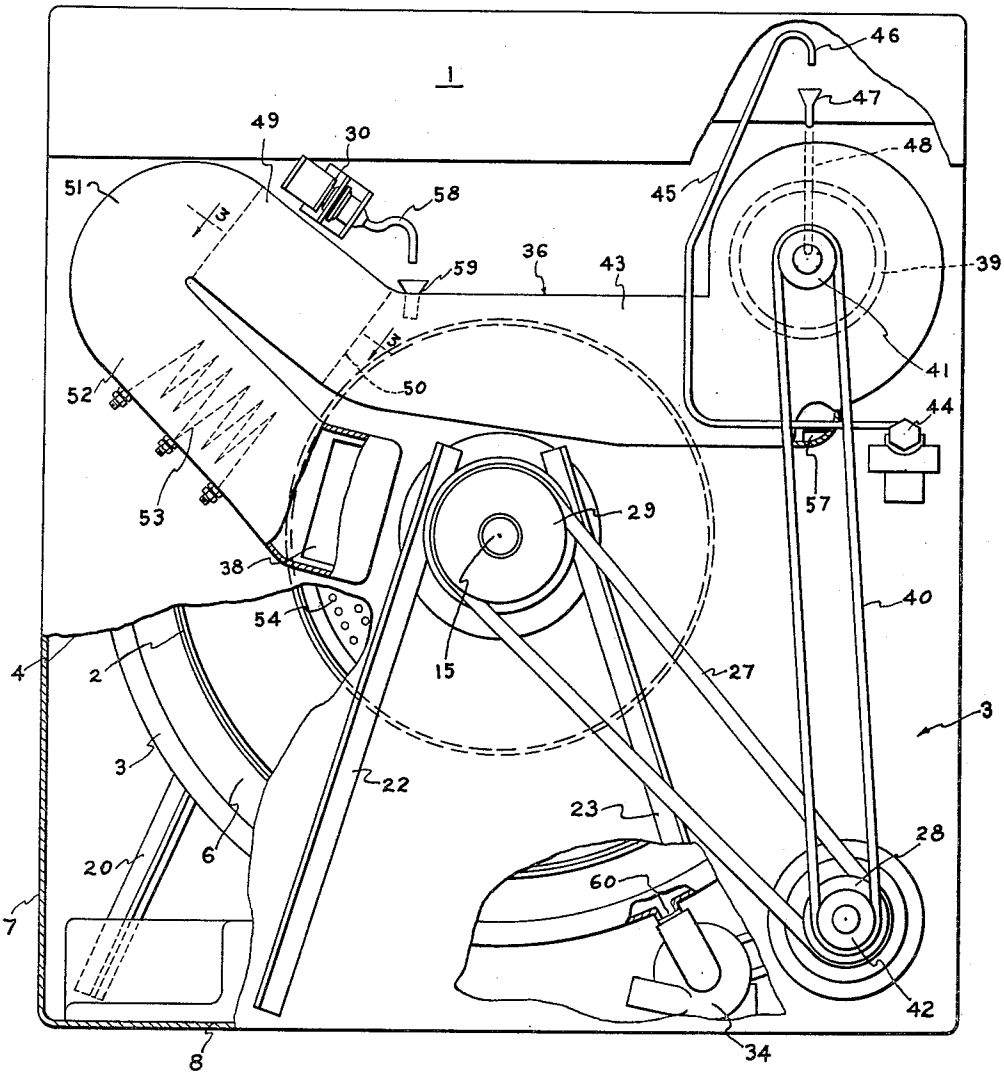
April 17, 1962 J. M. PINDER 3,029,525

CLOTHES DRYING MACHINE

Original Filed Sept. 5, 1956 2 Sheets-Sheet 1

FIG. 1



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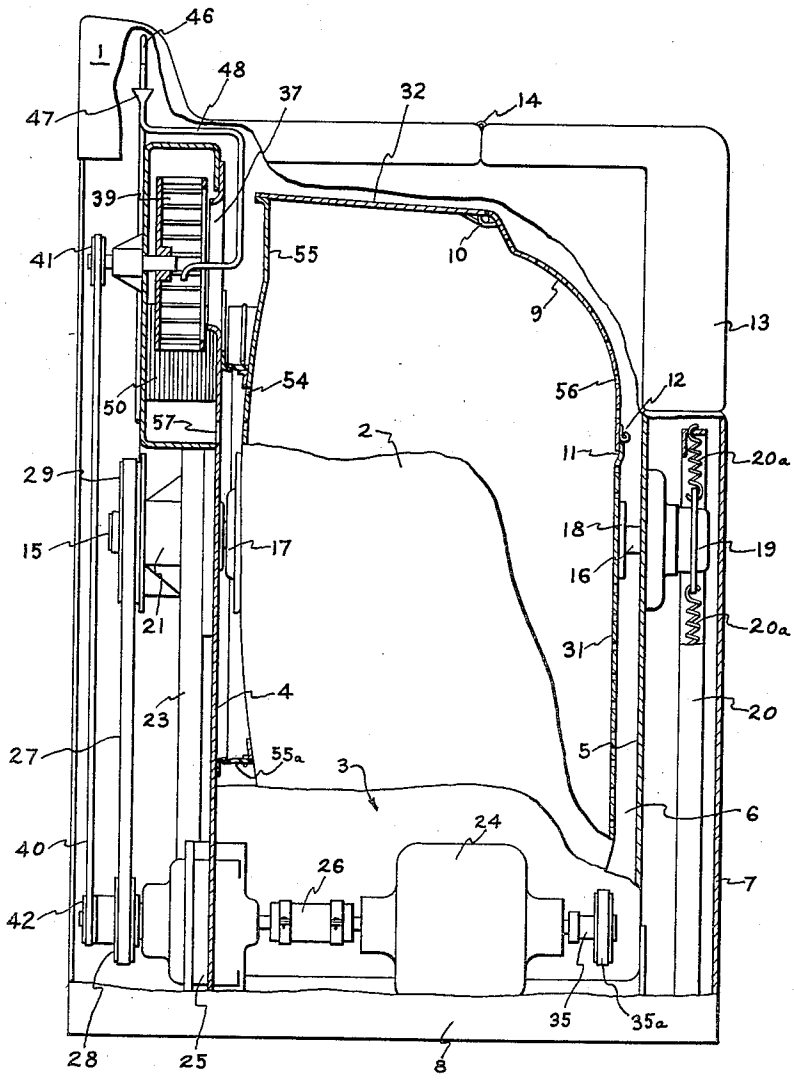
HIS ATTORNEY

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CLOTHES DRYING MACHINE

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FIG. 2



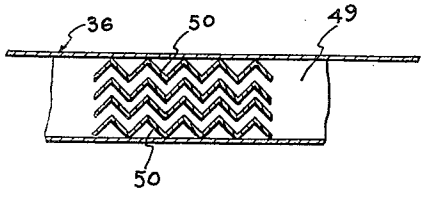


FIG. 3

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United States Patent Office 3,029,525 Patented Apr. 17, 1962

3,029,525

CLOTHES DRYING MACHINE

James M. Pinder, North Canton, Ohio, assignor to General Electric Company, a corporation of New York

Continuation of application Ser. No. 608,027, Sept. 5, 1956. This application Sept. 4, 1959, Ser. No. 838,357

5 Claims. (Cl. 34—75)

This application is a continuation of my application Serial No. 608,027, filed on September 5, 1956.

My invention relates to clothes drying machines and more particularly to such machines having a closed air recirculation system for extracting moisture from the clothes. By clothes drying machines I mean not only clothes dryers but also combination washer-dryers since my invention is applicable to both. My invention is, in fact, described in detail herein as embodied in a combination washer-dryer.

It is an object of my invention to provide a new and improved air recirculation system for clothes drying machines, in which the moisture absorbed from the clothes in the drying chamber is removed from the recirculated air with particular effectiveness.

Another object of my invention is to provide an improved means for introducing a condensing spray of cold water into the recirculation duct of a clothes drying machine, which means mechanically atomizes the condenser water and forceably mixes the droplets through the recirculation flow for cooling and scrubbing it.

A further object of my invention is to provide a clothes drying machine of the air recirculation type in which a single supply of condenser water is used to produce more than one condensing action, the water being used first within the recirculation system and later within the drying chamber itself.

In carrying out my invention I provide a clothes drying machine having clothes tumbling means disposed within a suitable drying chamber. For extracting moisture from the clothes being tumbled the machine is provided with a closed air recirculation system which continuously removes moist air from the drying chamber and returns dry air thereto. This recirculation system includes duct means and rotating air moving means. The duct means communicates with one region of the drying chamber at its one end and with a second region of the drying chamber at its other end, and the air moving means is effective to circulate air through the duct means from the one region of the chamber to the other. In order to condense the moisture from the moist air leaving the drying chamber, there is provided by my invention a new and improved condensing means for introducing a spray of cold condenser water into the air and mixing it thoroughly therethrough. This condensing means comprises a cold water inlet and the aforementioned air moving means. The cold water inlet is so arranged that it discharges a stream of cold water onto the air moving means as it rotates; and the air moving means by its rotation atomizes the stream of cold water and mixes the resulting droplets thoroughly through the recirculating air. The droplets cool and scrub the air and thereby remove moisture and lint from the air as it passes through the blower and duct means. As a result clean dry air is continuously returned to the drying chamber from the outlet of the duct means as moist lint laden air is drawn into the inlet. Suitable heating means are provided for heating the dry air so that it readily absorbs moisture from the clothes as it flows over them.

The subject matter which I regard as my invention is particularly pointed out and distinctly claimed in the concluding portion of this specification. My invention, however, both as to its organization and method of operation,

together with further objects and advantages thereof, may best be understood by reference to the following description taken in connection with the accompanying drawings in which:

FIG. 1 is a rear elevational view of a combination clothes washing and drying machine embodying my invention in one form thereof, the view being partially broken away to illustrate details;

FIG. 2 is a side elevational view of the machine of FIG. 1, the view being partially broken away and partially in section so as to show details; and

FIG. 3 is a fragmentary sectional view taken on the line 3—3 of FIG. 1.

Referring now to the drawings I have shown therein a combination clothes washing and drying machine **1** which embodies my invention in one preferred form thereof. The machine **1** includes a clothes basket **2** which is rotatable about a generally horizontal axis. The basket **2** is mounted within and enclosed by a imperforate tub structure **3** which includes a rear wall **4** and front wall **5** (FIG. 2). The walls **4** and **5** together with the other walls of the tub structure form a closed chamber **6** which serves as a water container during the washing operation of the machine and which serves as a drying chamber during the drying operation of the machine. The tub structure is itself enclosed within an outer appearance cabinet **7**. Both the tub structure and the appearance cabinet **7** are supported from and rigidly attached to the base **8** of the machine.

In order to provide for loading and unloading the machine, the clothes basket **2** is provided with a hinged door **9**. This door **9** is so arranged that the machine may be loaded and unloaded from the top, and specifically is mounted by means of a hinge structure **10** so that it swings inwardly when pushed by the operator. The door cannot spring outwardly from its illustrated closed position even during the operation of the machine because the free edge **11** thereof overlaps the front wall of the basket, and it is prevented from springing inwardly, except when actuated by the operator, by means of a spring clip **12**. To provide access to the upper end of the chamber **6** and thus to the basket door **8**, the outer cabinet structure **7** is provided with a generally L-shaped door **13**. This door **13** is suitably hinged as shown at **14** so that it may be manually lifted by the operator. Thus, to obtain access to the interior of the basket, the cabinet door **13** is first raised upwardly about its hinges **14** and then the door **9** is pressed inwardly swinging about its hinges **10**. Any suitable manually operated or automatic means may be used to align the door **9** with the door **13** for the loading and unloading processes.

Since the clothes basket **2** is of this top loading construction, it may be rotatably supported at both the front and rear thereof. In the illustrated embodiment the basket is supported by a drive shaft **15** at its rear end and by an idler shaft **16** at its front end. The rear wall of the basket is preferably connected to the drive shaft **15** by a suspension arrangement **17** whereby the basket may vibrate relative to the shaft **15** during the operation of the machine without transmitting appreciable vibrations to the shaft. One preferred suspension arrangement of this sort is shown in the co-pending application of William R. Buechler, S.N. 590,036, filed June 7, 1956, and assigned to the same assignee as the present invention. The idler shaft **16** is directly connected to the front wall of the basket by means of a plate **18** but it is resiliently supported so that even though it vibrates with the basket, the vibrations are not transmitted to the rest of the machine. The idler shaft may, for example, be rotatably supported by a bearing and seal assembly **19** which is supported from a fixed

frame of the machine 1 by means of a plurality of coil springs 20*a*. Mounted in this manner the vibrations of the idler shaft are taken up by the springs 20*a* without appreciable vibration being transmitted to the spring mounting members and the rest of the machine. Since the idler shaft 16 as shown extends through the front wall 5 of the tub, a flexible seal or boot (not shown) is secured between the bearing assembly 19 and the aperture in the front wall so as to seal off the chamber 6.

The drive shaft 15 unlike the shaft 16 is not mounted in a resiliently supported bearing. Rather it is mounted in an elongated bearing 21 which is fixedly supported by the means of the rear wall 4 of the tub and a pair of slanting frame members 22 and 23 (FIG. 1). A suitable shaft seal (not shown) is included within the bearing 21 to prevent leakage out of the chamber 6 through the bearing. During the operation of the machine the drive shaft 15 is driven by an electric motor 24 through a transmission assembly 25 (FIG. 2). The drive motor 24 is connected to the transmission 25 by a flexible coupling 26 and the transmission is in turn connected to the drive shaft by a belt 27. The belt 27 specifically is connected between an output pulley 28 of the transmission and a basket drive pulley 29 which is mounted on the drive shaft 15. The purpose of the transmission 25 is to provide two different speeds of rotation of the pulley 28 and thus of the drive shaft and the basket 2. When the transmission 25 is set at its one ratio, the basket is driven at a suitable speed for tumbling the cloths both for washing and for heat drying; and when the transmission is set at its second or higher ratio, the basket is driven at a suitable speed for centrifugally extracting water from the clothes. In other words the transmission by its two ratios provides for a tumble action and spin action. No particular transmission mechanism has been shown herein since it will be understood that any suitable transmission may be used.

In the operation of the machine 1 the clothes basket 2 is initially driven at tumble speed by the motor 24 and the transmission 25 so as to wash the clothes. Wash water is supplied to the chamber 6 and thus to the basket itself through solenoid actuated valve means 30 (see FIG. 1). The manner in which the valve means 30 supply water to the chamber 6 will be more fully explained hereinafter. It will be noted that both the front wall 31 and the front portion of the side wall 32 of the basket are perforated whereby when the chamber 6 is filled with water to the desired level, the water flows freely into the basket to wash the clothes therein.

After the clothes have been tumbled for a suitable period, for example 15 minutes, a suitable drain pump 34 (FIG. 1) is then actuated in order to drain the wash water from the tub. In the illustrated embodiment the drain pump is driven from the motor 24 through a clutch 35 and a belt and pulley drive 35*a*. The pump clutch 35 is solenoid controlled and during the washing operation it disengages the pump drive 35*a* from the shaft of the motor 24. However, when it is desired to drain the machine, the clutch is actuated and connects the drive 35*a* to the motor shaft so that the pump 34 is driven thereby.

During the period that the drain pump is operating so as to drain the chamber 6, the transmission 25 is shifted from the low speed ratio to its high speed ratio so that the basket 2 is driven at high speed. This high speed rotation of the drum results in the wash water being centrifugally extracted from the clothes. After this centrifugal extraction or spin stage has continued for a suitable length of time, the transmission is again shifted to its lower or tumble speed and the drain pump is inactivated. The chamber 6 is then filled with clean rinse water by means of the valve means 30 and the clothes are tumbled in the rinse water for a predetermined suitable period. After the clothes are thoroughly rinsed, the transmission 25 is again shifted to its high speed ratio and the clutch 35 is again operated so as to place the drain pump in operation. The basket is thus driven at high speed to centrifugally extract the rinse water from the clothes and the drain pump is operated to remove the rinse water from the machine.

Following the draining of the rinse water from the chamber 6, the machine then proceeds into a heat drying operation wherein the clothes are thoroughly dried by the passing of dry heated air over them. The dry heated air is supplied to the clothes by means of a closed, air recirculation system which continually removes moist air from one region of the chamber 6 while at the same time returning heated dry air to another region of the chamber. This closed, air recirculation system, which will now be described, comprises one important aspect of my invention.

The air recirculation system includes duct means which is connected at its opposite ends to different regions of the chamber 6, and it further includes air moving means for circulating air from the chamber through the duct means and back into the chamber again. The duct means, as generally indicated at 36, is positioned behind the rear wall 4 of the chamber 6 (see FIG. 1). The duct means includes an inlet 37 through the rear wall 4 in the upper region of the chamber 6 and it includes an outlet 38 through the rear wall 4 in the central region of the chamber 6. Immediately adjacent the inlet 37 there is positioned in the duct means the aforesaid air moving means comprising a centrifugal blower 39 (see FIG. 2). This blower 39 is driven from the output shaft of the transmission 25 by means of a belt 40. Specifically the belt 40 connects a pulley 41 on the blower drive shaft to a pulley 42 on the output shaft of the transmission 25. Driven in this manner by the transmission it will be seen that the blower 39 will be rotated whenever the basket 2 is rotated.

The blower 39 is effective to withdraw air continuously from the upper region of the drying chamber 6 during the drying operation. The blower 39 discharges this moist air into a generally horizontal section 43 of the duct means which extends across the back of the machine. The section 43, as will now be explained, comprises the primary condensing chamber of the recirculation system wherein the greater portion of the moisture contained in the moist air withdrawn from the chamber 6 is condensed out of it. The moisture specifically is condensed from the recirculating air in the duct section 43 by means of a spray of cold water which is introduced into the air and thoroughly mixed through it. By my invention the spray of cold water is introduced into the recirculating air in a manner which is particularly effective to mix the spray droplets through the air and condense the moisture therefrom. The means for introducing the condensing spray comprises the rotating air moving means or blower 39 itself. Specifically a metered flow of condenser water is introduced onto the blower, preferably at the center or eye thereof, and at the same time as it passes the air therethrough, the blower breaks up the condenser water into small droplets and mixes it thoroughly with the air.

The means for admitting the condenser water to the center of the blower may be best seen in FIG. 1. As there shown the condenser water inlet means includes a suitable solenoid operated valve 44 for passing a metered flow of water during the heat drying operation of the machine 1. From the valve 44 the condenser water flows through a line 45 to a nozzle 46. The nozzle 46 discharges across an air gap into a funnel 47 and from the funnel 47 the flow passes through a line 48 onto the blower at the center thereof. In other words the line 48 discharges the condenser water into the interior or eye of the blower. Being so discharged into the eye of the blower both the action of the blower blades themselves and the turbulence of the air passing through the blower break up the stream of condenser water into small drop-

lets, i.e. atomize the condenser water, and mix it thoroughly through the moist air.

As a result of the condenser water being mixed thoroughly through the recirculating air, the air is cooled to a temperature below its dew point as it passes through the blower and the horizontally extending section 43 of the duct means. With the air being so cooled below its dew point a large portion of the moisture it carries out the chamber 6 condenses and settles out of it in the section 43. Most of the droplets of condenser water themselves also settle out of the air as it passes through the section 43, the section 43 being of a relatively large cross sectional area so that the air velocity therein is relatively slow to permit the settling action. Thus the air is dehumidified to a great extent within the primary condensing section or chamber 43. In addition to the moisture removal action there is also a lint removal action within the chamber 43. Due to the introduction of the condensing spray into the air stream the lint particles carried by the air are wetted. The weight of the lint particles is of course greatly increased as they are wetted and therefore they tend to settle out of the air in the chamber 43.

After the air passes through the section 43 of the duct means, it then enters an upwardly inclined section 49 of the duct means. This inclined portion 49 of the duct means provides an additional moisture removing and lint collecting action. As best shown in FIG. 3 the section 49 includes therein a plurality of undulating or waved eliminator plates 50. These plates 50 together cause the air to flow in a serpentine path as it moves through the section 49. In other words the air as it passes through the baffles 50 must change its direction sharply several times. This provides a droplet eliminating and lint removing effect. In other words the remaining water droplets and particles of wet lint are centrifuged out of the air as it passes through the section 49.

From the section 49 the recirculating air then passes through an elbow 51 of the duct means into a downwardly extending section 52 of the duct means. The section 52 as shown includes an electrical heating means 53 whereby now dry air is heated. The heater 53, which may be of any suitable type, thoroughly heats the air as it passes through the section 52. From the section 52 the dry heated air is discharged from the duct means back into the chamber 6 through the opening 38 in the rear wall 4 of the tub.

The dry heated air returned to the chamber 6 from the recirculation system then passes through the basket 2 to extract moisture from the clothes therein. The air flows from the opening 38 into the basket through the holes 54 in the rear wall 55 thereof. It will be noted that an annular air seal 55*a*, preferably formed of some flexible material such as rubber, is disposed between the rear wall 4 of the chamber 6 and the rear wall 31 of the basket 2 to prevent short circuiting of the air directly from the duct outlet 38 to the duct inlet 37. After entering the basket 2 through the openings 54 the air then passes through the basket toward the front end thereof. During its passage through the basket the air of course absorbs moisture from the clothes, becoming more moist as its passage continues. At the front of the basket the moist air is discharged through the perforations 56 into the chamber 6, and it then flows around the outside of the basket to the inlet 37 of the air recirculation system. The same dehumidifying and reheating cycle is thereupon repeated by the recirculation system, and in this manner a continuous supply of warm dry air is passed through the clothes to dry them during the drying operation.

In order to remove the condenser water and the condensed moisture from the section 43 of the duct means during the drying operation, the section 43 is provided with a drain 57 at the lower right hand end thereof as viewed in FIG. 1. This drain 57 comprises an aperture through the rear wall 4 of the chamber 6 and it passes the condenser water and the condensed moisture into the chamber 6. Specifically the water after passing through the drain aperture 57 then runs or trickles down the rear wall of the chamber 6. This trickle or film passing down the rear wall of the chamber provides an additional condensing action. It cools the region of the rear wall 4 over which it passes and thereby provides a cold surface within the chamber itself on which moisture may condense. As the moist air is drawn over this surface in moving to inlet 37, a certain portion of the moisture given off within the basket 2 passes to this cold surface and is condensed by it. Although this secondary condensing effect does not, of course, produce so great a condensing action as that produced by the spray set up by the blower 39, it nonetheless condenses enough moisture to add to the efficiency of the machine 1 during the drying operation. Incidentally it will be noted that the inclined section 49 of the duct means drains into the duct section 43 and thence through the aperture 57 so that any moisture and spray water removed in the section 49 aids that removed in the section 43 in producing this cold wall condensing effect.

In addition to serving as a drain for the chamber 43 during the drying operation, the aperture 57 also serves as a means whereby the wash and rinse water is admitted to the machine. As mentioned above, the inlet water valve means 30 are mounted on the rear wall 4 of the tub structure. The water valve means, which preferably include both a hot water valve and a cold water valve, discharge through common outlet 58. This outlet 58 in turn discharges the inlet water across ain air gap into a funnel 59 which passes the water into the section 43 of the duct means. From the inlet funnel 59 the water then flows along the length of the duct means to the aperture 57 and passes through it into the chamber 6 of the tub structure. As a result of the passage of the inlet water through the section 43, any lint collected on its walls during the drying operation is washed down and passed into the chamber 6 for removal by the drain pump. Normally the aperture 57 is effective to pass the water inlet flow into the tub substantially as fast as it is admitted by the valve 30. If, however, the water should back up within the duct structure and tend to fill it up, overflowing of the machine still cannot occur. The lower edge of the air inlet 37 to the duct means is lower than the top of the funnel 59 and thereby if a pool of water is formed within the duct means, it will spill over through the blower inlet into the chamber 6 rather than overflowing from the machine. Also, if the blower is running, its action will result in some of the pool being forced upwardly through duct section 49 and thence through elbow 51, section 52 and aperture 38 into the tub.

Besides the above described condensing actions produced by the introduction of the condenser water onto the blower 39, and by flowing the condenser water and condensate down the back wall 4 of the drying chamber 6, by my invention still another condensing action is produced in the machine 1 during the drying operation. In accordance with my invention this third condensing action is produced within the drying chamber itself and is obtained by causing a puddle of condenser water and condensate to be formed in the bottom of the chamber. This puddle is created by connecting the drain pump 34 to the chamber 6 somewhat above the bottom of the tub. The inlet 60 to the pump, as shown in FIG. 1, extends through the side wall of the tub slightly above its lowest point, and as a result of this construction a puddle equal in depth to the height of the inlet above the tub bottom is formed in the chamber 6 during the drying operation. The puddle is, of course, formed by the condensate and condenser water that has trickled down the back wall of the tub. The puddle being somewhat cooler than the moist air leaving the lower portion of the

drum produces some condensing action as that air flows rearwardly over it to reach the blower inlet 37. This condensing action aids the other two actions in effectively removing from the air the moisture absorbed during its passage through the drum 2.

Incidentally, it will be noted that since the blower 39 is driven continuously, it rotates during the washing operation as well as during the drying operation. However, it has been found that its action during the washing operation can be used in conjunction with the heaters to heat the wash water and does not detract in any way from the efficiency of the washing operation.

To sum up briefly the operation of my new and improved air recirculation system included within the machine 1, consider a quantity of moist air entering the blower 39 through the inlet 37 in the rear wall 4 of the tub. This moist air is forced by the blower into the primary condensing region 43 of the duct means where the air is thoroughly mixed with a cold water spray obtained by introducing water through the valve 44 and its connected lines into the center of the blower 39. The blower 39 by its rotation and by the turbulence of the air passing therethrough breaks the water down into small droplets and mixes it thoroughly with the air. As a result, in the blower and the condensing region 43 the air is cooled to a temperature below its dew point and water vapor is condensed out of it. In other words the air is dehumidified. At the same time the lint particles carried by the air are wetted and due to their increased weight settle out of the air stream.

After leaving the chamber 43 the air then passes over the eliminator plates 50. Here the air is forced to change direction sharply several times thereby centrifuging out the remaining particles of wet lint and water droplets. The air is now relatively dry and lint free as it approaches the electrical heater 53. The dry air is then heated by the heater assembly and next passes through the outlet 38 and the basket holes 54 into the basket itself. The air seal 55 insures that the heated air passes into the basket and does not short circuit directly back into the blower inlet. After giving up its heat to vaporize the water in the clothes the now cool and humid air passes out through the holes 56 in the front of the basket and flows back to the inlet 37 of the blower to once again be dehumidified and heated for further moisture extraction from the clothes.

Concurrently with the condensing effect produced by the blower 39 a secondary condensing effect is being created due to the tricking of the condenser water and the condensed moisture down the back wall of the tub; and further, the puddle produced at the bottom of the tub by the inlet arrangement of the drain pump provides still another condensing action. These condensing actions within the drying chamber added to the main condensing action of the blower provide a particularly effective moisture removal system whereby the utmost condensing effect is obtained from the single supply of condenser water.

While in accordance with the patent statutes I have described what at present is considered to be the preferred embodiment of my invention it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the invention, and it is, therefore, aimed in the appended claims to cover all such equivalent variations as fall within the true spirit and scope of the invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A clothes drying machine comprising a drying chamber, clothes tumbling means disposed within said chamber, duct means communicating at one end with one region of said chamber and at its other end with a second region of said chamber, rotating air moving means for circulating air from one region of said chamber through said duct means to said second region of said chamber, condenser means for introducing a spray of cold water into said air as it passes through said duct means to condense moisture therefrom, said condenser means comprising a cold water inlet for discharging a stream of cold water onto said air moving means whereby said air moving means serves to atomize said water and mix it through said air, a drain from said duct means for carrying off the spray water and the moisture condensed from said air, said drain discharging onto a wall of said drying chamber whereby the spray water and condensed moisture flow down said wall to produce a cold wall condensing action within said chamber, and a heater for heating the air passing through said chamber to extract moisture from the clothes being tumbled.

2. A clothes drying machine comprising a drying chamber, clothes tumbling means disposed within said chamber, duct means communicating at one end with one region of said chamber and at the other end with a second region of said chamber, rotating air moving means for circulating air from said one region of said chamber through said duct means to said second region of said chamber, condenser means for introducing a spray of cold water into said air as it passes through said duct means to condense moisture therefrom, said condenser means comprising a cold water inlet for discharging a stream of cold water onto said air moving means whereby said air moving means serves to atomize said cold water and spray it through said air, said duct means including a generally horizontal section adjacent said blower means and an upwardly inclined section downstream of said horizontal section, said horizontal section forming a primary condensing chamber, and said inclined section including baffle means for mechanically removing any spray water and moisture remaining in said air, said inclined section draining into said horizontal section, a drain from said horizontal section for carrying off the spray water and moisture condensed from said air, said drain discharging onto a wall of said drying chamber whereby the spray water and condensed moisture flow down said wall to produce a cold wall condensing action within said chamber, and a heater disposed within said duct means downstream of said baffles for heating said air prior to its return to said chamber.

3. A clothes drying machine comprising a drying chamber, a clothes tumbling basket positioned within said chamber, at least a portion of both the front wall and the rear wall of said basket being perforated, duct means communicating at both ends with said chamber through the rear wall thereof, the inlet of said duct means communicating with the upper region of said chamber, and the outlet of said duct means communicating with the central region of said chamber, rotating air moving means for circulating air from said upper region of said chamber through said duct means to said central region of said chamber, air sealing means extending between said rear wall of said chamber and said rear wall of said basket for passing the air discharged from said outlet of said duct means directly into said basket through the perforations in said rear wall thereof, said air being discharged from said basket through the perforations in the front wall thereof and thence flowing through said chamber to said inlet of said duct means, whereby a continuous circulation of air is created through said basket, condenser means for introducing a spray of cold water into the moist air entering said duct means from the upper region of said chamber thereby to condense the moisture from said air, said condenser means comprising a cold water inlet discharging cold water onto said air moving means whereby said air moving means atomizes said cold water and mixes it through said moist air, a plurality of baffles positioned in said duct means downstream of said air moving means and forming a serpentine passage therein for further removing the moisture from the air, and a heater disposed in said duct down-

stream of said baffles for heating said air prior to its return to said chamber.

4. A clothes drying machine comprising a drying chamber, clothes tumbling means disposed within said chamber, duct means communicating at one end with one region of said chamber and at the other end with a second region of said chamber, rotating air moving means for circulating air from said one region of said chamber through said duct means to said second region of said chamber, condenser means for introducing a spray of cold condenser water into said air as it passes through said duct means to condense said moisture therefrom, said condenser means comprising a cold water inlet for discharging a stream of cold condenser water onto said air moving means whereby said air moving means serves to atomize said water and mix it through said air, a drain from said duct means for draining the sprayed condenser water and the moisture condensed from said air into said drying chamber, means for causing the formation of a puddle of said condenser water and condensed moisture at the bottom of said chamber thereby to produce an additional condensing action within said chamber, and a heater for heating the air entering said chamber to extract said moisture from the clothes being tumbled.

5. A clothes drying machine comprising a drying chamber, clothes tumbling means disposed within said chamber, duct means communicating at one end with one region of said chamber and at the other end with a second region of said chamber, rotating air moving means for circulating air from said one region of said

chamber through said duct means to said second region of said chamber, condenser means for introducing a spray of cold water into said air as it passes through said duct means to condense moisture therefrom, said condenser means comprising a cold water inlet for discharging a stream of cold condenser water onto said air moving means whereby said air moving means serves to atomize said water and mix it through said air, a drain from said duct means for carrying off the sprayed condenser water and moisture condensed from said air, said drain discharging onto a wall of said drying chamber whereby the condenser water and condensed moisture flow down said wall to produce a cold wall condensing action within said chamber, means for causing the formation of a puddle of said condenser water and condensed moisture at the bottom of said chamber thereby to produce an additional condensing action within said chamber, and a heater for heating the air entering said chamber to extract moisture from the clothes being tumbled.

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