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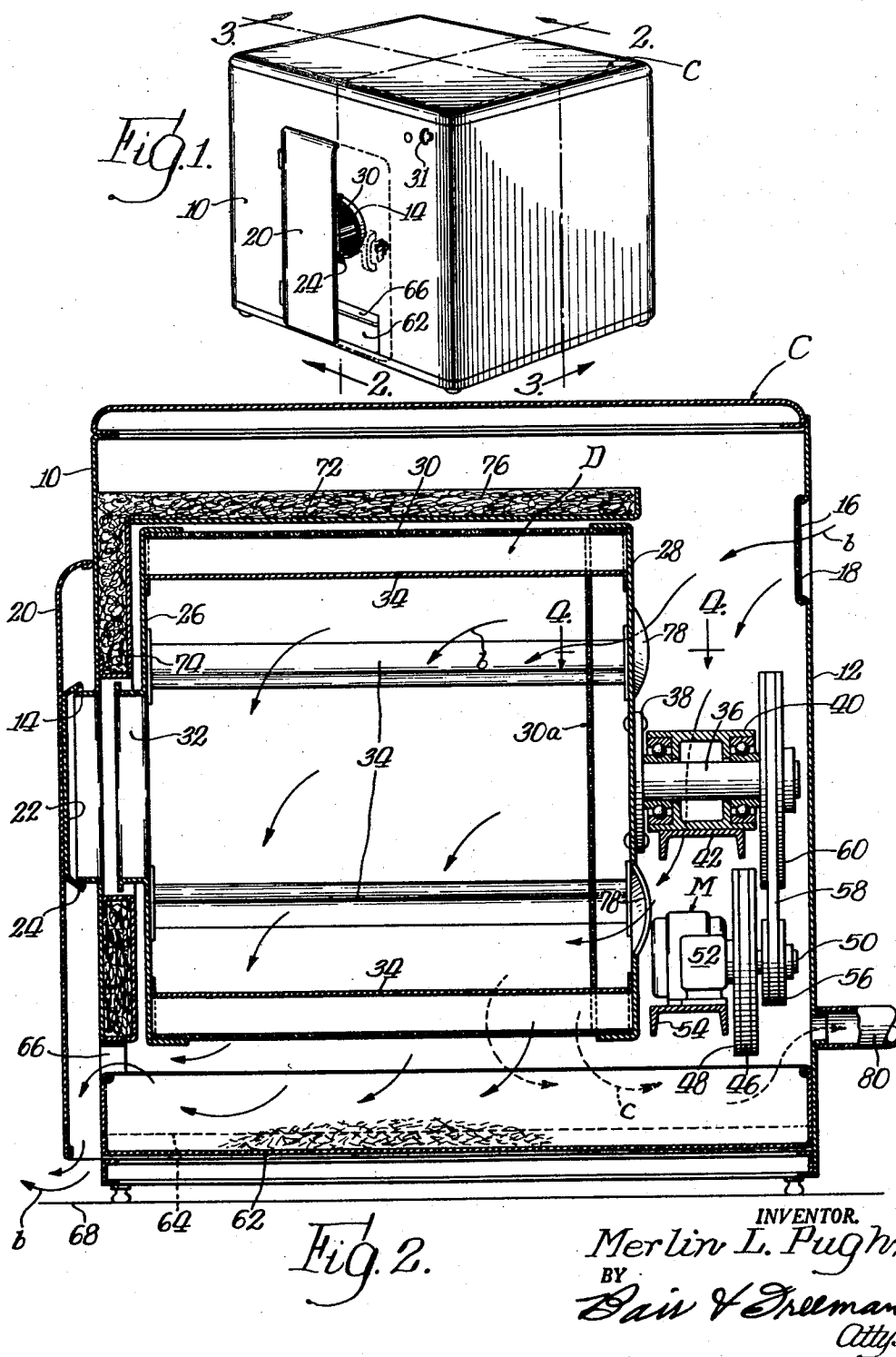
M. L. PUGH

2,434,886

ROTARY DRUM CLOTHES DRIER HAVING AIR CIRCULATING MEANS AND A LAMP HEATER

Filed March 29, 1944

2 Sheets-Sheet 1



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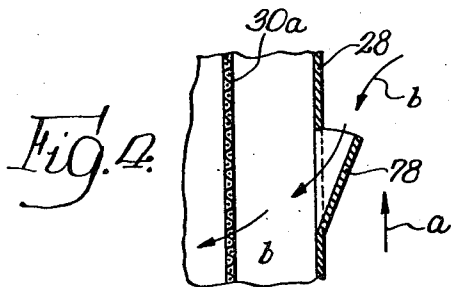
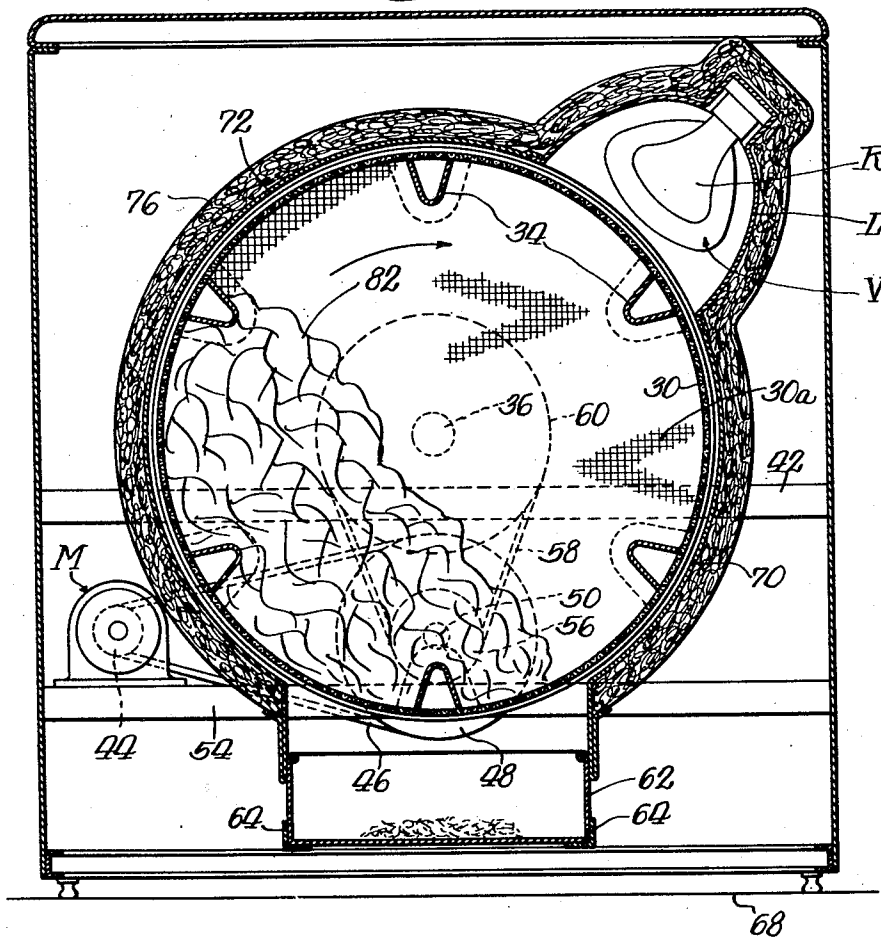
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Fig. 3.



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ROTARY DRUM CLOTHES DRIER HAVING
AIR CIRCULATING MEANS AND A LAMP
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2 Claims. (Cl. 34-60)

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My present invention relates to a clothes drier which uses radiant heat such as that furnished by near infra-red ray lamps as a means to evaporate moisture quickly from the clothes being dried therein.

One object of the 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 can be introduced and removed therefrom as fast as the machine will wash them with assurance that the clothes are thoroughly dried without wrinkles.

Another object is to provide a clothes drier of this general character in which ultra-violet lamps may also be used for germ exterminating purposes and to provide a tumbling action for the clothes so that they are thoroughly dried throughout, and loose lint is removed from the clothes by the tumbling action and may be removed from the clothes drier after accumulating in a lint reception drawer thereof.

Still another object is to provide a clothes drier which draws relatively small current compared to the usual electric clothes drier having a heating element in the form of an open resistance wire, the wattage requirement of my drier being considerably less because radiant heat or "infra-red" rays are used as the drying medium so that the drying action starts immediately upon impingement of the rays against the clothes. It is thus unnecessary to preheat the drier as when a resistance type heating element is used.

A further important object of the invention is to provide a drier in which heating efficiency is increased by using radiant heat as the drying medium which does not need air as a conducting medium, thus making it possible to pass a current of air through the drier to carry away the evaporated moisture without interfering with the drying operation in any way as the circulating air does not carry away heat required for evaporating the moisture and the efficiency is thereby greatly increased.

Still a further object is to provide a tumbler drum so constructed that the light rays may pass into it from lamps in a lamp housing outside of the drum, the drum being provided with means to circulate the air in the form of louvers that act to propel the air through the drum as a result of rotation of the drum.

An additional object is to provide a clothes drier in which the fire hazard is entirely eliminated by the use of a filament lamp having the filament enclosed in a glass envelope and thus not

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exposed to the lint and air within the drier so that there is no chance whatever of the lint or clothing catching fire.

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 perspective view of a clothes drier embodying my invention, a portion of the door being broken away to show the clothes reception opening and the lint drawer of the drier.

Fig. 2 is a vertical sectional view on the line 2-2 of Fig. 1.

Fig. 3 is a vertical sectional view on the line 3-3 thereof; and

Fig. 4 is an enlarged sectional view on the line 4-4 of Fig. 2.

On the accompanying drawings, I have used the reference character C to indicate a casing and D a drum. A lamp housing L is provided within the casing outside of the drum and may support one or more infra-red ray lamps R and/or one or more ultra-violet lamps V. The foregoing elements constitute the main parts of my invention and their construction and relation to each other will now be described.

The casing C includes a front wall 10 and a rear wall 12. The front wall 10 has a clothes reception opening defined by an annular flange 14. The rear wall 12 has an air inlet opening 16 covered by a mesh 18 of hardware cloth or the like. The clothes reception opening 14 is normally covered by a hinged door 20 which carries a cover plate 22 having an annular flange 24 to fit around the clothes reception opening and its flange 14 when the door is closed.

The drum D consists of a front wall 26, a rear wall 28 and a peripheral wall 30. The wall 26 has a clothes reception opening 32 registered with the clothes reception opening of the casing front wall 10. The peripheral wall 30 is perforated as by forming it of hardware cloth or the like. For bracing the walls 26 and 28 relative to each other, a series of sheet-metal ribs 34 extend between the walls and rigidly secure them together.

The drum D is mounted for rotation by means of a shaft 36 having a flange 38 secured to the wall 28. The shaft 36 is journaled in a bearing 40 which may be supported in any suitable manner such as on a channel member 42 extending from side to side of the casing C.

For driving the drum D at a relatively slow

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speed, for instance 75 R. P. M., I provide a motor M having a pulley 44 belted by a belt 46 to a pulley 48. The pulley 48 is mounted on a countershaft 50 which is journaled in a bearing 52 supported on a channel member 54. The motor M may also be supported on this channel member. A smaller pulley 56 is also mounted on the countershaft 50 and is operatively connected by a belt 58 with a large pulley 60 mounted on the shaft 36.

Below the drum D is a lint reception drawer 62 slidably mounted as on guide ways 64. An exit for air is provided above the top of the drawer 62 as indicated at 66 in Fig. 2 for a purpose which will hereinafter appear and the lower edge of the door 20 is spaced above the floor surface 68.

Surrounding the drum D with the exception of the lamp housing L and the drawer 62 is a cylinder comprising two parts 70 and 72 (see Fig. 3), formed of sheet metal or the like. In front of the drum is a stationary wall 74 and outside of the walls 70 and 72 as well as between the walls 70 and 74, insulation 76 is provided to conserve heat that is absorbed by the drum and which accordingly is useful in drying the clothes. The insulation 76 preferably extends around the lamp housing L also, as shown in Fig. 3.

Practical operation

In the operation of my clothes drier, the door 20 may be opened so that damp clothing from the washing machine wringer can be inserted through the openings 14 and 32 and into the interior of the drum. After the door 20 is closed, a switch 31 may be closed for electrically energizing the motor M and the lamps R and V. Infra-red rays will be radiated by the lamps R and violet light rays by the lamp V. These rays pass freely through the perforated periphery of the drum D and impinge the clothes in the drum to evaporate moisture therefrom, the heat energy being directly transferred from the lamps to the clothing without the necessity of using the intervening air as a conducting medium. Air may therefore be circulated through the drum without interfering with the drying action.

Air circulation can be conveniently and inexpensively accomplished by forming cupped blades 78 on the rear wall 28 of the drum by cutting several radial slits in the wall and bending the material outwardly adjacent one side of each slit. The bending operation is performed on the proper side of the slit with respect to the direction of rotation of the drum so that the blades 78 (as shown in Fig. 4) gather air when rotating in the direction of the arrow *a* and cause such air to pass into the drum as indicated by the arrows *b*. A perforate wall 30*a* is provided in the drum spaced from the rear wall 28 to prevent the clothes from clogging the openings formed therein by the blades 78.

Rotation of the drum partially evacuates the space in the casing C back of the drum so that additional air is taken in through the opening 16 and the screen 18. Accordingly the pressure within the drum is increased and air flows out of the drum wherever it can. Most of it drops into the lint reception drawer 62 and deposits its load of lint therein, the air itself passing on through the opening 66 and then out to atmosphere between the lower edge of the door 20 and the floor surface 68, additional arrows *b* being used to show the path of air movement.

Instead of the humid air from the clothes drier passing into the room, it may be discharged to

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outside atmosphere as through a conduit 80, the direction of flow then being in accordance with the dotted arrows *c*. This eliminates increasing the room humidity and the conduit 80 may be connected with a smoke stack or the like to utilize the draft therein as an additional air circulating means for the drier.

The location of the lamp housing L, it will be noted, is in the upper right hand corner of the casing C as viewed in Fig. 3 wherein the direction or rotation of the drum D is clockwise. Accordingly, the bulk of the clothes 82 during the tumbling action is directly opposite the lamp housing to utilize most effectively the radiant heat from the rays of the lamps R and V. The lamps are of the enclosed filament type and accordingly lint cannot come in contact with the filaments and thus cause a fire hazard.

The drying action by the lamps R starts immediately upon their energization as distinguished from heating elements which require a substantial amount of current for preheating the entire drier before they are effective. These lamps are commonly termed "infra-red" whereas they are actually only near infra-red but will be referred to as infra-red for the purpose of claiming the invention. The lamp V may or may not be used as desired depending upon whether it is desirable to effect germ extermination as well as other properties beneficial to the drying of clothing in addition to the actual drying itself. Any number of either type of lamp may be provided and I have found that about four of the near infra-red ray lamps R and one of the ultra violet lamps V are sufficient for a domestic size drier. The total wattage consumption is about 1000 so that special wiring does not have to be provided and yet a drier is produced that can handle the clothing and completely dry it as fast as it can be washed in a domestic washing machine.

The drawer 62 may be removed about once for an ordinary weekly wash and the lint removed therefrom so that the drier is ready for another wash day operation. In addition to the number of lamps being varied as desired, the size of the drier can also be increased for industrial installations as in laundries or the like. Changes of this suggested character may be made in the construction and arrangement of the parts of my clothes drier without departing from the real spirit and purpose of my invention and accordingly it is my intention to cover by my claims such modified forms of structure or use of mechanical equivalents as may be reasonably included within their scope without sacrificing any of the advantages thereof.

I claim as my invention:

1. A clothes drier comprising a casing adapted to rest on a floor surface and having a clothes reception opening at one end and an air reception opening at the other end, a door for said clothes reception opening, a drum within said casing and having a clothes reception opening at one end registered with the clothes reception opening of said casing, the periphery and the opposite end of said drum being perforated to permit entrance of air from said air reception opening of said casing to said drum through said opposite end of the drum and exit of air through said periphery of the drum into the bottom of said casing, a removable lint receiving receptacle in said casing, an air outlet therefrom between said casing and said door, said door being above the floor surface to permit exit of air between the door and the floor surface, means for cir-

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culating air through said casing along a path permitted by the foregoing described structure, means for rotatably supporting said drum at the end thereof opposite said clothes reception opening, means for rotating said drum, said drum having ribs therein adjacent the periphery to effect tumbling of the clothes in the drum during rotation of the drum, a lamp housing within said casing and outside the periphery of the drum at a point opposite the clothes when turning over in the drum, and infra-red ray lamps supported in said lamp housing whereby the rays from said lamps pass through the periphery of said drum and impinge the clothing in the drum for evaporating moisture therefrom.

2. A clothes drier comprising a casing having a clothes reception opening at one end and an air reception opening at the other end, a door for said clothes reception opening, said casing being adapted to rest on a floor surface, a drum within said casing and having a clothes reception opening at one end registered with the clothes reception opening of said casing, the periphery and the opposite end of said drum being perforated to permit entrance of air from said air reception opening of said casing to said drum through said opposite end thereof and exit of air from the periphery of said drum into the bottom of said casing, an air outlet from said casing, said door being above the floor surface to permit exit of air between the door and the floor surface, means for circulating air through said casing along a path permitted by the foregoing described structure, means for rotatably supporting said drum, means for rotating said drum, a lamp housing within said casing and outside the periphery of the drum at a point opposite the clothes when in tumbled position in the drum, and infra-red ray lamps supported in said lamp housing whereby the rays from said

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lamps pass through the periphery of said drum and impinge the clothing in the drum.

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