

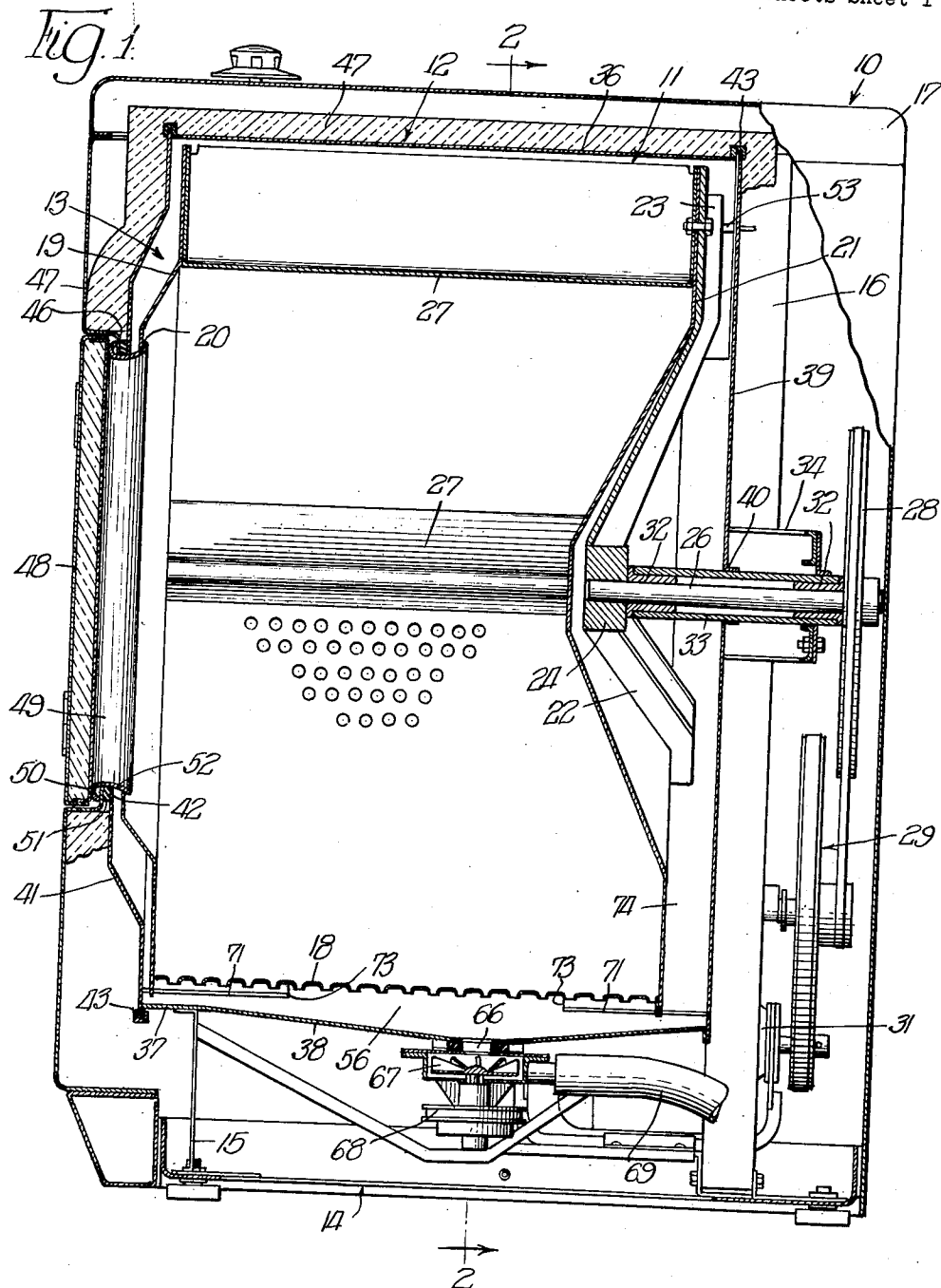
June 15, 1954

T. R. SMITH
CLOTHES DRIER

2,680,915

Filed Feb. 5, 1953

3 Sheets-Sheet 1



INVENTOR.
Thomas R. Smith,
BY
Wilkinson Harley Byers & Howe
ATTORNEYS.

June 15, 1954

T. R. SMITH
CLOTHES DRIER

2,680,915

Filed Feb. 5, 1953

3 Sheets-Sheet 2

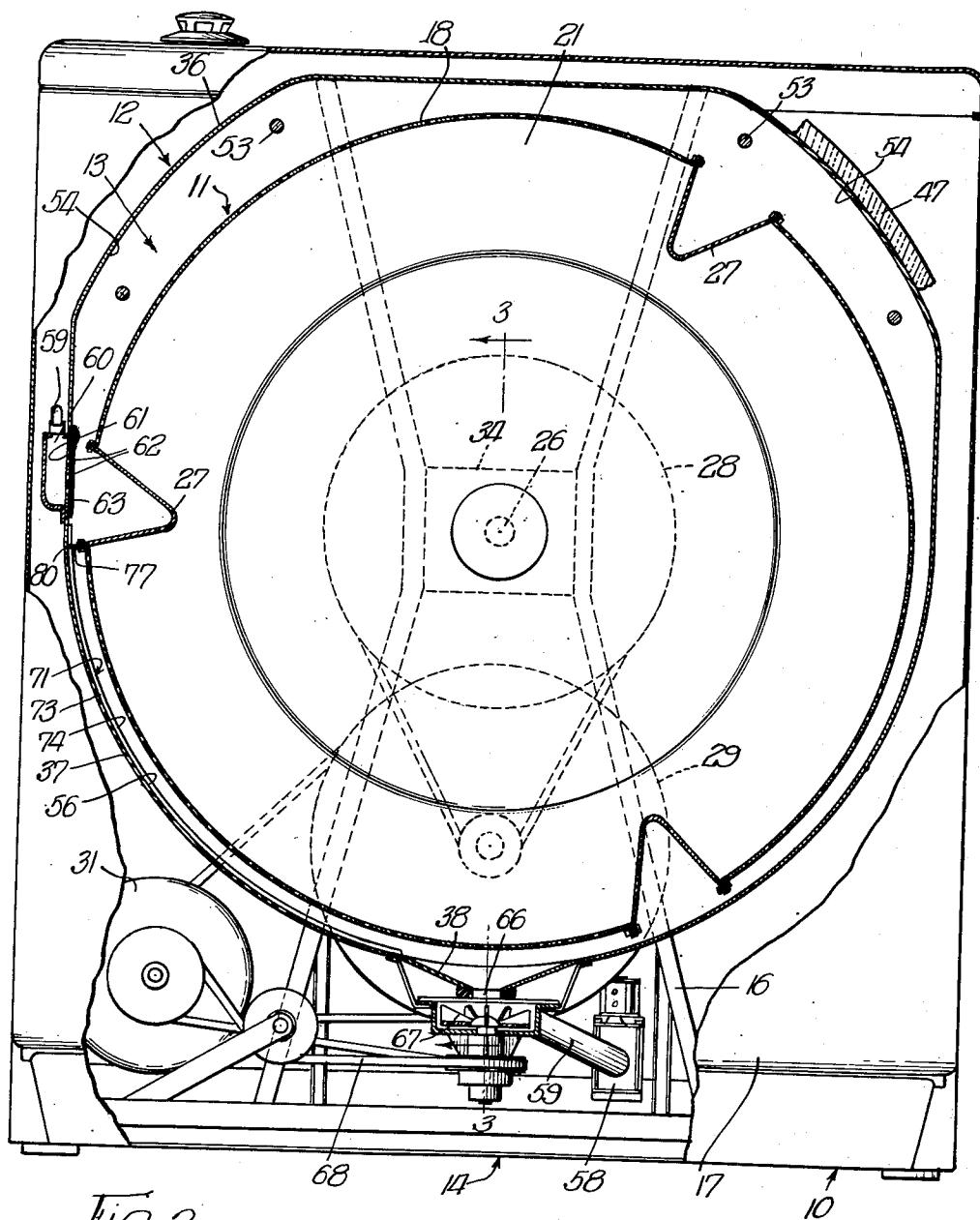


Fig. 2

INVENTOR
Thomas R. Smith,
BY
Wilkinson Harley Byrd & Hume
ATTORNEYS.

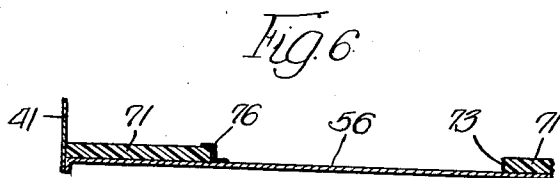
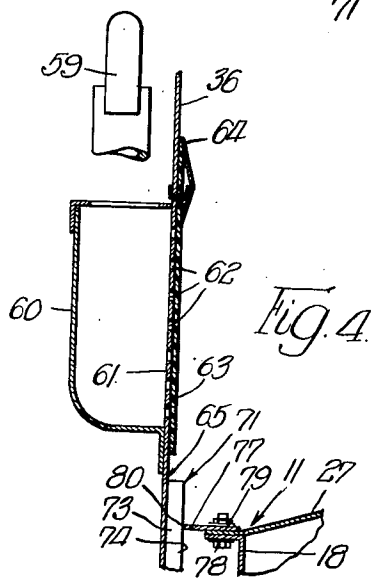
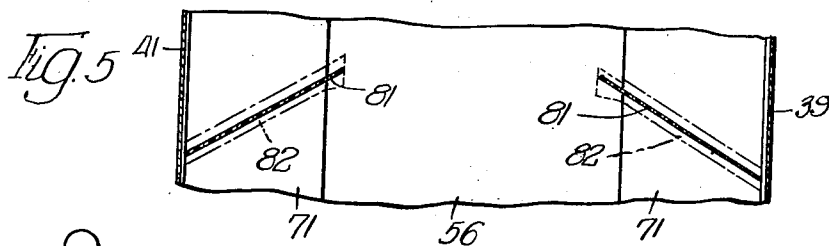
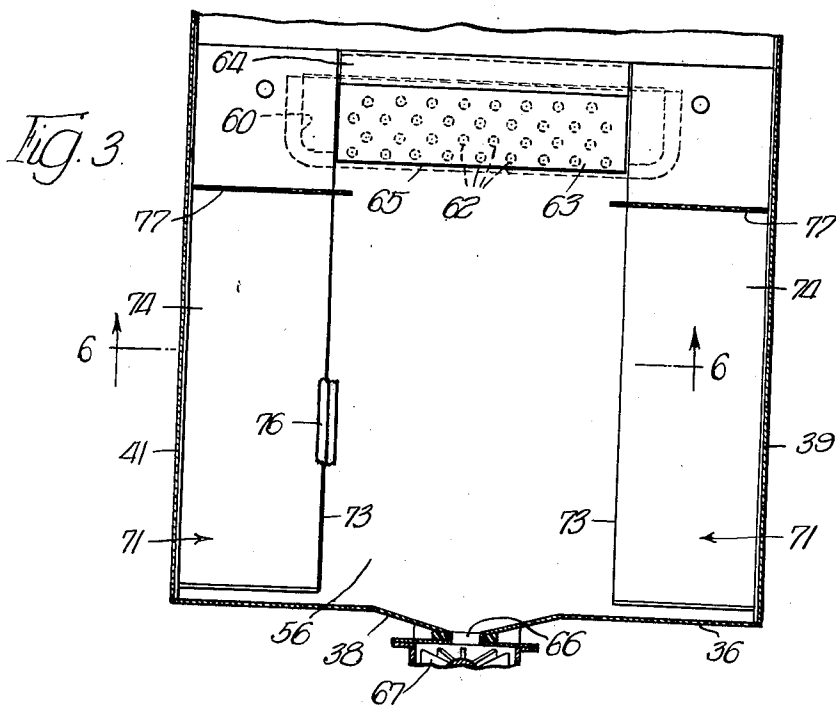
June 15, 1954

T. R. SMITH
CLOTHES DRIER

2,680,915

Filed Feb. 5, 1953

3 Sheets-Sheet 3



INVENTOR.
Thomas R. Smith,
BY
Wilkinson Huxley Bryan & Howe
ATTORNEYS

UNITED STATES PATENT OFFICE

2,680,915

CLOTHES DRIER

Thomas R. Smith, Newton, Iowa, assignor to The
Maytag Company, Newton, Iowa, a corporation
of Delaware

Application February 5, 1953, Serial No. 335,184

10 Claims. (Cl. 34—75)

1

The invention relates to clothes driers and more particularly to clothes driers of the tumbler type incorporating a vapor condensing area. As to all common subject-matter it is a partial continuation of my copending application, Serial No. 259,580, filed December 3, 1951, for Clothes Drier.

In the operation of clothes driers, the accumulation and disposition of lint shaken from the fabrics being dried is a troublesome problem, especially so with the type of clothes drier which uses a cold wall or section for condensing the vapor evaporated from the clothing during the drying operation. In constructions of this type an area about the condensing section has a tendency to be cooled to a temperature below the dew point of the vapor, with the result a certain percentage of the vapor condenses thereat and any lint falling on this cool moist surface is retained and begins to collect or accumulate thereon. Alternate moistening and drying of the lint tends to mat the same as it accumulates and eventually it may cause malfunction of the drier, and also result in odors should bacteria form in the moist collected lint.

In accordance with the invention, a tumbler type clothes drier is provided which comprises a horizontally rotatable drum mounted in a substantially imperforate stationary casing. A heating element is disposed within the casing to evaporate the moisture in the clothing and one section of the lower wall of the casing is cooled by means of a thin film of water flowing downwardly over the inner surface or periphery to provide a condensing section or area for condensing the vapor evaporated from the clothing. Since this area or surface provides the coldest point in the casing, the flow of vapor will naturally be in the direction of the condensing area whereat it will condense and flow along with the cooling water to drain. At the same time, the air or vapor-borne lint will move along with the vapor, contact the condensing area and be discharged to drain also. A pair of parallel spaced arcuate thermal insulating strips are secured to the inner periphery of the casing on opposite sides of the downwardly flowing water to define a channel for the condensing water, and also insulate the surrounding area of the casing to define a relatively sharp line of demarcation for the temperature between the condensing area and the remainder of the casing. In addition, the thermal insulating strips tend to absorb radiant heat to further increase the temperature difference between the two areas.

While a major portion of the lint will move to the condensing area, there still is a tendency for a small portion of the lint to collect on the ther-

2

mal strips. To eliminate this as a lint problem, radially outwardly projecting wiping or scraping members are mounted on the outer periphery of the drum which are adapted to contact the exposed surface of the thermal strips upon each revolution and move any lint falling thereon downwardly, whereat it is moved into a catch basin and discharged to drain along with the condensate and condensing water.

Accordingly, it is one of the objects of the invention to provide a tumbler type clothes drier having a casing with a liquid cooled vapor condensing surface therein which has spaced strips to define a channel for the condensing liquid.

It is another object of the invention to provide a tumbler type clothes drier having a casing with a liquid cooled section which is confined to a definite channel by a pair of spaced thermal insulating strips.

It is still another object of the invention to provide a clothes drier having a closed casing with a liquid cooled vapor condensing section therein which has a pair of spaced thermal insulating strips on either side of the condensing section to restrict the condensation of vapor thereto.

It is yet another object of the invention to provide a clothes drier including a sealed casing having a water cooled condensing section therein and a clothes tumbling drum which is provided with wiper members for removing the lint collecting adjacent the condensing section.

It is another object of the invention to provide a clothes drier including a sealed casing having a liquid cooled condensing section defined by spaced thermal insulating strips and a rotatable tumbling drum therein with wiping members secured thereto which engage the thermal strips to remove lint therefrom.

It is still another object of the invention to provide a tumbler type clothes drier having a sealed casing which is compact and wherein the evaporating and condensing operations take place within the casing and the lint is removed from the area surrounding the condensing section and flushed to drain.

Other objects, features, capabilities and advantages are comprehended by the invention, as will later appear and as are inherently possessed thereby.

Referring to the drawings:

Figure 1 is a longitudinal vertical sectional view of a tumbler type clothes drier having the improved thermal insulating strips and lint removing members attached thereto;

Figure 2 is a transverse vertical sectional view

3
of the clothes dried taken generally along the line 2—2 of Figure 1;

Figure 3 is a view taken generally along the line 3—3 of Figure 2, with the drum removed, showing more in detail the liquid cooled condensing section and thermal strips;

Figure 4 is an enlarged detail sectional view of the condensing water inlet and wiping members passing over the thermal strips as shown in Figure 2;

Figure 5 is a fragmentary plan view showing the wiping members disposed at an angle with respect to the axis of the drum and the thermal insulating strips; and

Figure 6 is a fragmentary cross-sectional view taken along line 6—6 of Figure 3.

Referring now more in detail to the drawings for an embodiment selected to illustrate the invention, there is shown a tumbler type clothes drier 10 having a horizontally mounted rotatable drum 11 enveloped or encompassed by a substantially imperforate stationary sheet metal casing or container 12 providing a drying chamber 13 in which the drum 10 rotates. The container or casing is suitably supported on a base frame 14 by means of a transverse web 15 located adjacent its forward portion and an upwardly directed box or channel structure 16 carried at its back portion and the entire assembly is surrounded by a cabinet construction 17 to provide a pleasing appearance.

The drum 11 includes an outer perforate cylindrical wall 18, a front wall 19, having an access opening 20 therein through which the clothing to be dried is inserted and removed, and an imperforate rear wall 21. A supporting spider construction 22 has its outer ends 23 secured to the rear wall 21 adjacent the outer periphery of the drum and its innermost portion terminates in a hub construction 24 for receiving the forward end of a horizontal supporting or drum shaft 25 concentric to the drum axis for rotating the drum 11. Elevating or agitating vanes 27 forming part of the cylindrical wall 18 are spaced within the drum to provide the means for agitating the clothing in a tumbling manner when the drum is rotated.

The drum shaft 25 extends axially rearwardly from the hub 24 through the container 12 and its outer end has a driven pulley 28 of any suitable type secured thereto. This pulley may be driven at a reduced speed by means of a speed reduction pulley and belt arrangement 29 connected to any suitable drive means, such as, for example, a motor 31 resiliently mounted on the base frame construction 14. In addition, the drum shaft is preferably journaled in a pair of spaced bearings 32 mounted in a horizontally projecting tubular housing construction 33 which in turn is rigidly secured to the rear channel structure 16 through a bracket 34 to hold the drum steady during all phases of operation. It is to be understood any suitable supporting and driving means may be provided for the rotatable drum 11.

The container or casing 12 surrounding the drum 11 includes a substantially imperforate longitudinally extending wall 35 whose lower sector 37 is generally cylindrical in transverse section and axially recessed at its lowermost portion for substantially its entire length to provide a water collecting trap or sump 38, a rear wall 39, having a small opening 40 therein through which the drum shaft 25 extends, and a front wall 41 having an access opening 42 in line with the access

opening 20 in the drum. All of these elements are secured together at their marginal edges 43 in any suitable manner, to provide a unitary rigid structure. Both front and rear walls are preferably imperforate except for the centrally located openings. In addition, the outer surface of the container 12 is preferably provided with suitable heat insulating material 47 to improve the overall efficiency of the drier.

The cabinet 17 which completely encloses the container 12, base frame construction 14, drive mechanism 31 and other auxiliary equipment, has an access opening 46 in its front wall 47 in alignment with the access openings 42 and 20, respectively, in the casing and drum, and the cabinet opening 46 is provided with a hinged insulated door or closure 48 which is moved from its open to its closed position by the operator. Covering or encompassing the aligned access openings is a resilient combination gasket and seal 49 which includes a forwardly projecting portion 50 for engaging the inner surface of the door 48 to seal about the opening, a central portion 51 carried between the adjacent portions of the cabinet and casing to provide a static seal and a rearwardly projecting annular portion 52 overlapping the access opening 20 in the drum 11 to provide a deflector to prevent articles of clothing from being snared between the rotating drum and stationary casing.

In order to evaporate the moisture in the clothing, heat from a suitable gas or electric source must be supplied to the drying chamber 13. In the modification shown, there is disclosed, by way of example, a pair of standard sheathed electric heating elements 53 which are mounted within the drying chamber 13 in oppositely disposed recessed portions 54 at the upper section of the casing beyond the outer periphery 18 of the drum.

Since the stationary container 12 is not provided with an inlet nor an outlet, as such, means must be provided to dispose of the vapor evaporated from the moist clothing being dried, also the lint shaken from the clothing. In the preferred form, the vapor is condensed by having it directly contact a zone or area 56 on one side of the lower cylindrical wall portion 37 of the container 12 which is directly cooled by a stream or thin film of cool water flowing over its inner surface or periphery. The cooling or condensing water may be supplied from any suitable source of supply under the control of a solenoid operated water control valve 58 and is discharged from the downwardly directed end of a conduit 59 into a distribution box or receptacle 60 whose inner wall 61 is formed by part of the wall 36 of the casing and defines the upper end of the condensing section or zone 56. The portion of the casing 12 defining the inner wall 61 of the water distributing receptacle 60 is provided with a plurality of parallel and horizontally spaced small orifices or openings 62 through which the water flows by gravity during the drying operation.

Covering these openings within the casing is a curtain type flap or check valve 63, made of relatively thin plastic material having non-sticking or adhesion resistant characteristics, anchored to the casing at its upper end 64 and free at its lower end 65. In this manner the condensing water flows through the distributing orifices 62 and downwardly between the bottom 66 of the check valve 63 and the inner peripheral surface of the casing forming the condensing zone 56 in a relatively thin film. If for any reason there

be a tendency for the vapor pressure within the

drying chamber to increase above atmospheric pressure, the internal pressure acting on the curtain type check valve 63 moves it against the wall of the casing and prevents the escape of the vapor outwardly through the openings 62 into the interior of the cabinet 17.

The lower end of the cooling or condensing zone is recessed as previously mentioned to provide the trap or sump 33 for collecting the condensing water, condensed vapor and lint, and this sump has a centrally located drain outlet 66 which also provides the inlet to a centrifugal pump 67 mounted directly therebelow at the lowermost portion of the casing. The centrifugal pump may be rotated by the drive motor 31 through suitable belt mechanism 68 and the discharge end of the pump is connected to a conduit 69 leading to a suitable drain.

From the above description, a cold wall clothes drier construction has been disclosed which will condense all of the vapor evaporated from the clothing during the drying operation and dispose of a major portion of the lint due to the natural tendency of the vapor-borne lint to travel with the vapor in the direction of the coldest portion in the casing. However, due to the fact the condensing water is flowing over a more or less restricted section or zone on the inner surface of the casing, a portion or area of the metallic casing adjacent the condensing zone 56 and over which no water is flowing will be cooled, due to the thermal conduction of the metal, below the dew point of the vapor in the drying chamber 13. While the major portion of the vapor is attracted to the actual surface over which the water is flowing, a portion of the vapor will contact and condense on the surrounding portion of the casing below the dew point of the vapor. Since the accumulation of moisture in this surrounding area is not rapid enough to cause washing or self-cleaning of the same, the surface remains wet or damp and a portion of the lint contacts this area, settles thereat and tends to attach itself to the wall and remain fixed. This results in a gradual accumulation of lint and after a period of time may result in malfunction of the drier. This action is just the opposite to what happens when the lint contacts the condensing surface proper whereat it is saturated with water and flushed to the drain 66.

Accordingly, it is the prime object of this invention to confine the condensation of vapor to the liquid cooled condensing area 56 and to either eliminate or reduce to a very minor problem the tendency for lint to collect in the area or zone immediately surrounding the same. To accomplish this, a pair of arcuate strips of material 71 preferably of the thermal insulating type, such as, for example, laminated phenolic resin or the like are secured on the inner surface or periphery of a portion of the cylindrical wall of the casing in parallel relation at either side of the condensing area 56, in any suitable manner. These strips are relatively wide and extend inwardly from the front and back walls 39 and 41, respectively, and from adjacent the water distributing receptacle 60 to the sump 33 at the bottom of the condensing section 56. Since the strips have radial thickness and rest upon the inner periphery of the cylindrical portion of the casing, the oppositely disposed inner edges 73 of the strips provide a channel or boundary for the cooling water flowing over the cylindrical wall and define its axial width. The inner exposed surface 74 of the insulating strips 71 are

disposed radially inwardly with respect to the condensing surface and the remainder of the cylindrical wall portion of the casing 12 and are preferably relatively smooth and dark or black in color to increase their heat absorption and further increase the temperature difference between the exposed surface and the condensing zone 56. Under some conditions a thin strip of sealing material 76 having an outer smooth surface is disposed along the edges of the insulating strips to provide a seal.

From the above it can be seen that, although the cylindrical portion 37 of the casing 12 adjacent the condensing zone 56 is cooled below the dew point of the vapor, the thermal insulating strips 71 prevent vapor contact therewith and because the strips are relatively poor heat conductors the exposed surfaces 74 will tend to remain more nearly at the operating temperature of the rest of the chamber. Also, that a relatively sharp line of demarcation in temperature is provided at the sides of the condensing zone. An arrangement of this type has been found generally satisfactory under a major portion of drying conditions to adequately handle the lint problem, however, under exceptionally severe linting conditions or cold condensing water, lint will tend to fall and collect on the thermal strips.

In order to obviate this condition, in the embodiment shown, a pair of oppositely disposed radially outwardly extending thin flexible wiping strips or members 77 whose anchored ends are securely fastened adjacent the outer periphery of the rotatable drum 11 by any suitable clamping means, such as, for example, screws 78 acting through a bar 79 held against the outer edge of one of the elevating vanes 27. These thin strips are preferably formed from a plastic material having non-sticking or adhesion resistant characteristics such as, for example, a fabric impregnated or coated with polytetrafluoroethylene or the like, one form of which is sold under the trade name of "Teflon." The radial lengths of the wiping members 77 are such that the outer free edges or ends 80 contact and brush across the entire exposed area or surface 74 of the thermal insulating strips 71 and their lengths are preferably slightly greater than the widths of the thermal insulating strips.

Thus, as the drum 11 is rotated the free ends 80 of the wiping members 77 are moved into contact with the thermal insulating strips 71 at the upper edge and are moved downwardly over the entire exposed area and any lint which may have fallen or settled on the strips during the previous portion of the revolution will be pushed ahead of the members circumferentially along the surface until it reaches the bottom edge of the strips 71, whereat the lint falls into the sump 33 and is conducted by the water therein to the inlet 66 of the centrifugal pump 67. Since the wiping members 77 comprise a material which has non-sticking or adhesion resistant characteristics, the lint does not tend to adhere to and accumulate thereon and also since the exposed surface 74 of the thermal insulating strips 71 are relatively highly polished, there is very little or no resistance to the scraper in moving the lint along its surface.

In the operation of a clothes drier of the type disclosed, the operator opens the door 48 and inserts the damp clothing to be dried into the rotatable drum through the aligned access openings, 46, 42 and 20, respectively, after which the door is closed and latched against the door gasket.

7
50 to seal the interior of the container at this point.

Next the operator adjusts or manipulates suitable control mechanism (not shown) to initiate the drying operation. This control mechanism acts to cause energization of the heating elements 53 to supply heat to the drying chamber 13 to evaporate the moisture in the clothing, start the drive motor 31 to rotate the drum 11 about its horizontal axis at approximately 45 R. P. M. to tumble and agitate the clothes and rotate the centrifugal liquid discharge pump 67, and at the same time open the water control valve 58 to permit the flow of water through the conduit 59 to deliver the same into the water distribution receptacle 60 at the upper portion of the condensing area 56. The water in the receptacle 60 flows through the orifices 62 to provide a relatively wide and thin stream or sheet of water which passes from beneath the lower edge 65 of the check valve 63 and flows uniformly downwardly over the condensing area 56 longitudinally defined by the inner edges 73 of the arcuate thermal insulating strips 71. As the cooling or condensing water reaches the bottom of the casing, it is collected in the sump 38 and is conducted by gravity to its outlet opening 66 providing the inlet to the centrifugal pump 67 and is discharged therefrom to drain through the drain conduit 69.

As the heat builds up in the container 13, the moisture in the clothing being dried is evaporated therefrom. With the drum 11 being rotated in a counterclockwise direction, as viewed in Figure 1, the vapor is circulated around the inner periphery of the stationary container 13 and in so doing a portion of the vapor directly contacts the cold water flowing over the condensing area or zone 56 and is condensed. This condensation of the vapor develops a slightly reduced pressure about the zone and results in a flow of vapor in the direction of the cold surface whereat it is condensed. As the condensing water and condensate reach the bottom of the chamber it flows into the sump 38 and is discharged as previously mentioned.

As the vapor moves toward the condensing section 55 of the drying chamber to be condensed, the fine air or vapor-borne lint will be carried by the vapor and it will likewise contact the cooling water and absorb enough moisture to settle thereon. Since a continuous supply or film of water is flowing over the condensing area, the lint will be washed or moved downwardly by the flowing water into the sump 38 and be discharged to drain along with the water and condensate. Likewise the heavier lint falling out of the drum on the condensing side of the chamber is washed to the trap along with the other lint, and the heavier lint falling from the opposite side of the drum will tend to roll downwardly into the sump 38 for discharge also.

With the parallel arcuate thermal insulating strips 71 disposed at the opposite end walls of the casing and defining the condensing zone 57 therebetween, the tendency for the surrounding area about the condensing zone proper to be cooled below the dew point of the vapor is reduced considerably; therefore, a relatively sharp line of demarcation in temperature has been provided. In addition, the thermal insulating strips 71 are preferably dark in color to absorb a certain amount of radiant heat within the drying chamber to further increase the temperature difference between the zones, thus, the condensa-

tion of moisture is inhibited and moisture does not have a tendency to collect on the exposed upper flat surfaces 74. Since a flat surface of this type will collect lint to a degree under adverse operating conditions, the flexible wiping members 77 formed from adhesion resistant material are moved across the polished or smooth surfaces 74 by the rotating drum 11 to remove the lint by pushing it downwardly and dropping it into the sump 38 at the bottom of the container.

At the end of the drying operation when the moisture in the clothing has been reduced to the desired value, or at the end of a timed interval, suitable control means are actuated to deenergize the heating element 53 and motor 31 and close the water control valve 58 supplying the condensing water. The operator need but open the door 48 and remove the dried clothing from the drum 11 and the drier is then ready for drying the next batch of moist clothing.

Referring now to Figure 5, there is shown a slightly modified lint wiper arrangement wherein the wiping members 81 are mounted on an angle with respect to the axis of the drum 11 on suitable supporting bars 82 which may be carried between the open outer ends of one of the elevating vanes 27. The radial depths and the lengths of the wiping members are such that the free ends contact and cover the entire width of the thermal strips 71, and they are mounted on an angle with respect to the same so that as they pass over the exposed surfaces 74 of the strips they tend to move the lint inwardly toward the condensing area proper so that the flowing water in the channel will move the lint to drain.

With a drier construction of the type disclosed it is obvious the operator is not required to remember to check and clean the lint trap, relatively large quantities of moist heated air are not discharged into the ambient atmosphere and efficient drying is accomplished regardless of the humidity conditions of the ambient atmosphere.

From the foregoing it can be seen that a relatively simple drier construction has been provided which has no lint trap, does not require the circulation of ambient air therethrough and wherein both the heating and cooling or condensing operations are confined to definite areas within a single chamber which also houses the rotatable drum for agitating the clothing. Also, that a relatively simple and effective means has been provided to define a relatively sharp condensing zone by using strips of thermal insulating material on either side of the zone and that means in the form of wiping members having non-sticking or adhesion resistant characteristics are mounted on the drum to keep the exposed polished surface of the insulating strips free from any lint which may settle thereon.

While I have herein described and upon the drawings shown illustrative embodiments of the invention, it is to be understood that the invention is not limited thereto but may comprehend other constructions, arrangements of parts, details and features without departing from the spirit of the invention.

It is claimed:

1. In a tumbler type clothes drier, the combination of a rotatable drum for tumbling clothing to be dried, a substantially imperforate container surrounding said drum and defining a drying chamber therein, means for heating said chamber to evaporate the moisture in said clothing, means including a pair of strips secured to the interior

of said container for defining a condensing section therebetween, means for cooling said condensing section to condense the vapor generated by said heating means within said casing, means carried by said drum for wiping said strips to remove lint therefrom, and means for conducting the condensate and lint to drain.

2. In a tumbler type clothes drier, the combination of a horizontally rotatable drum for tumbling clothing to be dried about a horizontal axis, a substantially imperforate container having cooperating walls openly facing said drum and defining a drying chamber therein, means for heating said chamber to evaporate the moisture in said clothing, means for cooling a portion of said walls to provide a condensing portion to condense the vapor generated by said heating means within said casing, said means including a liquid inlet for directing a stream of condensing water to flow downwardly over the condensing portion of said wall, a pair of spaced strips secured to one of the walls of said container to limit said condensing portion to a definite area, and means for removing the condensing water and condensate to drain.

3. In a tumbler type clothes drier, the combination of a rotatable drum for tumbling clothing to be dried, a substantially imperforate container having cooperating walls openly facing said drum and defining a drying chamber therein, means for heating said chamber to evaporate the moisture in said clothing, means including a liquid inlet in said container for conducting a film of cooling water over the interior of a portion of the lower sector of one of said walls to provide a vapor condensing area for the generated vapor, a pair of spaced strips secured to the said lower sector of said one of said walls to define a channel opening toward said drum for said cooling water, said strips providing an area of higher temperature than said condensing area to restrict the condensation of vapor to the condensing area, and means for discharging said cooling water and condensate to drain.

4. In a tumbler type clothes drier, the combination of a rotatable drum for tumbling clothing to be dried, a substantially imperforate container surrounding said drum and defining a drying chamber therein, means for heating said chamber to evaporate the moisture in said clothing, means for conducting a film of cooling water over the inner wall of a portion of the lower sector of said container to provide a vapor condensing zone for the generated vapor, a pair of spaced strips secured to the inner wall of said container to define a channel for said cooling water, said strips providing an area of higher temperature than said condensing zone to restrict the condensation of vapor to the condensing zone, means including a discharge opening for discharging the cooling water and condensate to drain, and means carried by said drum for contacting said strips to remove the lint therefrom and deposit the same adjacent the discharge opening in said casing.

5. A drier for damp clothing, comprising a horizontally rotatable drum for tumbling the clothing to be dried, a substantially imperforate container having cooperating walls for encompassing said drum and defining a drying chamber therein, means for heating said chamber to evaporate the moisture in the clothing, means for supplying cooling liquid to the interior of said casing to flow over a section thereof in a thin film to condense the vapor generated therein and to collect the lint thereat, spaced thermal insulating

members secured within said casing to define a channel for the liquid and a condensing area therebetween, said members confining said cooling liquid in said condensing area to a definite area, wiping means carried by said drum for contacting the said thermal insulating members to clean the same of lint and deposit the lint at the bottom of the casing, and means for discharging the cooling liquid, condensate and lint to drain.

6. A drier for damp clothing, comprising a substantially imperforate casing defining a drying chamber and provided with an access opening therein and a lower section, a closure for said access opening, a tumbler in said chamber for agitating the clothing, means for heating said chamber to evaporate the moisture in the clothing, means for supplying condensing water to the interior of said casing to flow over a portion of the lower section in a thin film to condense the vapor generated therein to collect the lint thereat, spaced thermal insulating members secured within said casing at said lower section to define a channel for the condensing water which constitutes a condensing area therebetween, said members confining the influence of said condensing water to the condensing area, wiping means carried by said drum for contacting said thermal insulating strips to clean the same of lint and to deposit the lint at the bottom of the casing, and means for discharging the cooling water, condensate and lint to drain.

7. A drier for damp clothing, comprising a drum mounted to agitate the clothing, a substantially imperforate casing having a longitudinal wall with a generally cylindrical lower portion and cooperating end walls openly facing said drum to define a drying chamber therein, one of said end walls having an access opening, a closure for said access opening, means for heating said chamber to evaporate the moisture in said clothing, means including a liquid inlet for supplying condensing water to the interior of said chamber to flow the same over a portion of said lower cylindrical portion in a thin film to condense the evaporated moisture by direct contact with the water, a pair of longitudinally spaced inwardly projecting arcuate shaped thermal insulating strips secured to said cylindrical portion adjacent said end walls to define an open channel facing said drum over which the cooling water flows and to limit the condensing action thereto, and means for conducting the cooling water and condensate flowing to the bottom of said casing to drain.

8. A drier for damp clothing, comprising a drum mounted to rotate about a horizontal axis to agitate the clothing, a casing having a longitudinal wall with a generally cylindrical lower section and end walls surrounding said tumbler and defining a substantially imperforate drying chamber, one of said end walls having an access opening therein, a closure for said access opening, means for heating said chamber to evaporate the moisture in said clothing, means for supplying condensing water to the interior of said chamber and flowing the same over a portion of the lower cylindrical wall section in a thin film to condense the evaporated moisture by direct contact with the water, a pair of arcuate shaped thermal insulating strips secured to said cylindrical surface adjacent said wall section to define a channel for the condensing water and to limit the condensing action thereto, means for conducting the condensing water and condensate

11

flowing to the bottom of said casing to drain, and wiping members carried adjacent the outer periphery of said rotating drum for contacting said thermal insulating strips to remove the lint therefrom and deposit the same adjacent the bottom of the casing to be discharged with the condensing water and condensate.

9. A drier for damp clothing, comprising a drum mounted to rotate about a generally horizontal axis to agitate the clothing, a substantially imperforate casing having a longitudinal wall whose lower sector is cylindrical in transverse cross-section and end walls for surrounding said drum to define a drying chamber, one of said end walls having an access opening therein, a closure for said access opening, means for heating said chamber to evaporate the moisture in said clothing, means for supplying condensing water to said casing, means for admitting the condensing water into the interior of said casing at a level approximating the axis of said drum so that it flows to the bottom thereof over a portion of the cylindrical sector of said longitudinal wall in a relatively thin film to provide a condensing area for the evaporated vapor, a sump formed in the bottom of the casing for collecting the condensing water, a pair of spaced parallel arcuate strips of thermal insulating material secured on the inner surface of said cylindrical sector extending from the opposite end walls and whose opposed inner edges define a channel for the condensing water and the limits of said condensing area, said thermal insulating strips having a smooth inner exposed surface of dark material for absorbing radiant heat from the drying chamber to provide a relatively sharp temperature gradient between the surface of said strips and the temperature of said condensing area to restrict condensation of vapor to the condensing area, radially outwardly projecting thin and flexible wiping members formed from adhesion re-

sistant material carried by said drum and rotatable therewith, said members contacting the smooth exposed area of said thermal insulating strips to remove lint deposited thereon and to deposit the same in said sump, and means including a pump carried on the bottom of the casing for discharging the condensing water, condensate and collected lint to drain.

10. A drier for damp clothing, comprising a horizontally rotatable drum for tumbling the clothing to be dried, a substantially imperforate container having a longitudinally extending wall with a cylindrical lower portion and cooperating end walls for encompassing said drum and defining a drying chamber therein, means for heating said chamber to evaporate the moisture in the clothing, means for flowing a thin film of condensing water over a sector of the cylindrical portion of said longitudinally extending wall to provide a condensing zone for the vapor and to collect and dispose of the lint, a pair of arcuate and parallel strips carried by said cylindrical wall and disposed on opposite sides of said condensing zone to restrict the influence of said condensing water, flexible members having poor lint retaining characteristics carried adjacent the outer periphery of said drum for contacting said strips to remove lint therefrom and to deposit the same at the bottom of said container, and means for conducting the condensing water, condensate and lint to drain.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
586,766	Haslam	July 20, 1897
1,948,357	Newkirk	Feb. 20, 1934
1,996,253	Otis	Apr. 2, 1935
2,451,692	Pugh	Oct. 19, 1948
2,495,535	Morrison	Jan. 24, 1950
2,644,245	Hammell et al.	July 7, 1953