

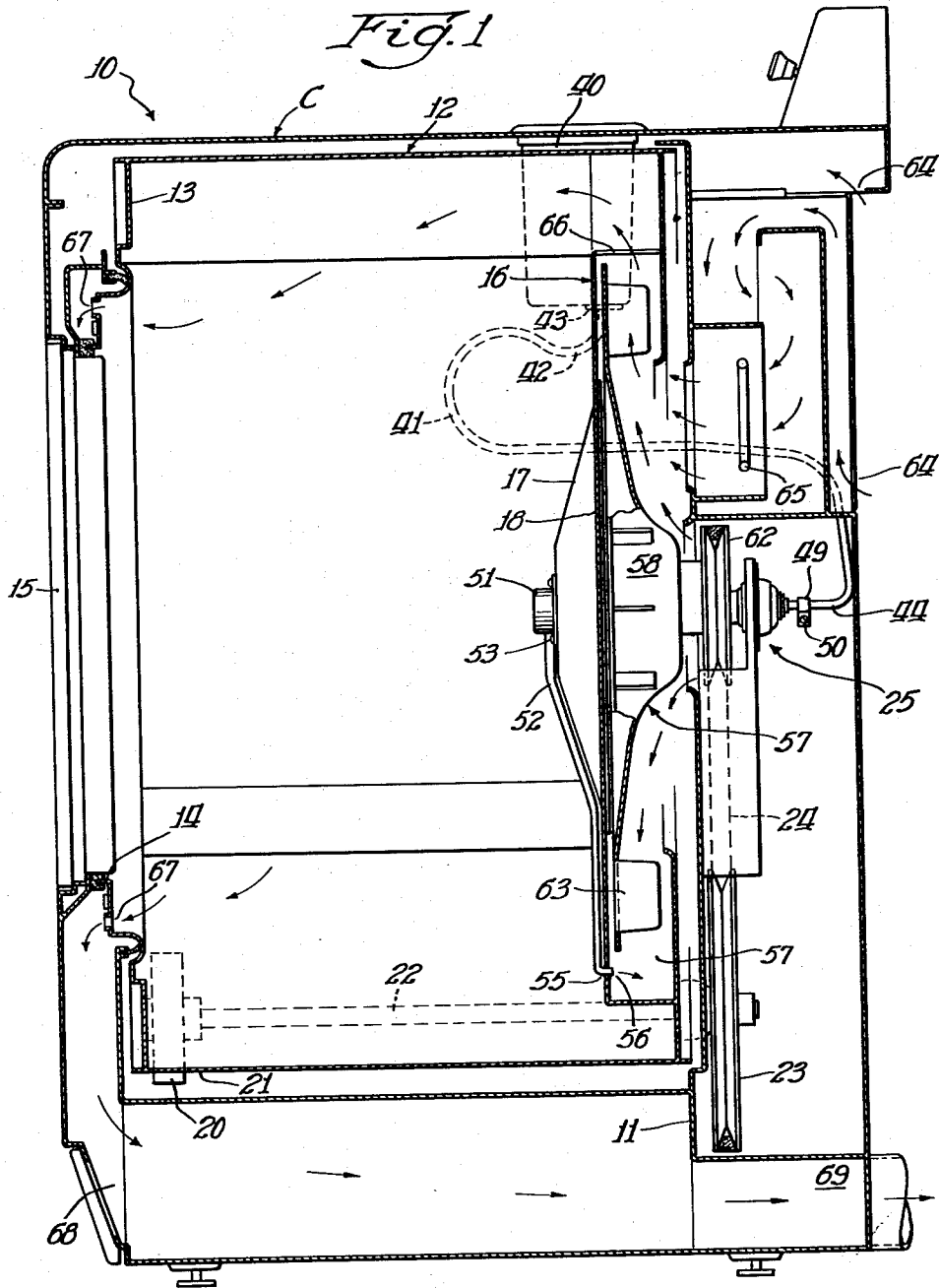
Dec. 17, 1963

A. W. KRUZAN
CLOTHES DRYING MACHINE

3,114,653

Filed March 21, 1961

2 Sheets-Sheet 1



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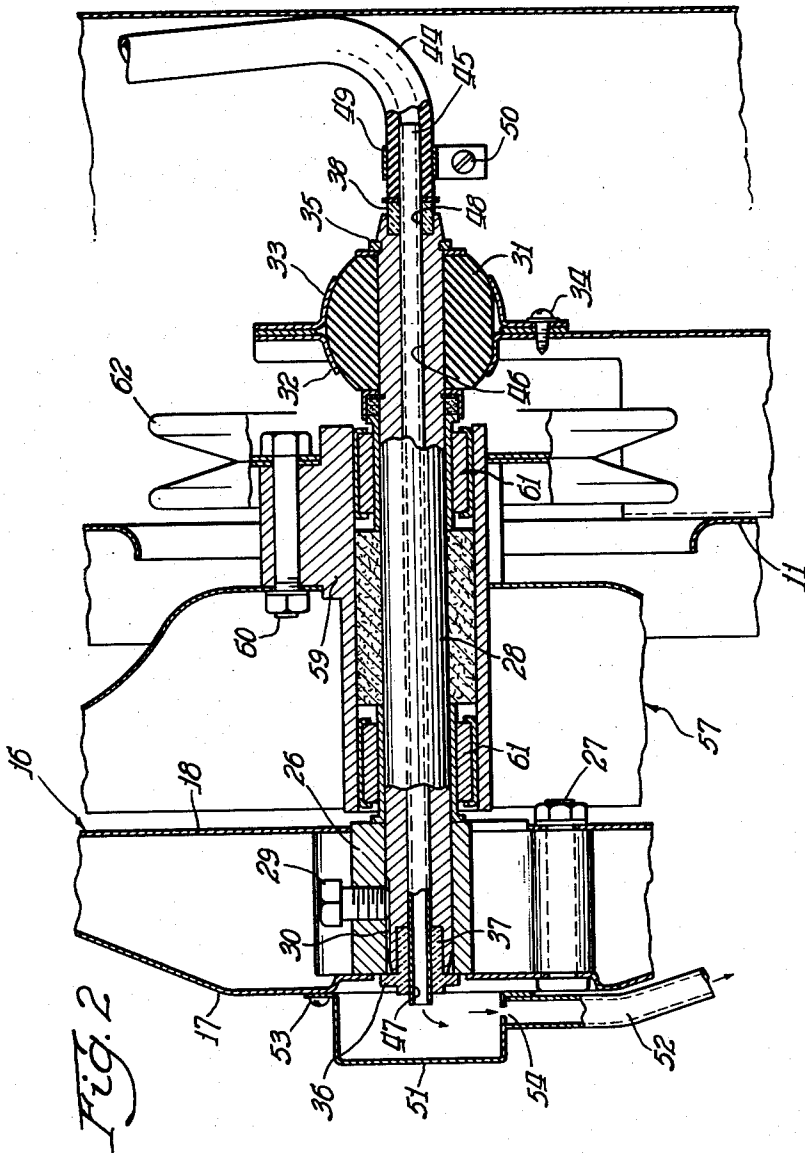
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CLOTHES DRYING MACHINE

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Filed Mar. 21, 1961, Ser. No. 97,278
5 Claims. (Cl. 118—48)

This invention relates to a clothes drying apparatus and more particularly to a clothes conditioning device which is operable to treat the clothes in the dryer while the dryer is in operation.

Where clothes are washed and subsequently dried in a clothes drying apparatus, the clothes may be dried without any conditioning such as mildew-proofing, mothproofing, or deodorization. There are various instances when it is desirable to condition certain clothes in one or more of these respects depending on the type of use contemplated and whether the clothes are to be stored, or used immediately. In either case it is therefore extremely important to provide a clothes drying apparatus whereby the clothes dried therein can be subjected to one or more conditioning processes in the drying stage so that the clothes will be appropriately conditioned upon the termination of the drying cycle.

An important object of this invention is to provide a clothes conditioning device for a clothes drying apparatus in which the device is of a simple and economical construction.

More particularly, it is an object of this invention to provide a clothes conditioning device for a laundry drying apparatus wherein a liquid conditioner is dispensed into the circulating heated air to permeate the clothes and thereby appropriately condition the clothes in accordance with the purpose of the particular liquid conditioner agent.

With these and other objects in view, the present invention contemplates a laundry drying apparatus having a rotating laundry basket or drum and a blower for providing a stream of air through the apparatus, including the clothes basket, to dry the laundry. A hollow support shaft is provided which extends through the back of the drum and is connected to a container so that appropriate conditioning liquid placed in the container will pass therefrom through the hollow support shaft into the drum. A conduit structure is provided in the drum which meters the fluid into the stream of the drying air at a point immediately beyond the blower. The liquid is thereby evaporated into the air stream or is otherwise suspended therein and as a consequence moves with the air to permeate and appropriately condition the clothes.

Other objects, advantages, and novel aspects of the invention will become apparent upon consideration of the following detailed description, in conjunction with the accompanying drawings, wherein:

FIG. 1 is a vertical sectional side view of a laundry drying machine embodying the new and improved clothes conditioning device and showing the path of the drying air and the conditioning liquid.

FIG. 2 is a partial vertical sectional view of the clothes basket support shaft of FIG. 1 and showing the path of the conditioning fluid through the support shaft.

Referring to FIG. 1, there is illustrated a clothes dryer with which the present clothes conditioning device may be associated. The presently described dryer structure, except for the improved clothes conditioning device, is fully described in the Reiter Patent No. 2,798,306. The dryer is generally designated by the numeral 10 and comprises a casing C, frame 11, and a cylindrical laundry basket or drum 12. The laundry basket 12 is provided with a front end 13 having an opening 14 adjacent an access door 15 in the frame 11. The basket 12 is also

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provided with a rear end portion 16 having an inner wall 17 and an outer wall 18.

The clothes basket 12 is rotatably supported near the front thereof by a pair of spaced rollers 20 which are in rolling engagement with an outer cylindrical surface 21 of the basket 12. The rollers 20 are respectively secured to parallel shafts 22 which in turn are rotatably supported in the frame 11. A pulley 23 is rigidly secured to one end of one of the shafts and a motor (not shown) is adapted to drive a belt 24 to rotate the pulley 23 so as to rotate the shaft 22 and the roller 20, which in turn rotates the basket 12.

The basket 12 is rotatably supported at the rear thereof by a bearing support structure generally designated by the numeral 25 (FIGS. 1 and 2). For this purpose, a hub 26 is rigidly secured to the inner and outer walls 17 and 18 of the rear end portion 16 of the basket 12 by a set of bolts 27. The hub 26 is secured to a shaft 28 by a screw 29 threaded through the hub 26 and into a key-way 30 in the shaft 28. The shaft 28 is rotatably supported by a bearing 31 which is held in the frame 11 by a retaining flange 32 of the frame 11 and by a retainer flange 33 secured to the frame by screws 34. The shaft is held against axial movement by a retainer ring 35 on the outer end of the shaft 28 adjacent the bearing 31, and by a flange 36 which is part of a fiber bearing 37 rigidly secured within the inner end of the shaft 28. It should be noted that a second fiber bearing 38 is rigidly secured within the outer end of the shaft 28.

A dispensing apparatus is provided for dispensing a clothes conditioning liquid, such as a moth-proofing, mildew-proofing, or deodorizing liquid, into the air stream of the dryer. For this purpose, a liquid container 40 is provided in the top of the dryer 10. A tube 41 is provided which has an upper end 42 connected to the liquid container at 43 and has a lower end 44 positioned adjacent the outer fiber bearing 38 of the shaft 28. A shaft tube 45 is positioned in a passage 46 in the support shaft 28 and extends through passages 47 and 48 in the bearings 37 and 38 respectively and into the tube end 44 adjacent the bearing 38. The end 44 of the tube 41 is secured to the shaft tube 45 by a clamp 49 which is fastened to the frame 11 by a screw 50. The clamp 49 serves to hold the tube 41 on the shaft tube 45 and against possible rotation so that the shaft tube 45 is held stationary.

A cap 51 and conduit 52 are secured to the inner rear wall of the clothes basket by bolts 53. A metering orifice 54 is provided between the cap 51 and the conduit 52 and the conduit 52 is formed at the bottom 55 (FIG. 1) so as to pass through an opening 56 in the rear wall 16 of the basket 12 into a chamber 57.

A blower, generally designated by the numeral 57, has a body 58 which is secured to a hub 59 by bolts 60. The hub 59 is rotatably mounted on bearings 61 on the shaft 28 and is provided with a pulley 62 secured thereto by the bolts 60 and adapted to be driven by the belt 24 which is driven by the motor (not shown). The blower body 58 is provided with a set of blades 63 which extend into the chamber 57 and cause air to be drawn into the drying apparatus at 64 when the blower body 58 is rotated on the shaft 28. The air thus entering the drying apparatus passes through a series of heating coils 65, is drawn into the blower 60, and is subsequently exhausted into the basket 12 through openings 66 where it engages the clothes contained in the basket and absorbs the moisture contained in the clothes to dry the clothes. The moisture-laden air in the basket 12 is then exhausted from the basket through openings 67 and enters an exhaust manifold 68 where it leaves the drying apparatus through a duct 69.

In operation, when the clothes are in the last stages

of being dried or when they are dry, a clothes conditioning liquid may be admitted to the tube 41 through the container 40. The liquid thus admitted to the tube 41 passes by force of gravity into the shaft tube 45 within the support shaft 28 and into the cap 51 within the clothes basket 12. The liquid thus admitted to the cap 51 will be urged through the metering orifice 54 into the conduit 52 by virtue of the centrifugal force created by the rotation of the clothes basket. The liquid thereupon flows from the conduit 52 into the chamber 57 adjacent the outer ends of the blades 63 of the blower 29. The stream thereupon picks up the liquid and passes into the clothes basket 12 to permeate the clothes with the liquid and appropriately condition the clothes.

This invention consists of the novel constructions, arrangements, and devices to be hereinafter claimed for carrying out the above stated objects and such other objects as will be apparent from the following claims:

I claim:

1. A clothes conditioning device for a laundry drying machine including a casing, a clothes-containing basket in said casing and rotatable about a substantially horizontal axis, a blower for circulating air in said casing and basket, a stationary liquid container, means for connecting said container to said basket including conduit means having first and second conduits, said first conduit being stationary and extending through said axis and connected to said container and to said second conduit to convey liquid to said second conduit, said second conduit being rotatable with said basket and having one end disposed in the path of the circulating air in said casing to dispense the liquid in said container into said circulating air before the air enters said basket.

2. In a laundry drying machine having a clothes basket for containing clothes to be conditioned, a blower for providing a stream of air through the drying machine and the clothes basket to engage the clothes, a hollow shaft rigidly secured to said basket and rotatably mounted in said drying machine for supporting said basket in said drying machine for rotation about a substantially horizontal axis, a source of conditioning liquid, stationary conduit connected to said source of liquid and connected to an outwardly extending end of said shaft, said shaft being adapted to pass said liquid therethrough into said basket, and conduit means connected to said shaft for rotation therewith and extending radially thereof for transmitting said liquid through said basket into said air stream to engage and appropriately condition the clothes.

3. In a laundry drying machine having a clothes basket mounted in said machine and containing clothes to be conditioned, a blower for providing a stream of air through the drying machine and said clothes basket to permeate the clothes, support means for mounting said clothes basket in said machine for rotation about a substantially horizontal axis, a container for containing an appropriate clothes conditioning liquid, stationary con-

duit means connected to said container and extending coaxially into said basket through said support means, and conduit means rotatable with said basket and extending radially within said basket and opening into said air stream and communicating with said stationary conduit means for transferring said liquid from said stationary conduit means into said air stream to move therewith into said basket to engage and appropriately condition the clothes.

4. In a laundry drying machine, a casing having a clothes containing basket rotatably mounted in said casing, and including support means for mounting said clothes basket in said casing for rotation of said basket about a substantially horizontal axis, a blower for circulating air through the casing and said clothes basket to dry the clothes, a container for containing a clothes-conditioning liquid, a first conduit means connected to said container and extending into said basket through said support means, and a second conduit means extending radially within and rotatable with said basket and having an opening disposed exteriorly of said basket, said second conduit means being adapted to transfer said liquid from said first conduit into said air stream in said casing.

5. A clothes conditioning device for a laundry drying machine comprising the combination of a clothes basket mounted in said machine for containing clothes to be conditioned, a blower for providing a stream of air through the drying machine and said clothes basket to permeate the clothes, a container for containing an appropriate clothes conditioning liquid, support means for rotatably mounting said clothes basket in said machine about a substantially horizontal axis, stationary conduit means connected to said container and extending coaxially into said basket through said support means, and conduit means extending radially within and rotatable with said basket and fixed to said basket and opening into said air stream adjacent the exterior of said basket in said drying machine and adapted to transfer the liquid from said stationary conduit means to the air stream by centrifugal force created by the rotation of said basket, said rotatable conduit means having an orifice therein for metering the flow of fluid through said rotatable conduit means in accordance with the predetermined capacity of the air stream to absorb the fluid.

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