool of water 40 that is maintained therein, as explained more fully hereinafter.

Also, the machine 10 comprises a pump 41 that is employed for the purpose of removing to the exterior of the sump 39 water and lint accumulating therein; which pump 41 includes a casing 42 carried by the rear end wall of the lower casing section 30. A longitudinally extending operating shaft 43 projects through the casing 42 of the pump 41 and through the lower section 30 of the casing 12 and is mounted adjacent to the opposite ends thereof for rotation in a pair of bearings 44 and 45 respectively carried by the front end wall of the lower casing section 30 and by the rear end wall of the casing 42. Arranged in the sump 39 is an elongated impeller 46 that is carried by the operating shaft 43 and provided with a pair of helical vanes 47. Arranged in an emboss 48 provided in the lower casing section 30 adjacent to the casing 42 of the pump 41 is an impeller 49 that is also carried by the operating shaft 43; and further an impeller or rotor 50 is carried by the operating shaft 43 and arranged in the casing 42 of the pump 41. Finally, the common end wall of the lower casing section 30 disposed between the sump 39 and the casing 42 of the pump 41 has a hole 51 arranged in the upper portion thereof and communicating between the sump 39 and the interior of the casing 42 in order to provide for the passage of the water and the lint from the pool 40 into the casing 42, as explained more fully hereinafter.

When the operating shaft 43 is rotated in the counterclockwise direction, as viewed in Fig. 1, the impeller 46 produces a spray of cool water in the condensing chamber 36 from the pool of water 40 that is maintained in the sump 39; the impeller 49 delivers some of the water and the lint from the pool 40 through the hole 51 into the casing 42 of the pump 41; and the rotor or impeller 50 in the casing 42 of the pump 41 discharges the water and the lint delivered thereto to the exterior via a discharge conduit 52 provided in the casing 42. In order to insure proper operation of the impeller 49 to deliver the water and the lint into the casing 42 of the pump 41, the helical vanes 47 of the impeller 46 are pitched in a direction so that the water and the lint in the sump 39 are moved toward the impeller 49 as a consequence of the rotation of the impeller 46.

Further, the machine 10 comprises a water supply system including an inlet conduit 53 that is adapted to be supplied with cool water under gauge pressure from the city water main, a communicating fixture 54 housing a strainer, not shown, a communicating flow regulator 55, a communicating control valve 56, a communicating tube 57, and a communicating jet nozzle 58. The control valve 56 is of the solenoid type being provided with an operating solenoid indicated at 59. A hole 60 is formed in the lower portion of the rear end wall of the lower casing section 30, below the baffle 31, and communicating with the condensing chamber 36, and horizontally aligned with respect to the jet nozzle 58. In the arrangement, the end of the jet nozzle 58 is displaced rearwardly from the hole 60 formed in the rear end wall of the lower casing section 30 by a distance of at least 1" and is carried by a substantially cup-shaped member 61 secured to the outer surface of the rear end wall of the lower casing section 30.

In the normal operation of the machine 10, cool water under gauge pressure is supplied to the inlet conduit 53 and passes through the fixture 54, wherein any foreign material therein is strained therefrom, and then flows via the flow control regulator 55 and the control valve 56 in its open position, and through the tube 57 into the jet nozzle 58. The flow control regulator 55 is preferably of the flexible diaphragm compression aperture or throat type and is designed to maintain a substantially constant flow of the cool water therethrough of approximately 0.4 gal./min., notwithstanding considerable variation of the gauge pressure of the cool water supplied to the inlet conduit 53. In the jet nozzle 58, the pressure head of the cool water is converted into a corresponding velocity head of the stream of cool water projected therefrom through the air gap disposed between the end of the jet nozzle 58 and the hole 60 formed in the rear end wall of the lower casing section 30 and thence through the hole 60 into the condensing chamber 36 below the baffle 31. This arrangement insures the continuous supply of cool water into the water in the pool 40 contained in the sump 39; however it is again noted that the spray of cool water in the condensing chamber 36 is produced fundamentally by rotation of the impeller 46, and the fundamental purpose of the stream of cool water is to maintain the water in the pool 40 in a cool condition. The rotation of the impeller 46 also agitates the water in the pool 40 so as to retain in suspension the lint accumulated therein, whereby the rotation of the impeller 49 continuously delivers the water and the suspended lint into the pump casing 42 so that the rotation of the rotor 50 in the casing 42 discharges the water and the lint delivered to the pump 41 to the exterior of the machine 10 through the discharge conduit 52.

During the operation of the machine 10, should the pressure of the cool water in the city water main become substantially reduced, the jet nozzle 58 may fail to produce a high velocity stream of water projected through the hole 60, but this is of no consequence as the low pressure stream of water projected through the hole 60 still enters the condensing chamber 36 for the purpose of retaining cool the water in the pool 40. Moreover in this event, should the jet nozzle 58 drip, the water is caught in the member 61 and enters the pool 40 through a hole 62 formed adjacent to the bottom of the member 61 in the rear end wall of the lower casing section 30. Further, another hole 63 is formed in the upper portion of the member 61 and communicating with the exterior for the purpose of positively preventing the accumulation of any head of water therein so that under no condition can the jet nozzle 58 become submerged in water contained in the member 61. In view of the foregoing, it will be understood that a low pressure of the cool water supplied from the city water main to the inlet conduit 53 does not cause improper operation of the machine 10 by virtue of the circumstance that the spray of cool water in the condensing chamber 36 is produced by the impeller 46 from the water in the pool 40 accumulated in the sump 39.

Now during the operation of the machine 10, should the abnormal condition appear of a subatmospheric pressure of the water in the connected city water main, there is a back-siphoning action through the inlet conduit 53 since the control valve 56 occupies its open position at this time. However, there is absolutely no back-siphoning of process water from the sump 39 under the

abnormal condition noted by virtue of the open air gap that is provided exteriorly of the casing 12 between the end of the jet nozzle 58 and the outer end of the hole 60 formed in the rear end wall of the casing 12. Specifically, the front end of the jet nozzle 58 is disposed at least 1" rearwardly of the adjacent hole 60.

For the purpose of rotating the stub shaft 25 and the operating shaft 43, an arrangement is provided that includes an electric motor 64 having an operating shaft 65 that carries two V-pulleys 66 and 67 on the outer end thereof. The pulley 66 is aligned with respect to a V-pulley 68 carried on the outer end of the operating shaft 43, the pulleys 66 and 68 being interconnected by an associated V-belt 69. The pulley 67 is aligned with respect to a V-pulley 70 carried on an idler shaft 71, the pulleys 67 and 70 being interconnected by an associated V-belt 71. Also a V-pulley 72 is carried by the idler shaft 71 that is aligned with respect to a V-pulley 73 that is carried on the outer end of the stub shaft 25, the pulleys 72 and 73 being interconnected by an associated V-belt 74. Accordingly, when the motor 64 is operated both the stub shaft 25 and the operating shaft 43 are rotated in the counterclockwise direction, as viewed in Fig. 1. This rotation of the stub shaft 25 effects rotation of the drum 13 and the consequent circulation of the current of air therethrough and through the casing 12, in the manner previously described; while this rotation of the operating shaft 43 causes the impeller 46 to produce the spray of cool water in the condensing chamber 36. Further, this rotation of the operating shaft 43 causes the impeller 49 to deliver the water and the lint from the pool 40 contained in the sump 39 into the casing 42 of the pump 41, whereby the rotating rotor or impeller 50 discharges the water and the lint from the casing 42 of the pump 41 to the exterior.

Further, the machine 10 is provided with an electric control circuit, a portion of which is indicated in Fig. 4; which circuit includes a three-wire Edison source and certain control elements including a timer 75 and a hydrostatic switch 76, as well as the solenoid 59 of the control valve 56. The hydrostatic switch 76 includes an expansible bellows 77 that communicates directly with an associated opening provided in the lower wall of the lower casing section 30, whereby the water in the pool 40 stands in the bellows 77. Also the hydrostatic switch 76 includes a contact bridging member 78 that controls a pair of contacts that are arranged in series relation with the solenoid 59 and the timer 75 across the power source. Thus it will be understood that in the cycle of the machine 10, the timer 75 closes the circuit for the solenoid 59, whereby the control valve 56 is operated from its normal closed position into its open position placing the inlet conduit 53 into communication with the jet nozzle 58 so that the stream of cool water from the city water main is projected through the hole 60 into the condensing chamber 36. In the operation of the machine 10, after a normal head of water is accumulated in the pool 40, the rate of removal of the water from the pool 40 by the impeller 49 is equal to the rate of supply of the water to the pool 40 from the jet nozzle 58. Toward the end of the cycle of the machine 10, the timer 75 opens the circuit for energizing the solenoid 59, whereby the control valve 56 is returned back into its normal closed position bringing about the cut off of the supply of water to the pool 40, whereby continued rotation of the impeller 49 effects emptying of all of the water and the lint from the pool 40 contained in the sump 39 into the pump 41 and the consequent discharge thereof to the exterior. Of course, at the conclusion of the cycle of the machine 10 operation of the motor 64 is arrested.

Further, it will be understood that in the operation of the machine 10, should an abnormal quantity of the water in the pool 40 accumulate in the sump 39 the head thereof standing in the bellows 77 brings about operation of the hydrostatic switch 76 so as to effect opening by the contact bridging member 78 of the associated pair of contacts and the consequent deenergization of the solenoid 59 resulting in closure of the control valve 56. This condition might arise in the operation of the machine 10 in the event of breakage of the belt 69. Accordingly, it will be understood that the arrangement of the hydrostatic switch 76 positively prevents the accumulation of an undue quantity of water in the pool 40 and the consequent flooding of the condensing chamber 36. For

example, the hydrostatic switch 76 may be set to be operated into its open position in response to a head of water in the pool 40 in excess of 3".

Referring now to Figs. 5, 6 and 7, of the drawings, the modified form of the clothes drying machine 110 there illustrated and embodying the features of the present invention is fundamentally identical to the machine 10 described in detail above, except that the operating shaft 143 that drives the impeller 146 disposed in the condensing chamber 136 and the rotor or impeller 150 of the pump 141 is disposed in a vertical position, rather than in a horizontal position. Thus in this form of the machine 110, the casing 142 of the pump 141 is arranged directly below the central portion of the sump 139 formed in the lower casing section 130; and a restricted opening 179 is formed in the lower central portion of the bottom wall of the lower casing section 130 in surrounding relation with respect to the operating shaft 143 and communicating between the sump 139 and the interior of the casing 142. Of course, the impeller 146 is disposed below the central portion of the baffle 131; and the hole 160 that is formed in the rear end wall of the lower casing section 130 is also arranged below the baffle 131 adjacent to one side of the impeller 146.

In the operation of the machine 110, the motor 164 effects rotation of the drum 113 in the counterclockwise direction, whereby the current of air is circulated from the heating chamber 133 through the drum 113 into contact with the clothes tumbling therein and thence via the passage 137 into the condensing chamber 136, and via the passage 138 back into the heating chamber 133 into contact with the heating elements 134. Of course, rotation of the operating shaft 143 by the motor 164 effects flinging of the water in the pool 140 contained in the sump 139 upwardly and outwardly in the radial direction, and the consequent production of a spray of cool water in the condensing chamber 136 so that the moisture and the lint is removed from the current of circulating air, and accumulated in the pool 140. Moreover, rotation of the impeller 146 tends to drive the water in the pool 140 outwardly away from the restricted opening 179 in order that water is maintained in the pool 140 in the sump 139; however, some of the water, as well as the lint suspended therein, escapes from the pool 140 in the sump 139 through the restricted opening 179 into the casing 142 of the pump 141 and is discharged to the exterior of the machine 110. Ultimately in the cycle of operation of the machine 110, when the supply of cool water via the hole 160 from the jet nozzle 158 is arrested, the water and the lint in the pool 140 gradually pass through the restricted opening 179 into the pump 141, and are discharged to the exterior of the machine 110, effecting complete emptying of the sump 139.

The machine 110 may be provided with a control circuit identical to that provided in the machine 10, a fragmentary portion of which is illustrated in Fig. 4, as previously described. In this arrangement, the hydrostatic switch 176 is provided with a flexible bellows, not shown, that communicates with an associated opening provided in the bottom wall of the lower casing section 130 so that the head of water in the pool 140 stands in the bellows mentioned, for the purpose previously explained; and of course, the pair of contacts, not shown, controlled by the hydrostatic switch 176 is included in the circuit for energizing the solenoid 159 of the control valve 156 for the purpose previously described.

In view of the foregoing, it will be understood that in each of the machines 10 and 110, rotation of the impeller provided in the sump disposed below the condensing chamber effects the production of a spray of cool water in the condensing chamber, whereby satisfactory operation of the machine is independent of the pressure of the water in the connected city water main.

While there has been described what is at present considered to be the preferred embodiment of the invention, it will be understood that various modifications may be made therein, and it is intended to cover in the appended claims all such modifications as fall within the true spirit and scope of the invention.

What is claimed is:

1. In a clothes drying machine including a substantially horizontally disposed and rotatably mounted drum adapted to receive clothes to be dried, means for rotating said drum in order to tumble the contained clothes, wall structure defining a passage communicating at the

opposite ends thereof with two spaced-apart portions of said drum, said wall structure also defining first and second spaced-apart chambers in said passage, said first chamber being disposed adjacent to the top of said drum and said second chamber being disposed adjacent to and below the bottom of said drum, said wall structure further defining a sump disposed below said second chamber, means for producing circulation of a current of air from said first chamber through said drum into contact with the contained clothes and thence into said second chamber and back into said first chamber, and means for heating said current of air as it is passed through said first chamber; the combination comprising means for introducing cool water into said sump in order to provide a pool of water therein, a rotatably mounted impeller arranged in said sump and at least partially immersed in the water in said pool, rotation of said impeller producing an upwardly directed and finely divided spray of cool water in said second chamber and effecting agitation of the water in said pool, means for rotating said impeller, means including a baffle disposed adjacent to the top of said second chamber and below said drum for preventing said spray of cool water in said second chamber from contacting said drum, said current of air being cooled and scrubbed by said spray of cool water as it is passed through said second chamber to effect the condensation of moisture and the removal of lint therefrom, the moisture and the lint thus removed from said current of air in said second chamber accumulating in the water in said pool, agitation of the water in said pool retaining the lint therein in suspension, a pump operative to discharge to the exterior water from said pool together with the lint suspended therein, and means for operating said pump.

2. The clothes drying machine combination set forth in claim 1, wherein said pump includes a rotor, and further comprising a common operating shaft for said impeller and said rotor.

3. In a clothes drying machine including a substantially horizontally disposed and rotatably mounted drum adapted to receive clothes to be dried, means for rotating said drum in order to tumble the contained clothes, wall structure defining a passage communicating at the opposite ends thereof with two spaced-apart portions of said drum, said wall structure also defining first and second spaced-apart chambers in said passage, said wall structure further defining a sump disposed below said second chamber, means for producing circulation of a current of air from said first chamber through said drum into contact with the contained clothes and thence into said second chamber and back into said first chamber, and means for heating said current of air as it is passed through said first chamber; the combination comprising means for introducing cool water into said sump in order to provide a pool of water therein, a first impeller arranged in said sump and mounted for rotation, rotation of said first impeller producing a finely divided spray of cool water in said second chamber, means for rotating said first impeller, said current of air being cooled and scrubbed by said spray of cool water as it is passed through said second chamber to effect the condensation of moisture and the removal of lint therefrom, the moisture and the lint thus removed from said current of air in said second chamber accumulating in the water in said pool, a pump operative to discharge to the exterior water and lint delivered thereto, means for operating said pump, a second impeller arranged in said sump and mounted for rotation, rotation of said second impeller delivering water and lint from said pool to said pump, and means for rotating said second impeller.

4. The clothes drying machine combination set forth in claim 3, wherein said pump includes a rotor, and further comprising a common operating shaft for said first and second impellers and said rotor.

5. In a clothes drying machine including a substantially horizontally disposed and rotatably mounted drum adapted to receive clothes to be dried, means for rotating said drum in order to tumble the contained clothes, wall structure defining a passage communicating at the opposite ends thereof with two spaced-apart portions of said drum, said wall structure also defining first and second spaced-apart chambers in said passage, said wall structure further defining an elongated sump disposed below said second chamber, means for producing circulation of a current of air from said first chamber through said drum into contact with the contained clothes and thence into said second chamber and back into said first chamber, and means for heating said current of air as it is passed through said first chamber; the combination comprising means for introducing cool water into said sump in order to provide a pool of water therein, an elongated impeller arranged in said sump and mounted for rotation, rotation of said impeller producing a finely divided spray of cool water in said second chamber, means for rotating said impeller, said current of air being cooled and scrubbed by said spray of cool water as it is passed through said second chamber to effect the condensation of moisture and the removal of lint therefrom, the moisture and the lint thus removed from said current of air in said second chamber accumulating in the water in said pool, a pump operative to discharge to the exterior water and lint delivered thereto, means for operating said pump, and means including said impeller for delivering water and lint from said pool to said pump.

6. The clothes drying machine combination set forth in claim 5, wherein said impeller includes a plurality of elongated and spirally disposed vanes, and the direction of rotation of said impeller is such that the water in said pool is moved by said vanes toward said pump by the mere rotation of said impeller.

7. In a clothes drying machine including a substantially horizontally disposed and rotatably mounted drum adapted to receive clothes to be dried, means for rotating said drum in order to tumble the contained clothes, wall structure defining a passage communicating at the opposite ends thereof with two spaced-apart portions of said drum, said wall structure also defining first and second spaced-apart chambers in said passage, said wall structure further defining a sump disposed below said second chamber, means for producing circulation of a current of air from said first chamber through said drum into contact with the contained clothes and thence into said second chamber and back into said first chamber, and means for heating said current of air as it is passed through said first chamber; the combination comprising an inlet conduit disposed exteriorly of said wall structure and supplied with cool water under pressure, said wall structure having a hole formed therein adjacent to said second chamber, means connected to said inlet conduit for projecting a stream of cool water therefrom through said hole into said second chamber and thence into said sump, a rotatably mounted impeller arranged in said sump, rotation of said impeller producing a finely divided spray of cool water in said second chamber and effecting agitation of the water in said pool, means for rotating said impeller, said current of air being cooled and scrubbed by said spray of cool water as it is passed through said second chamber to effect the condensation of moisture and the removal of lint therefrom, the moisture and the lint thus removed from said current of air in said second chamber accumulating in the water in said pool, agitation of the water in said pool retaining the lint therein in suspension, a pump operative to discharge to the exterior water from said pool together with this lint suspended therein, and means for operating said pump.

8. In a clothes drying machine including a substantially horizontally disposed and rotatably mounted drum adapted to receive clothes to be dried, means for rotating said drum in order to tumble the contained clothes, wall structure defining a passage communicating at the opposite ends thereof with two spaced-apart portions of said drum, said wall structure also defining first and second spaced-apart chambers in said passage, said second chamber being disposed adjacent to the top of said drum and said second chamber being disposed adjacent to and below the bottom of said drum, said wall structure further defining a sump disposed below said second chamber, means for producing circulation of a current of air from said first chamber through said drum into contact with the contained clothes and thence into said second chamber and back into said first chamber, and means for heating said current of air as it is passed through said first chamber; the combination comprising means for introducing cool water into said sump in order to provide a pool of water therein, a pump including a casing housing a rotor, means defining a conduit provided with an inlet and an outlet respectively communicating with said sump and with said casing, the inlet of said conduit being disposed above the bottom of said sump, a rotatably

mounted impeller arranged in said sump and at least partially immersed in the water in said pool, rotation of said impeller producing an upwardly directed and finely divided spray of cool water in said second chamber, means including a baffle disposed adjacent to the top of said second chamber and below said drum for preventing said spray of cool water in said chamber from contacting said drum, said current of air being cooled and scrubbed by said spray of cool water as it is passed through said second chamber to effect the condensation of moisture and the removal of lint therefrom, the moisture and the lint thus removed from said current of air in said second chamber accumulating in the water in said pool, rotation of said impeller also delivering water and lint from said pool into the inlet of said conduit to be conducted therethrough into said casing, means for rotating said impeller, rotation of said rotor pumping to the exterior water and lint delivered to said casing, and means for rotating said rotor.

9. In a clothes drying machine including a substantially horizontally disposed and rotatably mounted drum adapted to receive clothes to be dried, means for rotating said drum in order to tumble the contained clothes, wall structure defining a passage communicating at the opposite ends thereof with two spaced-apart portions of said drum, said wall structure also defining first and second spaced-apart chambers in said passage, said first chamber being disposed adjacent to the top of said drum and said second chamber being disposed adjacent to and below the bottom of said drum, said wall structure further defining a sump disposed below said second chamber, means for producing circulation of a current of air from said first chamber through said drum into contact with the contained clothes and thence into said second chamber and back into said first chamber, and means for heating said current of air as it is passed through said first chamber; the combination comprising means for introducing cool water into said sump in order to provide a pool of water therein, a rotatably mounted impeller arranged in said sump and at least partially immersed in the water in said pool, rotation of said impeller producing an upwardly directed and finely divided spray of cool water in said second chamber, means for rotating said impeller, means including a baffle disposed adjacent to the top of said second chamber and below said drum for preventing said spray of cool water in said second chamber from contacting said drum, said current of air being cooled and scrubbed by said spray of cool water as it is passed through said second chamber to effect the condensation of moisture and the removal of lint therefrom, the moisture and the lint thus removed from said current of air in said second chamber accumulating in the water in said pool, a pump operative to discharge to the exterior water and lint delivered thereto, means for operating said pump, and means for delivering water and lint from said pool to said pump.

10. In a clothes drying machine including a substantially horizontally disposed and rotatably mounted drum adapted to receive clothes to be dried, means for rotating said drum in order to tumble the contained clothes, wall structure defining a passage communicating at the opposite ends thereof with two spaced-apart portions of said drum, said wall structure also defining first and second spaced-apart chambers in said passage, said wall structure further defining a sump disposed below said second chamber, means for producing circulation of a current of air from said first chamber through said drum into contact with the contained clothes and thence into said second chamber and back into said first chamber, and means for heating said current of air as it is passed through said first chamber; the combination comprising means for introducing cool water into said sump in order to provide a pool of water therein, a rotatably mounted impeller arranged in said sump, rotation of said impeller producing a finely divided spray of cool water in said second chamber, means for rotating said impeller, said current of air being cooled and scrubbed by said spray of cool water as it is passed through said second chamber to effect the condensation of moisture and the removal of lint therefrom, the moisture and the lint thus removed from said current of air in said second chamber accumulating in the water in said pool, a pump provided with a casing housing a rotor, said casing being disposed below said sump, means for delivering water and lint from said pool to said casing, rotation of said rotor discharging to the exterior water and lint delivered to said casing, and means for rotating said rotor.

11. The clothes drying machine combination set forth in claim 10, and further comprising a common operating shaft for said impeller and said rotor.

12. In a clothes drying machine including a substantially horizontally disposed and rotatably mounted drum adapted to receive clothes to be dried, means for rotating said drum in order to tumble the contained clothes, wall structure defining a passage communicating at the opposite ends thereof with two spaced-apart portions of said drum, said wall structure also defining first and second spaced-apart chambers in said passage, said wall structure further defining a sump disposed below said second chamber, means for producing circulation of a current of air from said first chamber through said drum into contact with the contained clothes and thence into said second chamber and back into said first chamber, and means for heating said current of air as it is passed through said first chamber; the combination comprising means for introducing cool water into said sump in order to provide a pool of water therein, a rotatably mounted impeller arranged in said sump, rotation of said impeller producing a finely divided spray of cool water in said second chamber, said current of air being cooled and scrubbed by said spray of cool water as it is passed through said second chamber to effect the condensation of moisture and the removal of lint therefrom, the moisture and the lint thus removed from said current of air in said second chamber accumulating in the water in said pool, a pump provided with a casing housing a rotor, said casing being disposed below said sump, a common operating shaft for said impeller and said rotor, the bottom of said sump having a restricted opening formed therein and surrounding said operating shaft to accommodate the delivery of water and lint from said pool to said casing, rotation of said rotor discharging to the exterior water and lint delivered to said casing, and means for rotating said operating shaft.

13. In a clothes drying machine including a substantially horizontally disposed and rotatably mounted drum adapted to receive clothes to be dried, means for rotating said drum in order to tumble the contained clothes, wall structure defining a passage communicating at the opposite ends thereof with two spaced-apart portions of said drum, said wall structure also defining first and second spaced-apart chambers in said passage, said first chamber being disposed adjacent to the top of said drum and said second chamber being disposed adjacent to and below the bottom of said drum, said wall structure further defining a sump disposed below said second chamber, means for producing circulation of a current of air from said first chamber through said drum into contact with the contained clothes and thence into said second chamber and back into said first chamber, and means for heating said current of air as it is passed through said first chamber; the combination comprising a valve operative to control the introduction of cool water into said sump in order to provide a pool of water therein, means responsive to the quantity of water in said pool for selectively controlling the operation of said valve so as to maintain substantially a given quantity of cool water in said pool, a rotatably mounted impeller arranged in said sump and at least partially immersed in the water in said pool, rotation of said impeller producing an upwardly directed and finely divided spray of cool water in said second chamber, means for rotating said impeller, means including a baffle disposed adjacent to the top of said second chamber and below said drum for preventing said spray of cool water in said second chamber from contacting said drum, said current of air being cooled and scrubbed by said spray of cool water as it is passed through said second chamber to effect the condensation of moisture and the removal of lint therefrom, the moisture and the lint thus removed from said current of air in said second chamber accumulating in the water in said pool, a pump operative to discharge to the exterior water and lint delivered thereto, means for operating said pump, and means for continuously delivering to said pump water from said pool together with the lint therein.

14. The clothes drying machine combination set forth in claim 10, wherein said impeller is at least partially immersed in the water in said pool and is rotated about an upstanding axis so that said spray of cool water is thrown upwardly and outwardly from said pool into

said second chamber by said impeller incident to rotation thereof.

15. The clothes drying machine combination set forth in claim 10, wherein said impeller is arranged in said sump adjacent to the bottom wall thereof and at least partially immersed in the water in said pool and rotated about an upstanding axis so as to sweep some of the water in said pool out of the area disposed below said impeller and adjacent to said bottom wall, and wherein said means for delivering water and lint from said pool to said casing includes an opening through said bottom wall disposed below said impeller so that the flow of water and lint from said pool through said opening is retarded by the rotation of said impeller.

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