

Oct. 19, 1948.

M. L. PUGH
CLOTHES DRIER

2,451,692

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2 Sheets-Sheet 1

Fig. 4.

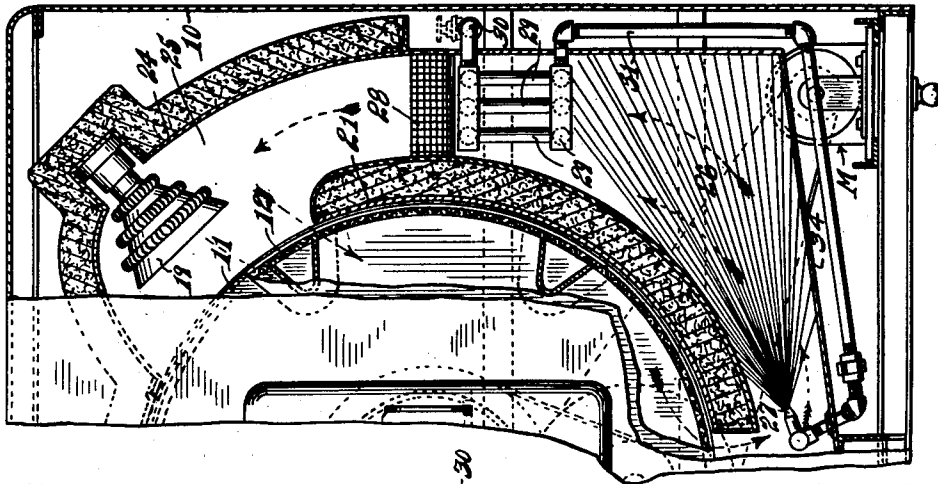
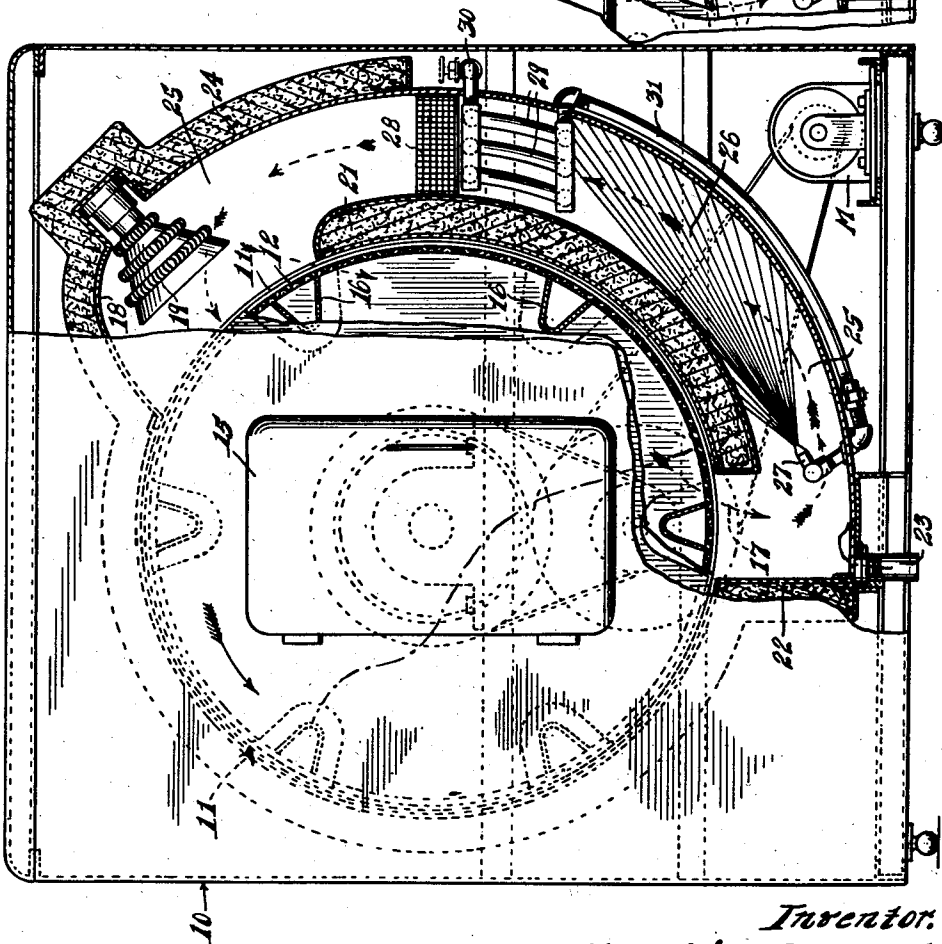


Fig. 1.



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Fig. 3.

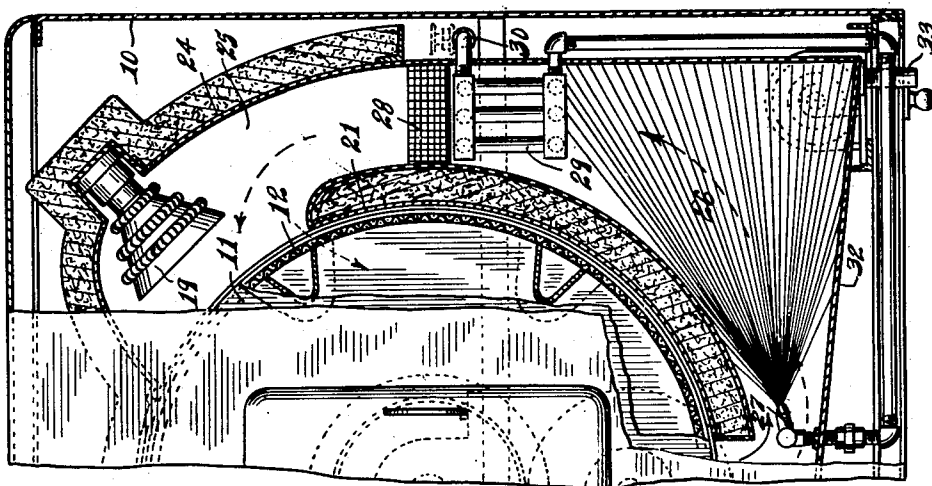
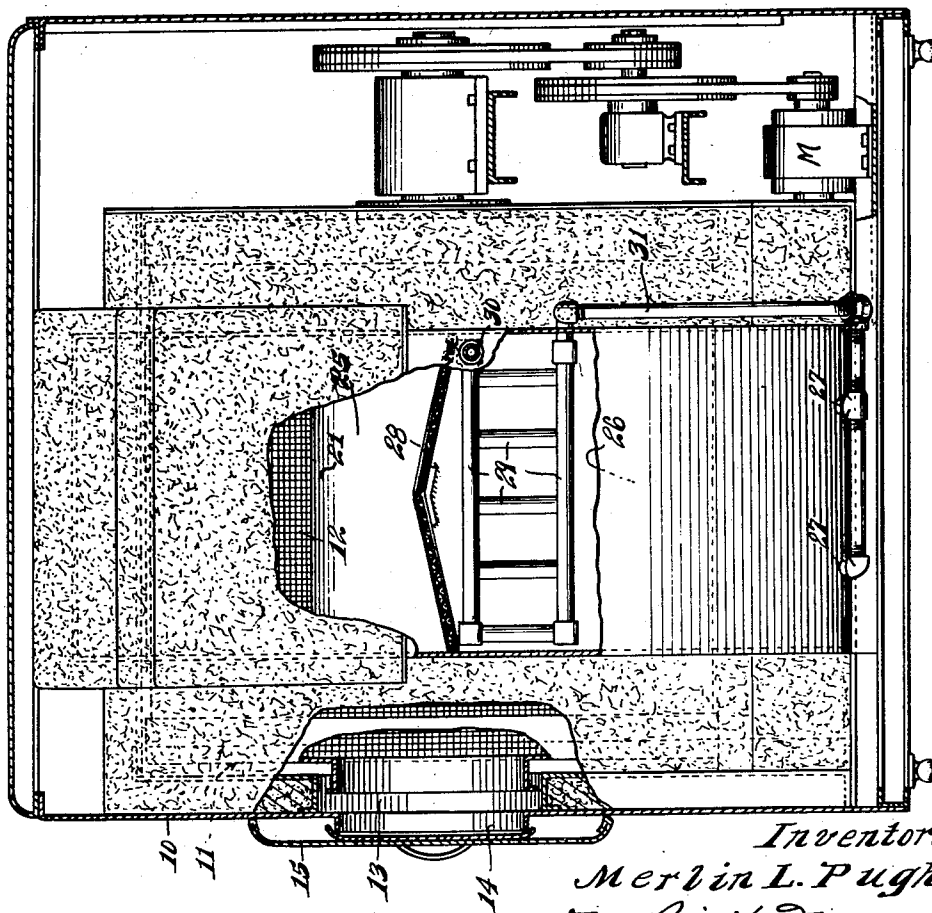


Fig. 2.



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UNITED STATES PATENT OFFICE

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CLOTHES DRIER

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8 Claims. (Cl. 34-74)

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This invention relates to clothes drying apparatus which uses radiant heat such as that furnished by near infrared ray lamps or open resistance type heaters as a means to evaporate moisture quickly from clothes being dried therein, and also wherein a cold water spray is the primary medium used to remove moisture and lint from the air circulating through the drier.

One object of invention is to provide a clothes drier which is inexpensive to manufacture and economical to operate, yet which dries clothes fast enough that successive batches from a domestic washing machine may be introduced and removed therefrom as fast as the machine will wash them with assurance that the clothes are thoroughly dried without wrinkles and that moisture and lint from the air in the drier is not discharged into the room to make it uncomfortably humid and unsightly.

Another object is to provide a clothes drier in which air is recirculated and its moisture content reduced, so that it effectively dries the clothing, primarily by means of a cold water spray for condensing moisture out of the recirculated air, which water is then led to a drain.

It is a further object of the invention to provide a clothes drier in which a cold water spray not only removes moisture and lint from the air in the drier, but also effects circulation of the air in the drier by its jet-like action.

It is still another object of the invention to provide a novel precipitator for removing any excess water from the recirculated air prior to the time it contacts the clothes and after it has passed through a water spray.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my clothes drier whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims and illustrated in the accompanying drawings, wherein:

Fig. 1 is a vertical view partially in section of a clothes drier embodying my invention;

Fig. 2 is a vertical sectional view of the clothes drier shown in Fig. 1;

Fig. 3 is a partial view partially in section of another embodiment of the invention; and

Fig. 4 is a partial view partially in section of still another embodiment of the invention.

Referring specifically to the drawing for a detailed description of the invention numeral 10 designates an outer housing or casing within which my clothes drier mechanism is located. The drying mechanism includes a drum 11 having

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a perforate cylindrical wall 12 and a collar like opening 13 at one end thereof. The opening 13 registers with a stationary collar 14 on the housing 10 which is normally closed by a door 15. The door may be opened for introducing clothes into the drum 11 through the opening 13.

The drum 11 has a series of axially extending ribs 16 for the purpose of tumbling the clothing within the drum as it rotates in the direction of the arrow in Fig. 1, being driven by motor M. The tumbling action positions the clothes approximately at the dotted line indicated at 17 opposite a reflector 18. Within the reflector 18 resistance heating elements 19 may be positioned. Obviously, infra-red lamps may be used in place of resistance heaters.

The foregoing construction is substantially the same as that shown in my copending application Serial Number 528,515, filed March 29, 1944, now Patent #2,434,886. In addition to the disclosure in that application, I provide the following described mechanism for recirculating the air within the housing 10 and removing moisture and lint therefrom.

Referring to the embodiment of my invention illustrated in Figs. 1 and 2, an insulated housing 21 is provided for the drum 11 and has an extension 22 thereon. A drain 23 is positioned below the extension 22. A second housing 24 which is curved and spaced from the housing 21 to provide a passage 25 extends between the extension 22 and the reflector 18. Air is circulated in the direction of the broken arrows in Fig. 1, that is, from the drum 11 through the extension 22, up passage 25 past the heat source 19 and back into the drum adjacent the heat source.

In order to effect movement of the air, I provide a water spray 26 from nozzles 27 which nozzle is positioned at the bottom of passage 25 and is directed upwardly therethrough. Air is thereby circulated through the path described by the jet-like action of the nozzles and water spray. Cold water is supplied from any suitable source through a valve and conduit 30 in a manner later described.

Furthermore, the hot moisture laden air emanating from the extension 22 has most of the moisture removed therefrom by passing through the cold water spray 26. In addition any lint in the air is removed by the water spray 26 and is conveyed to the drain 23. The air is, of course, heated again when it passes over heating element 19 and while in the drum 11, since the heating element throws most of its heat into the drum. I also provide a precipitator 28 in the passage

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25 in the form of a plurality of layers of coarse metal screen. Preferably, coils 29 are disposed below the precipitator 28. Cold water entering the coils 29 from the valved conduit 30 is conveyed to the nozzle 27 through a conduit 31. Any free moisture in the air from the water spray is removed by the coarse metal screen and the coils 29 insure that the air is completely dried.

In Fig. 3 the outer housing 24 forming passage 25 is more rectangular in shape and has a bottom wall 32 which slopes downwardly from extension 22 to one of the corners of the outer housing 10. In this case a drain 33 is positioned at the lower corner of the housing 24. The action of the nozzle, water spray and coils and precipitator is the same as described with respect to Figs. 1 and 2.

In Fig. 4, the outer housing 24 forming passage 25 is also rectangular in shape and has a bottom wall 34 which slopes slightly upwardly. In this embodiment, the drain 23 is not shown, but is in the same position as shown in Fig. 1. Again the action of the spray, the nozzle and the coils and precipitator are the same as described with respect to Fig. 1.

From the foregoing it will be apparent that I have provided an improved clothes drier wherein a water spray effects circulation of air and also dehydrates and cleans the air recirculated in the drier.

Certain changes may be made in practicing my invention without departing from the spirit and purpose thereof and it is accordingly my intention to cover by my claims any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

I claim as my invention:

1. In a clothes drier, a casing having a clothes receiving opening in the front thereof, a drum rotatable in said casing and having a clothes receiving opening registering with the clothes receiving opening of said casing, means for rotating said drum, said drum being perforate to permit the circulation of air therethrough, a source of heat for heating the circulating air, a duct for air extending from adjacent the bottom of said drum to a location adjacent the top of said drum, and being in communication therewith at both ends, said source of heat also being disposed adjacent to the top of said drum, a cold water supply, a jet nozzle near the bottom of said duct for directing a cold water spray upwardly in said duct to forcibly circulate air from the bottom of said drum to the top thereof through said duct and to remove moisture and lint from the air so circulated and means for removing the water from the spray from the bottom of the casing.

2. In a clothes drier, a casing having a clothes receiving opening in the front thereof, a drum rotatable in said casing and having a clothes receiving opening registering with the clothes receiving opening of said casing, means for rotating said drum, said drum being perforate to permit the circulation of air therethrough, a source of heat for heating the circulating air, a duct for air having an inlet and an outlet, and extending from one portion of said drum to another portion thereof, said duct being in communication therewith at both ends, said source of heat being disposed adjacent the outlet of said duct, a cold water supply, a jet nozzle near the inlet of said duct for directing a cold water spray toward the outlet of the duct to withdraw air from the drum, remove moisture and

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lint therefrom and force said dried air past said heating means into the drum, and said duct having side walls, the wall adjacent the drum being curved to substantially follow the contour of said drum, and the other wall being rectangular in shape and having a corner disposed adjacent said outer casing and means for draining water from said jet nozzle from said duct.

3. In a clothes drier, a casing having a clothes receiving opening in the front thereof, a drum rotatable in said casing and having a clothes receiving opening registering with the clothes receiving opening of said casing, means for rotating said drum, said drum being perforate to permit the circulation of air therethrough, a source of heat for heating the circulating air, a duct for air having an inlet and an outlet, and extending from one portion of said drum to another portion thereof, said duct being in communication therewith at both ends, said source of heat being disposed adjacent the outlet of said duct, a cold water supply, a jet nozzle near the inlet of said duct for directing a cold water spray toward the outlet of the duct to withdraw air from the drum, remove moisture therefrom and force said dried air past said heating means into the drum, said duct having walls, the wall adjacent the drum being curved to substantially follow the contour of said drum, and the other wall being rectangular in shape and comprising a bottom wall portion and a side wall portion, said bottom wall sloping downwardly from the bottom of the drum, and a drain at the corner of the outer wall.

4. In a clothes drier, a casing having a clothes receiving opening in the front thereof, a drum rotatable in said casing and having a clothes receiving opening registering with the clothes receiving opening of said casing, means for rotating said drum, said drum being perforate to permit the circulation of air therethrough, a source of heat for heating the circulating air, a duct for air having an inlet and an outlet, and extending from one portion of said drum to another portion thereof, said duct being in communication therewith at both ends, said source of heat being disposed adjacent the outlet of said duct, a cold water supply, a jet nozzle near the inlet of said duct for directing a cold water spray toward the outlet of the duct to withdraw air from the drum, remove moisture therefrom and force said dried air past said heating means into the drum, said duct having walls, the wall adjacent the drum being curved to substantially follow the contour of said drum, and the other wall being rectangular in shape and comprising a bottom wall portion and a side wall portion, said bottom wall portion sloping upwardly from the bottom of the drum, and a drain adjacent the lower end of said bottom wall portion.

5. In a clothes drier, a casing having a clothes receiving opening in the front thereof, a drum rotatable in said casing and having a clothes receiving opening registering with the clothes receiving opening of said casing, means for rotating said drum, said drum being perforate to permit the circulation of air therethrough, a source of heat for heating the circulating air, a duct for air extending from adjacent the bottom of said drum to a location adjacent the top of said drum, and being in communication therewith at both ends, said source of heat also being disposed adjacent to the top of said drum in said duct, a cold water supply, a jet nozzle near the bottom of said duct for directing a cold water

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spray upwardly in said duct to forcibly circulate air from the bottom of said drum to the top thereof through said duct and to remove moisture from the air so circulated, and means for draining the water from said jet nozzle from said duct.

6. In a clothes drier, a casing having a clothes receiving opening therein, a drum rotatable in said casing and having a clothes receiving opening registrable with the clothes receiving opening in said casing, an air conveying conduit partially surrounding said drum and providing upper and lower chambers communicating with said drum, said drum being perforated to afford circulation of air therethrough, a source of heat for heating said circulating air, water injection means disposed in said lower chamber and directed upwardly to effect forced circulation of air out of the lower portion of the drum, upwardly through said conduit and into the upper portion of the drum, said source of heat being disposed between the water injection means and said drum and means for draining water from said lower chamber.

7. In a clothes drier, a casing having a clothes receiving opening therein, a drum rotatable in said casing and having a clothes receiving opening registrable with the clothes receiving opening in said casing, an air conveying conduit partially surrounding said drum and providing upper and lower chambers communicating with said drum, said drum being perforated to afford cir-

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ulation of air therethrough, a source of heat for heating said circulating air and water injection means disposed in said lower chamber, directed upwardly to effect forced circulation of air out of the lower portion of the drum, upwardly through said conduit and into the upper portion of the drum, said water injection means also being effective to remove moisture and lint from the air emanating from said drum, said source of heat being disposed between the water injection means and said drum and means for draining water from said lower chamber.

8. The apparatus claimed in claim 6, wherein a moisture precipitator is disposed between the water injection means and the source of heat.

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