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TUMBLER

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Fig. 1.

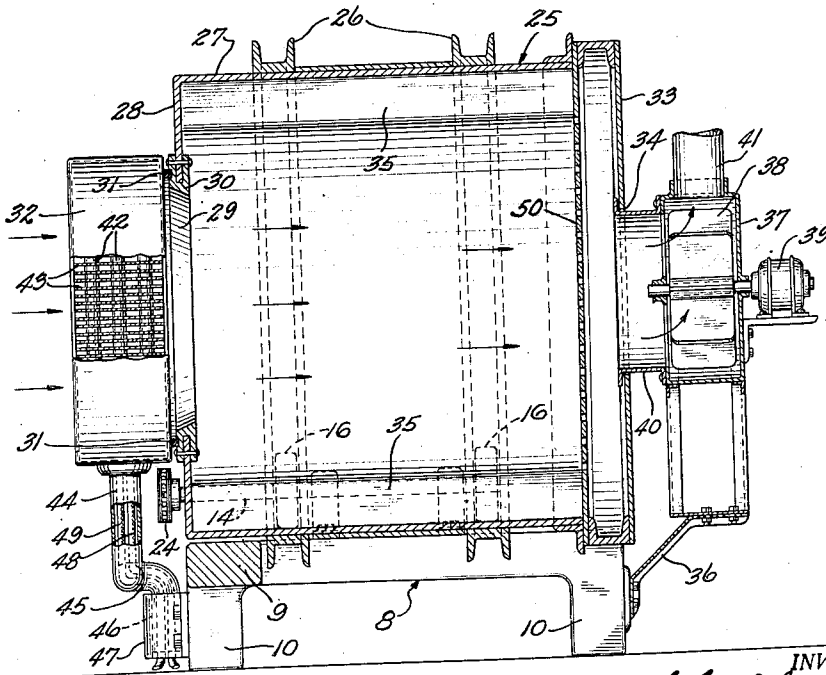
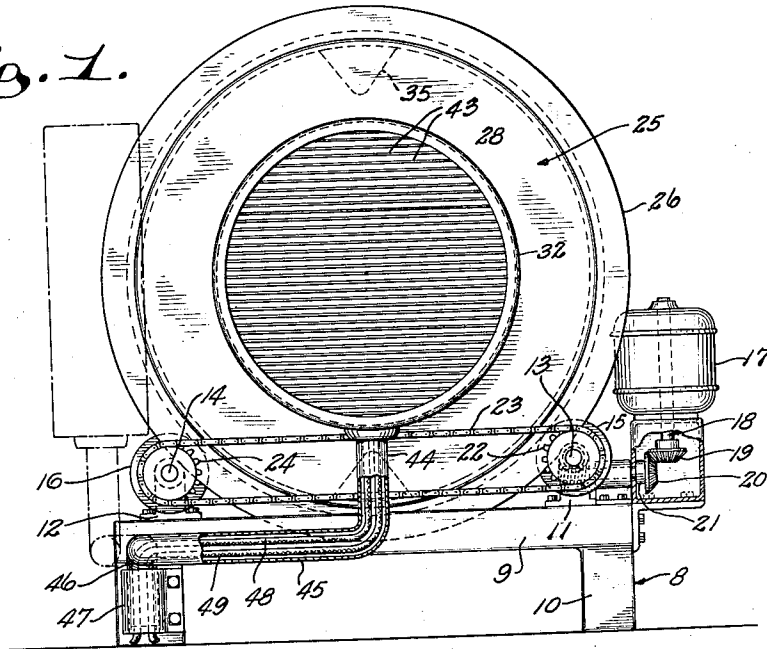


Fig. 2.

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TUMBLER

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8 Claims. (Cl. 34—132)

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 form 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 single 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 tumbler having a solid, unperforated peripheral wall, and having an end or garment receiving opening, together with means for causing movement of heated air from one end of the cylinder to the other.

A further object of the invention is to provide a construction as above described wherein the door for closing the garment receiving opening is in the form of a heater through which air may be drawn to enter the cylinder and act on the garments therein, there being a suction conduit in communication with the opposite end of the cylinder.

Other objects 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 inven-

tion in which the same reference numerals designate the same parts in all of the views:

Fig. 1 is a front elevational view of the improved tumbler, parts being broken away and shown in section and the dot-and-dash lines indicating the heater door swung to a position to expose the garment receiving opening; and

Fig. 2 is a vertical sectional view taken axially through the cylinder, the heater door, however, being shown in full except for the broken away casing portions.

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 a worm and worm-wheel connection, the shaft 13. The forward end of the shaft 13 is 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 the drum supporting rollers 15 and 16.

It is apparent, however, that in lieu of the driving arrangement shown the rollers 15 and 16 could be driven by any conventional means such as a V-belt, or a belt line shaft drive, without the necessity of a worm or wormwheel reduction. Or, suitable methods could be employed for driving the tumbler or drum 25 directly.

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. 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 outer side of the rim 30 of the opening may be formed with an outwardly projecting annular strip 31. This strip is flexible and is adapted to make wiping contact with the inner side of the non-rotatable door 32 when the cylinder is rotated. At the op-

posite end of the cylinder is a wall 33 formed with a central opening 34. The cylinder is also provided on its inner periphery with a plurality of garment lifting ribs 35. These ribs may be V-shaped in cross-section, as illustrated in Fig. 1. The cylinder 25, inwardly of the wall 33, has a perforated wall or sheet 36 which permits the passage of air from the tumbler through the exhaust fan, but serves to prevent clothes, garments, or material being dried within the drum from being sucked out through the exhaust fan, later to be described.

Supported on a bracket 36 which extends angularly upwardly from the base at the rear end of the cylinder is the housing 37 for a suction fan 38. This fan may be driven by an electric motor 39. A tubular conduit 40 which communicates with the interior of the fan housing 37 projects into the opening 34 at the end of the rotatable cylinder. The cylinder is, therefore, rotatable around the conduit portion 40. Another conduit 41 extends from the fan housing 37 to a suitable point of discharge.

The door 32 is in reality a unit heater and includes tubes 42 to which a heating fluid, such as hot water or steam, may travel. The tubes 42 support horizontal fins 43 or any suitable heat radiating means. The heater is open on both sides so that when the heater is in the position of Fig. 2, air from the outside may travel to the heater and to the cylinder, as indicated by the arrows in Fig. 2.

The heater door 32 is suitably mounted on the base so as to be swingable into and out of registration with the garment receiving opening 29. It is preferred to support the heater door on a tubular member having a vertical portion 44, a horizontal portion 45 and a vertical pivot portion 46. The pivot portion 46 is suitably supported in a bearing 47 so that the door may be swung from the full line closed position of Fig. 1 to the dot-and-dash line open position. A flexible inlet conduit 48 may deliver heating fluid to the tubes 42 of the heater and another flexible conduit 49 may serve as a return for the heating fluid. These conduits preferably extend through the tubular supporting member for the heater as shown in Fig. 1. If desired, the conduits 48 and 49 may be rigid pipes and there may be a swivel joint adjacent the bearing 47 so that heating fluid may be delivered to the pipes without interfering with the pivotal movement of the door support.

In use of the device, garments to be dried are loaded into the receiving opening 29 when the heater door is in the dot-and-dash line position of Fig. 1. These may be garments which have been dry-cleaned or which have been laundered. The heater door is then swung on the pivot 46 to the full line closed position and the electric motor 39 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 35 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 38 in operation, air from the exterior will be pulled through the heater to be heated by the tubes 42 and fins 43. This air will travel axially of the cylinder as indicated by the arrows in Fig. 2 directly into the exhaust conduit 40. Thus the drying air will travel the full length of the cylinder so that all of the garments will be subject to the drying effect of said air as the garments

are acted upon by the rotating cylinder. A maximum amount of moisture will be extracted from the garments before the heated air is exhausted. 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 all of the garments in the cylinder. The present arrangement, due to the efficiency of the drying action, therefore speeds up the drying operation.

It is apparent that by utilizing a heater for a door and by supporting the exhaust fan at the opposite end of the cylinder that a very simple construction has been provided. The usual outer casing which encloses the cylinder, heater and exhaust hoods, in the usual type of dryer, is unnecessary in the structure of the present invention. As a result the expense of manufacture is materially reduced. Notwithstanding this fact, the tumbler is highly efficient as before explained.

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 supporting base, a cylinder having an imperforate periphery rotatable on said base on a horizontal axis and having a garment receiving opening at one end concentric with the cylinder, a heater having air passageways extending therethrough, means for movably supporting said heater on said base for movement into and out of closing registration with said garment receiving opening, an exhaust conduit communicating axially with the opposite end of said cylinder, means providing for rotation of the cylinder on the axis of said heater and exhaust conduit while the latter remain stationary, and means for causing movement of air from the exterior through said heater and axially through the cylinder to said exhaust conduit when the heater is in registration with said garment receiving opening.

2. A tumbler comprising a supporting base, a cylinder rotatable on said base on a horizontal axis and having a garment receiving opening at one end, a unit heater having spaced heat exchange tubes and having air passageways extending through the heater past said tubes, and a tubular member swingable on said base and supporting said heater for movement into and out of closing registration with said garment receiving opening with the heat exchange tubes in front of said opening, conduits within said tubular member for conducting heating fluid to and from said heat exchange tubes of the heater, and means for causing movement of air from the exterior through said heater and into the cylinder to act on garments therein when the heater is in registration with said garment receiving opening.

3. A tumbler comprising a supporting base, a cylinder rotatable on said base on a horizontal axis and having a garment receiving opening at one end, a unit heater having spaced heat exchange tubes and having air passageways extending through the heater past said tubes, and a tubular member having one end pivoted to said base for pivotal movement on a vertical axis which is offset laterally from the longitudinal axis of the cylinder, said tube having its other end connected to and supporting said heater so that the latter is swingable in a horizontal plane with the tubular member into and out of closing registration with the garment receiving opening of the cylinder with the heat exchange tubes in

front of said opening, conduits within said tubular member for conducting a heating fluid to and from said heat exchange tubes of the heater and means for causing movement of air from the exterior through said heater and into the cylinder to act on garments therein when the heater is in registration with said garment receiving opening.

4. A tumbler comprising a rotatable cylinder having a garment receiving opening at one end and having an air outlet opening at the opposite end, said openings being concentric with the cylinder, a heater having air passageways extending therethrough and forming a door for closing said garment receiving opening, an exhaust conduit supported independently of said cylinder and cooperable with said air outlet opening of the cylinder so that the cylinder is rotatable around said exhaust conduit, and an exhaust fan within said exhaust conduit for causing movement of air in substantially straight lines from the exterior through said heater and longitudinally through the cylinder to said exhaust conduit.

5. A tumbler comprising a rotatable cylinder having a garment receiving opening at one end and having an air outlet opening at the opposite end, said openings being concentric with the cylinder, a heater having air passageways extending therethrough and forming a door for closing said garment receiving opening, means for supporting said door against rotation while the cylinder rotates, an exhaust conduit supported independently of said cylinder and cooperable with said air outlet opening of the cylinder so that the cylinder is rotatable around said exhaust conduit, and an exhaust fan within said exhaust conduit for causing movement of air in substantially straight lines from the exterior through said heater and longitudinally through the cylinder to said exhaust conduit.

6. A tumbler comprising a rotatable cylinder having a garment receiving opening at one end and having an air outlet opening at the opposite end, said openings being concentric with the cylinder and said cylinder having an unperforated peripheral wall, a heater having air passageways extending therethrough and forming a door for closing said garment receiving opening, an exhaust conduit supported independently of said cylinder and cooperable with said air outlet opening of the cylinder so that the cylinder is rotatable

able around said exhaust conduit, and an exhaust fan within said exhaust conduit for causing movement of air in substantially straight lines from the exterior through said heater and longitudinally through the cylinder to said exhaust conduit.

7. A tumbler comprising a rotatable cylinder having a garment receiving opening at one end and having an air outlet opening at the opposite end, said openings being concentric with the cylinder, a perforated partition within the cylinder adjacent to and in spaced relation from the end having the air outlet opening to define an auxiliary chamber between the partition and said end, a heater having air passageways extending therethrough and forming a door for closing said garment receiving opening, an exhaust conduit supported independently of the cylinder and cooperable with said air outlet opening so that the cylinder is rotatable around said exhaust conduit, and means for causing movement of air in substantially straight lines from the exterior through said heater and longitudinally through the cylinder and perforated partition to said exhaust conduit.

8. A tumbler comprising a supporting base, a cylinder rotatable on said base on a horizontal axis and having a garment receiving opening at one end and an air outlet opening at the opposite end, said openings being concentric with the cylinder, a unit heater having spaced heat exchange tubes and having air passageways extending through the heater past said tubes, a tubular member swingable on said base and supporting said heater for movement into and out of closing registration with said garment receiving opening with the heat exchange tubes in front of said opening, conduits within said tubular member for conducting heating fluid to and from the heat exchange tubes of said heater, an exhaust conduit supported independently of the cylinder and cooperable with said air outlet opening so that the cylinder is rotatable around said exhaust conduit and around the axis of said heater, and an exhaust fan within said exhaust conduit for causing movement of air in substantially straight lines from the exterior through said heater and longitudinally through the cylinder to said exhaust conduit.

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