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TUMBLER

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Fig. 1.

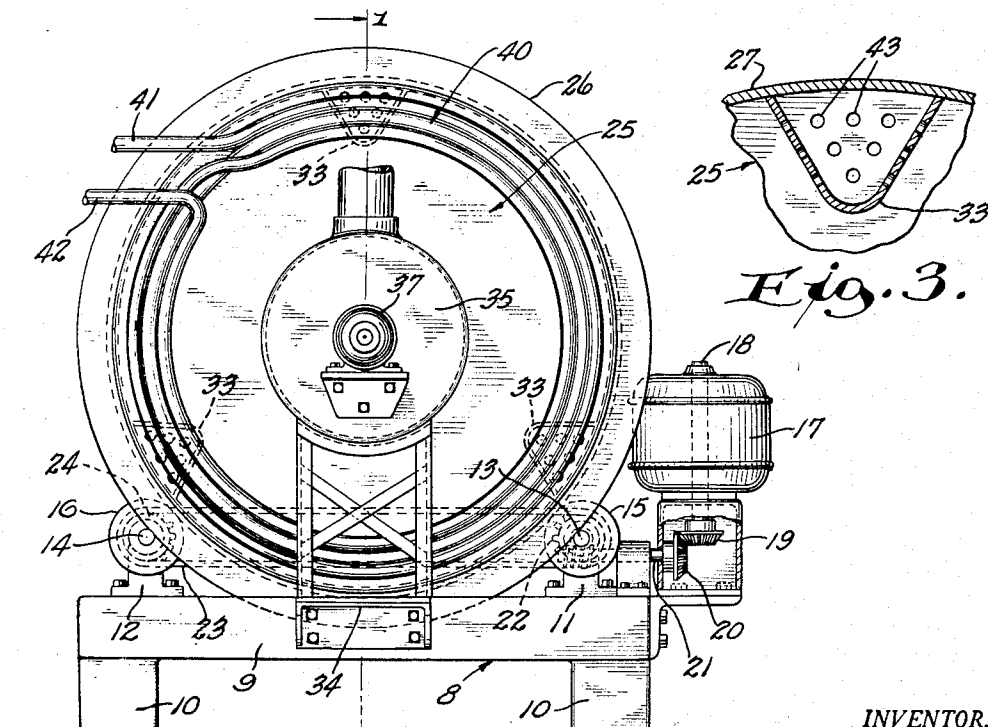
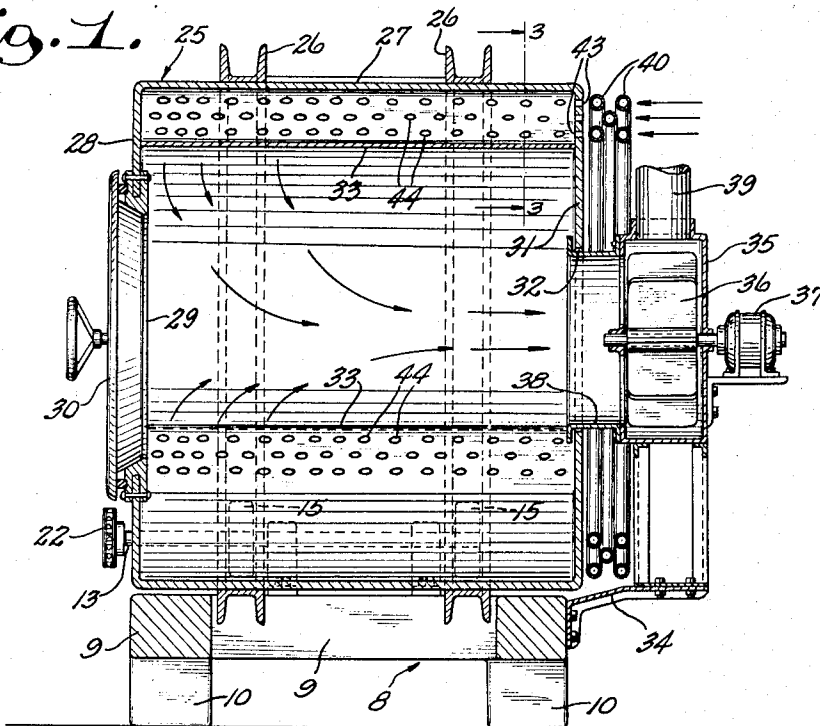


Fig. 2.

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TUMBLER

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8 Claims. (Cl. 34—134)

This invention relates to improvements in tumblers and more particularly to tumblers adapted for use in the laundry or dry cleaning industry.

In the usual type of tumbler there is a garment receiving cylinder having a foraminous periphery rotatable in an outer casing. In addition, the outer casing is provided with relatively complicated means for preheating air and for introducing said air into the rotatable cylinder. Suction hoods and conduits are also provided to remove the moisture laden air from the perforations in the periphery of the cylinder as the latter rotates. This type of construction utilizes a substantial amount of material and is expensive to manufacture and assemble. Furthermore, the heated air tends to travel to the periphery of the cylinder before it has extracted a maximum amount of moisture from the garments. As a result the drying operation is rendered relatively slow and inefficient.

It is a general object of the present invention to provide a tumbler in which no outer shell or casing for the rotatable cylinder is necessary, and wherein a novel and simple arrangement is utilized for causing effective circulation of heated air through the cylinder while the latter rotates, the heated air being so directed as to cause it to efficiently act upon the garments within the cylinder to extract the maximum amount of moisture therefrom.

A further object of the invention is to provide a cylindrical tumbler having a solid, unperforated peripheral wall, having a garment receiving opening at one end of the cylinder, heating means at the opposite end, and an air exhausting means at the same end as the heating means, there being novel means for conducting heated air into the drum and for causing said air to circulate effectively in the drum while the latter rotates.

A further object of the invention is to provide a construction as above described wherein there is an exhaust conduit positioned axially of the drum at one end thereof, and wherein the heating means surrounds the exhaust conduit and is positioned adjacent perforations in the end wall of the tumbler.

A further, more specific object of the invention is to provide a tumbler as above described wherein the perforations through which heated air enters the drum communicate with the interior of hollow perforated lifting ribs.

Other objections of the invention are to provide a tumbler which is simple and inexpensive

to manufacture, easy to assemble, strong and durable, and which is well adapted for the purpose described.

With the above and other objects in view the invention consists of the improved tumbler and all its parts and combinations as set forth in the claims and all equivalents thereof.

In the accompanying drawing illustrating one complete embodiment of the preferred form of the invention, in which the same reference numerals designate the same parts in all of the views:

Fig. 1 is a vertical sectional view taken axially through the cylinder approximately on the line 1—1 of Fig. 2;

Fig. 2 is an end view of the improved tumbler; and

Fig. 3 is an enlarged fragmentary view taken approximately on line 3—3 of Fig. 1.

Referring more particularly to the drawing the numeral 8 designates a suitable supporting frame having base members 9 and supporting legs 10. Mounted on the base are upstanding bearing members 11 on one side and 12 on the other side. A shaft 13 is journaled in the bearing members 11 and a shaft 14 is journaled in the bearing members 12. The shaft 13 has rigidly mounted thereon drum supporting rollers 15, and similar rollers 16 are rigidly mounted on the shaft 14.

In the illustrated exemplification an electric motor 17 has its drive shaft 18 provided with a pinion gear 19 which engages a pinion gear 20 on a horizontal shaft 21. The horizontal shaft 21 is adapted to drive, through suitable means such as a worm and wormwheel connection, the shaft 13. The forward end of the shaft 13 may be equipped with a rigidly mounted sprocket wheel 22 which is connected by an endless chain 23 with a sprocket wheel 24 rigidly mounted on the forward end of the other shaft 14. Thus, operation of the motor 17 in a desired direction causes simultaneous rotation of the two sets of drum supporting rollers 15 and 16. It is apparent, however, that any suitable means may be utilized for driving and transmitting power to the rollers 15 and 16. Furthermore, the rollers may be used merely as a rotatable support and the drum may be driven through any type of transmission desired.

The tumbler cylinder or drum 25 is mounted for rotation on a horizontal axis. This cylinder is equipped with external peripheral tracks 26 and is supported for rotation on the rollers 15 and 16. In the embodiment illustrated, the

rollers engage within the tracks to cause rotation of the cylinder.

The peripheral wall 27 of the cylinder is unperforated and the front end wall 28 is provided with a garment receiving opening 29. The opening 29 is closed by a door 30 which may rotate with the cylinder.

At the opposite end of the cylinder is a wall 31 formed with a central opening 32. The cylinder is also provided on its inner periphery with a plurality of hollow garment lifting ribs 33 which may be V-shaped in cross-section as illustrated in Fig. 3.

Supported on a bracket 34 which extends laterally from the base at the rear end of the cylinder is the housing 35 for a suction fan 36. This fan may be driven by an electric motor 37. A tubular conduit 38 which communicates with the interior of the fan housing 35 projects into the opening 32 at the end of the rotatable cylinder. The cylinder is therefore rotatable around the conduit portion 38. Another conduit 39 extends from the fan housing 35 to a suitable point of discharge.

Surrounding the exhaust conduit 38 is a suitable heating means 40. This heating means is preferably circular in form and positioned near the periphery of the tumbler at the end thereof. In the form of the invention illustrated the heater comprises a continuous circular heating tube having an inlet 41 and an outlet 42. The inlet may connect with a suitable source of heating fluid. This may be steam, hot water, or hot gases. The heater is located adjacent perforations 43 in the end wall of the cylinder. These perforations communicate with the interior of the hollow ribs 33. The ribs 33 in turn are perforated as indicated at 44. Preferably the number of perforations in the ribs 33 increases progressively away from the heater as illustrated in Fig. 1. Those perforations closest to the heater may also be made smaller than those farther away in order to equalize the distribution of heated air as it is discharged from the ribs into the cylinder.

In use of the device, garments to be dried are loaded into the receiving opening 29, when the door 30 is open. These may be garments which have been dry-cleaned or which have been laundered. The door 30 is then closed and the electric motor is started. This will cause rotation of the tumbler cylinder 25. It is preferred to have the speed of rotation in the neighborhood of 38 R. P. M. As the cylinder rotates, the ribs 33 will carry the garments upwardly until gravity causes the garments to fall back to the bottom of the cylinder. At the same time, with the suction fan 36 in operation, air from the exterior will be pulled past the heater tubes 40 into the perforations 43 and into the interior of the hollow ribs 33. This heated air will then be sucked out of the perforations 44 of the ribs into the interior of the cylinder, as indicated by the arrows in Fig. 1 and the garments will be subjected to the drying effect of this air as the garments are being acted upon by the rotating cylinder. The heated moisture laden air will ultimately be exhausted through the conduit 38 and out of the outlet 39. Due to the location of the exhaust conduit, the heated air will travel from the periphery of the cylinder toward the axis thereof to effectively wipe the garments within the cylinder. In constructions wherein the heated air is discharged through peripheral holes the air tends to travel to the periphery of the cylinder before it has

effectively contacted all portions of the garments in the cylinder. The present invention, therefore, due to the efficiency of the drying action, speeds up the drying operation.

Various changes and modifications may be made without departing from the spirit of the invention and all of such changes are contemplated as may come within the scope of the claims.

What we claim is:

1. A tumbler comprising a rotatable cylinder having a garment receiving opening at one end, an exhaust conduit communicating with the opposite end of the cylinder, said cylinder having air inlet openings in said opposite end positioned radially outwardly from the exhaust conduit, air heating means positioned radially outwardly from said exhaust conduit and adjacent said air inlet openings, means for causing movement of air from the exterior past said heating means, into said air inlet openings, and through the interior of the cylinder to said exhaust conduit, and means for distributing said air throughout the length of the cylinder.
2. A tumbler comprising a rotatable cylinder having a garment receiving opening, an exhaust conduit communicating with an end of the cylinder, said cylinder having air inlet openings in said end positioned radially outwardly from the exhaust conduit, air heating means positioned radially outwardly from said exhaust conduit and adjacent said air inlet openings, means for causing movement of air from the exterior past said heating means, into said air inlet openings, and through the interior of the cylinder to said exhaust conduit, and means for distributing said air substantially throughout the length of the cylinder.
3. A tumbler comprising a rotatable cylinder having a garment receiving opening, means for supporting an exhaust fan exteriorly of the cylinder and adjacent an end thereof, an exhaust conduit around which the cylinder rotates extending from said fan axially into said end of the cylinder, said cylinder having air inlet openings in said end positioned radially outwardly from the exhaust conduit, air heating means positioned radially outwardly from said exhaust conduit and adjacent said air inlet openings, means for causing movement of air from the exterior past said heating means, into said air inlet openings and through the interior of the cylinder to said exhaust conduit, and means for distributing said air in the cylinder.
4. A tumbler comprising a rotatable cylinder having a garment receiving opening at one end, an exhaust conduit communicating with the opposite end of the cylinder, said cylinder having air inlet openings in said opposite end positioned radially outwardly from the exhaust conduit, air heating means positioned radially outwardly from said exhaust conduit near the outer side of the end wall of the cylinder and adjacent the air inlet openings therein, means for causing movement of air past said heating means, into said air inlet openings, and through the interior of the cylinder to said exhaust conduit, and means for distributing said air in the cylinder.
5. A tumbler comprising a rotatable cylinder having a garment receiving opening at one end, an exhaust conduit communicating with the opposite end of the cylinder, said cylinder having air inlet openings in said opposite end positioned radially outwardly from the exhaust conduit, air heating means surrounding said exhaust conduit

and positioned adjacent said air inlet openings, means for supporting said heating means in fixed position, means for causing movement of air from the exterior past said heating means into said air inlet openings, and through the interior of the cylinder to said exhaust conduit, and means in the cylinder for distributing said air.

6. A tumbler comprising a rotatable cylinder having a garment receiving opening at one end, an exhaust conduit communicating with the opposite end of the cylinder, said cylinder having air inlet openings in said opposite end positioned radially outwardly from the exhaust conduit, circular air heating means surrounding said exhaust conduit, means for supporting said heating means so that the air inlet openings in the end of the cylinder are always near the heating means as the cylinder rotates, and means for causing movement of air from the exterior past said heating means, into said air inlet openings, and through the interior of the cylinder to said exhaust conduit.

7. A tumbler comprising a rotatable cylinder having a garment receiving opening at one end, an exhaust conduit communicating with the opposite end of the cylinder, hollow perforated garment lifting ribs in said cylinder, said cylinder having air inlet openings in that end wall with which the exhaust conduit connects, which openings communicate with the interior of said hol-

low ribs, air heating means positioned radially outwardly from said exhaust conduit and adjacent said air inlet openings and means for causing movement of air from the exterior past said heating means, into said air inlet openings and ribs, and through the interior of the cylinder to said exhaust conduit.

8. A tumbler comprising a rotatable cylinder having a garment receiving opening at one end, an exhaust conduit communicating with the opposite end of the cylinder, hollow perforated garment lifting ribs in said cylinder, said cylinder having air inlet openings in that end wall with which the exhaust conduit connects, which openings communicate with the interior of said hollow ribs, air heating means positioned radially outwardly from said exhaust conduit and adjacent said air inlet openings and means for causing movement of air from the exterior past said heating means, into said air inlet openings and ribs, and through the interior of the cylinder to said exhaust conduit, the effective size of the perforations in said ribs increasing progressively away from the air inlet openings to provide for distribution of air from said perforations throughout the length of the ribs.

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