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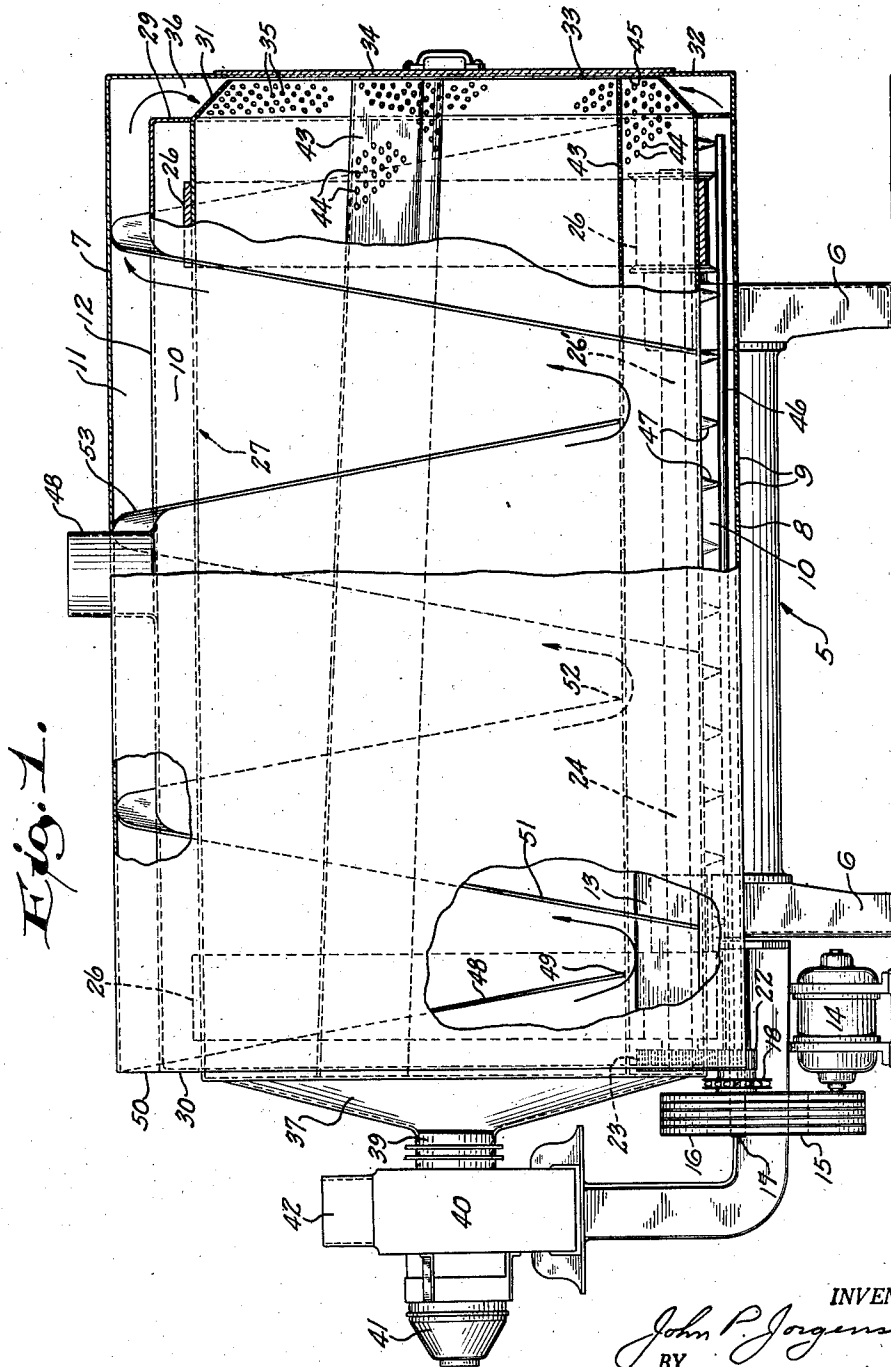
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TUMBLER

Filed Feb. 5, 1945

2 Sheets-Sheet 1



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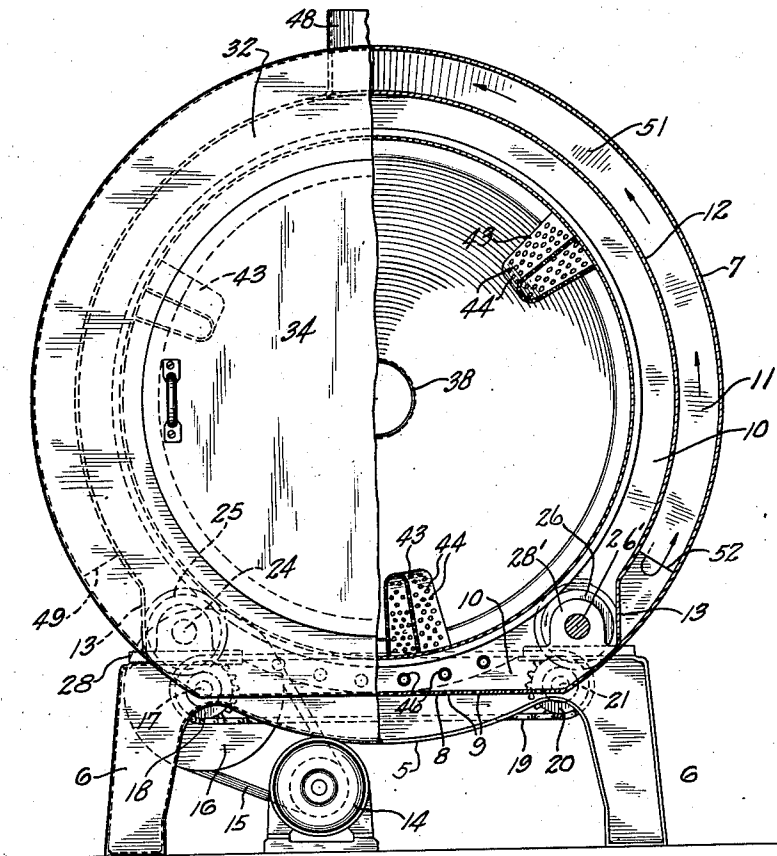


Fig. 2.

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UNITED STATES PATENT OFFICE

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TUMBLER

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8 Claims. (Cl. 34—133)

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This invention relates to improvements in tumblers.

It is a general object of the present invention to provide a rotating tumbler wherein there is novel heating means so arranged as to cause effective and rapid drying of garments within the tumbler.

A further object of the invention is to provide a tumbler wherein heat is applied to the exterior of the rotating drum while heated air currents are caused to circulate within the drum. With this arrangement, the heated currents in the drum remain at a higher temperature so that their capacity for absorbing moisture is greater.

A more specific object of the invention is to provide a tumbler as above described, wherein heat, such as that produced by a gas flame or steam coils, is applied to the exterior of the cylinder, either directly or by means of air currents which have been heated, while the cylinder rotates, there being a chamber surrounding the cylinder. Thus, the heat in the chamber not only raises the temperature of the drum but also tends to maintain the temperature of the air which is being circulated through the drum.

A further object of the invention is to provide as one embodiment of the tumbler above described, means such as baffles in a hot air chamber surrounding the cylinder for causing the air currents to travel in a circuitous course, before said air currents are admitted to the cylinder.

A still further object of the invention is to provide a construction as above described wherein the heated air currents may be admitted to the interior of hollow perforated ribs within the cylinder and also admitted directly into the cylinder. Thus, these air currents are caused to move both axially and transversely in the drum to effectively wipe garments therein and extract a maximum amount of moisture from the garments.

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 drawings, 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 view of the tumbler shown partially in side elevation and partially in vertical longitudinal section, various casing parts being broken away to better illustrate the invention, and

Fig. 2 is an end view of the device, part being broken away and shown in transverse section.

Referring more particularly to the drawings, illustrating an embodiment of the invention

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wherein a gas flame is utilized, the numeral 5 designates a suitable base having supporting legs 6. The base forms a cradle for supporting an outer shell or casing 7. The casing 7 is generally cylindrical in shape, except at the bottom where it is flattened, as at 8. This flattened bottom may be formed with air inlet openings 9 or in any other suitable manner to admit air to the heating chamber 10. The heating chamber 10 is separated from an outer hot air chamber 11 by means of a partially cylindrical shell 12. The hot air chamber 11 does not extend below the lower portion of the device but is closed off by longitudinal partitions 13.

An electric motor or other suitable driving means 14 is connected by endless belts 15 with a pulley 16 on a shaft 17. The shaft 17 has rigidly mounted thereon a sprocket wheel 18, and the latter is connected by an endless chain 19 with a sprocket wheel 20 rigidly connected to a shaft 21. Also rigidly mounted on the shaft 17 is a gear 22 which meshes with a gear 23 on a shaft 24. The shaft 24 is journaled in suitable bearings 28 and extends longitudinally of the device through the lower portion of the heating chamber 10. Rollers 25, rigidly mounted on the shaft 24, engage tracks 26 on the exterior of a drum or garment cylinder 27 to support the cylinder and cause rotation thereof. On the other side of the drum, referring to Fig. 2, the drum is similarly supported on rollers 26 rigidly mounted on a shaft 26', and the latter shaft is journaled in bearings 28' and is driven by a suitable gear connection with the sprocket shaft 21. It is thus apparent that the garment cylinder 27 is supported on four rollers 25 and 26 and is caused to rotate on a horizontal axis when the motor 14 is in operation.

The intermediate shell 12 has an inwardly directed annular flange 29 at its front end and a similar annular flange 30 at its rear end. The front end of the drum 27 has an angled frustro-conical flange 31 which projects through the end opening of the shell 12 and which terminates closely adjacent to the front end 32 of the outer casing 7. This front end 32 of the outer casing is formed with a garment opening 33 which is normally closed by a door 34. The opening 33 in the casing 7 registers with the end opening of the rotating cylinder 27. The tapered flange 31 of the rotating drum is perforated, as at 35, to receive heated air from a front chamber 36. The front chamber 36 is in communication with the outer air heating chamber 11.

Any means such as a suitably positioned blower or suction fan may be used to cause movement of

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the air currents. In the preferred embodiment the rear end of the drum 27 projects a short distance from the rear end of the outer shell 7 and is formed with an outwardly belled end head 27 having a central opening 38 which communicates with a conduit 39 leading from a suction fan 40. The suction fan may be driven by its own motor 41. Air from the suction fan may be exhausted through an outlet 42.

Within the drum 27 are a plurality of hollow garment lifting ribs 43 which are perforated, as at 44, throughout their length. The inner ends of the ribs are closed, and the outer ends are open, as at 45. These ribs preferably extend at spiral angles, as indicated.

Any suitable means may be utilized for applying heat or heated air currents to the exterior of the drum as the latter rotates. In the preferred form of the invention this heating means takes the form of a plurality of longitudinally extending heating members 46 such as gas burners below the heating chamber. Air for combustion may enter through the bottom openings 9 and the flames 47 from the gas burners where gas burners are used are directed against the periphery of the drum. If steam coils are employed air entering the bottom openings 9 is heated and this air circulates around the drum. Where gas burners are employed, there may be a flue 48 connected to the top of the heating chamber 10 for directing used gases of combustion to a suitable outlet.

Within the air heating chamber 11, it is preferred to utilize means for directing heated air in a circuitous course before it is admitted to the interior of the drum. Referring to Fig. 1, there is a spiral baffle 49 extending downwardly near the inner end and within the chamber 11. The width of the baffle is preferably equal to the thickness of the chamber 11. The baffle terminates short, as at 49, so that air admitted to the open end 50 of the chamber 11 may pass around the lower end of the baffle 49. Another baffle 51 extends upwardly from the longitudinal partition 13 to direct the heated air currents upwardly again. This baffle 51 spirals around to the other side of the drum and terminates at 52. Heated air currents passing beneath the end 52 on the far side of the drum, referring to Fig. 1, are directed upwardly again by a baffle 53, which extends back around to the near side of the drum and which terminates short so that heated air currents can pass around its lower end and back in an upwardly direction. The heated air currents are eventually directed into the front chamber 35. Some of these air currents pass through the perforations 35 directly into the drum. Other air currents pass through the perforations into the interior of the hollow perforated ribs 43. Inasmuch as these ribs are closed at their inner ends, the heated air will eventually move out of the openings 44 of the ribs into contact with garments within the drum. Movement of the air currents through the chamber 11 and through the drum is, of course, caused by the suction fan 40.

In use of the form of device illustrated, when the door 35 is open, garments to be dried may be inserted into the interior of the rotatable cylinder 27. The door 34 is then closed and the motors 14 and 41 are started in operation. As the drum rotates, the garment-lifting ribs 43 will cause the garments to tumble back and forth in the cylinder. At the same time, with the heating members 46 in operation, heat is applied to the exterior of the rotating cylinder 27. In case steam

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coils or other heating means is used in lieu of gas burners, the heat from such other heating means will likewise cause heating of the exterior of the cylinder. Where gas burners are employed, as in the illustrated embodiment, the used gases of combustion pass upwardly on both sides of the cylinder in the chamber 10 and are exhausted through the flue 48. These rising flue gases in the heating chamber 10 not only heat the exterior of the garment cylinder but also transfer heat through the wall 12 to the air heating chamber 11. Air admitted into this chamber through the end opening 50 is caused by the baffles 48, 51 and 53 to travel in a circuitous course so that the air extracts a maximum amount of heat from the heating chamber 10. The suction fan 40 causes a continuous movement of these air currents and causes the currents to enter the front end of the rotating cylinder through the apertured flange 31. Some of these air currents travel longitudinally through the drum to the outlet conduit 39. Other heated air currents pass through the perforations of the flange 31 and enter the interior of the hollow ribs 43. Due to the fact that the inner ends of these ribs are closed, these heated air currents are pulled out of the perforations 44 in the ribs so that they originally move in directions at right angles to the air currents flowing longitudinally through the drum. In this way the garments which are being tumbled about in the rotating cylinder are very effectively wiped by the heated air currents. In addition, all of the air within the rotating cylinder is heated because of the application of heat to the periphery of the cylinder. This also tends to prevent a reduction in temperature of the heated air currents as they pass through the drum. It is apparent, therefore, that very effective extraction of moisture from the garments results.

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 I claim is:

1. A tumbler comprising a garment-receiving cylinder mounted for rotation on a substantially horizontal axis, means forming a heating chamber surrounding the periphery of said cylinder and within which said cylinder is rotatable, means forming a hot air chamber which is substantially an inverted U in cross section positioned radially outwardly from said heating chamber to which heat is transferred from the heating chamber, heating means in the lower portion of the heating chamber which is not surrounded by the hot air chamber for directly heating the cylinder as the latter rotates, and means for causing circulation of heated air from said hot air chamber into and through the cylinder.

2. A tumbler comprising a garment-receiving cylinder mounted for rotation on a substantially horizontal axis, means forming a heating chamber surrounding the periphery of said cylinder and within which said cylinder is rotatable, means forming a hot air chamber which is substantially an inverted U in cross section positioned radially outwardly from said heating chamber to which heat is transferred from the heating chamber, heating means in the lower portion of the heating chamber which is not surrounded by the hot air chamber for directly heating the cylinder as the latter rotates, means for causing circulation of heated air from said hot air chamber into and

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MILES PER GALLON METER

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