F. M. WATKINS.

DRYING TUMBLER.

APPLICATION FILED JAN. 17, 1920.

1,355,293.

Patented Oct. 12, 1920.

Fig. 1.

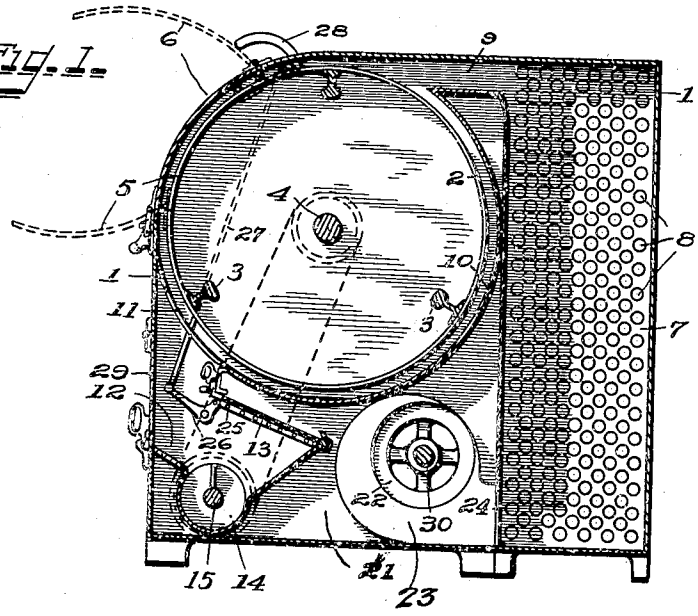



Fig. 2.

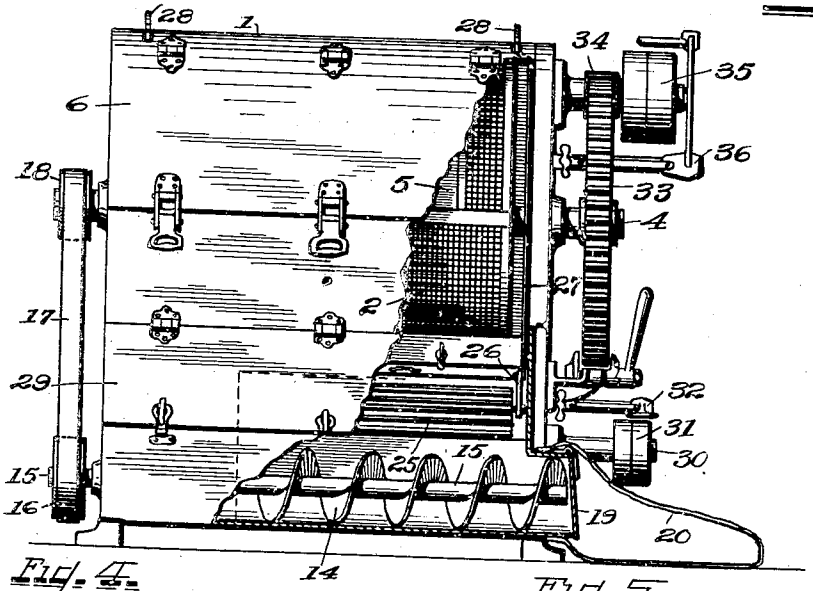



Fig. 3.

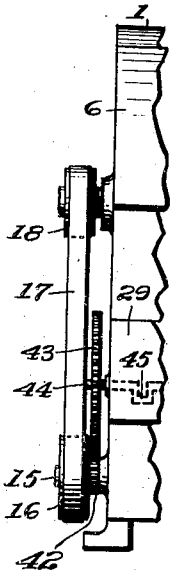



Fig. 4.

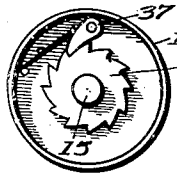
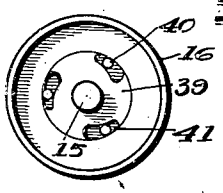



Fig. 5.




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# UNITED STATES PATENT OFFICE.

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## DRYING-TUMBLER.

1,355,293. Specification of Letters Patent. Patented Oct. 12, 1920.

Application filed January 17, 1920. Serial No. 352,239.

*To all whom it may concern:*

Be it known that I, FRANK M. WATKINS, a citizen of the United States, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Drying-Tumblers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification.

My invention relates more particularly to the machines for use in laundries where large quantities of clothes are washed and wherein it is desirable to thoroughly aerate and dry the clothes in the shortest possible time, though it is capable of advantageous use for a variety of other purposes as will be readily apparent to those skilled in the art to which my invention relates.

One object of my invention is the provision and arrangement of a screen for collecting the lint which may be removed from the articles being operated upon and to so locate this screen that the lint will be collected on its under surface where it will release itself from the screen when the machine is at rest.

Another object of my invention is the provision of an automatic scraping mechanism for assisting in the removal of the lint from the screen.

Another object of my invention is the provision of a suitable lint receiving compartment which is provided with means for automatically removing the lint therefrom and conducting it away from the machine.

Other objects of my invention will appear and be described throughout the specification.

In the drawing:—

Figure 1 is a sectional side elevation of the machine embodying my invention in one form of construction.

Fig. 2 is a front elevation of the machine with some of its parts removed.

Fig. 3 is a front elevation of the left end of Fig. 2 showing a modified form of means for operating the screen cleaner.

Fig. 4 is an end view of one form of ratchet for operating the lint conveyer.

Fig. 5 is a view corresponding to Fig. 4 of another form of mechanism for operating the lint conveyer.

The same numerals of reference are used to indicate identical parts in all the figures.

For purposes of illustration and to show one form of machine in which my invention may be embodied, 1 represents the main frame or housing within the upper forward part of which the cylinder 2 is mounted. The outside surface of the cylinder is preferably formed of heavy wire-mesh so that air can freely pass into and out of the cylinder. The surface of the cylinder is supported by a plurality of ribs 3 arranged on the inside thereof, these ribs serving also as means for agitating the contents of the cylinder. The cylinder 2 is supported by means of a shaft 4 which is suitably journaled in the ends of the main frame or housing 1. The cylinder is also provided with a loading and unloading door 5 shown closed in full lines and opened in dotted lines of Fig. 1 the case 1 being also provided with the door 6 which is also shown closed in full lines and opened in dotted lines and while I have shown the door 6 as hinged at its upper edge and the door 5 as hinged at its lower edge, it is apparent that these mountings may be reversed or that either one of them may be reversed.

The rear portion of the machine is arranged as a heating coil compartment 7 within which the heating-coil 8 is mounted, the compartment 7 communicating as by passage 9 with the cylinder compartment 10, the latter being provided with an opening 11 located substantially opposite the exit end of the passage 9, the opening 11 communicating with a lint chamber 12 which is provided with a screen 13 on the under side of which the lint which passes from the contents of the cylinder 2 is collected.

The lower portion of the lint chamber 12 is shaped to form a channel within which a conveyer 14 is mounted, the conveyer in this instance being shown as a spiral conveyer which is mounted on a shaft 15 and driven by pulley 16, belt 17 and pulley 18 mounted on the shaft 4 of the cylinder 2 in such manner that as the cylinder 2 revolves the conveyer 14 is operated to carry the lint from the lint chamber 12 to a point outside the machine.

The exit from the lint chamber 12 is preferably closed by a swinging door 19 Fig. 2, to prevent the inrush of air into the machine and a lint receiving bag 20 is detachably mounted on the extension of the

lint chamber 12 on which the swinging door 19 is mounted, the construction and arrangement of these parts being such that as the lint is forced out of the machine by the conveyer 14 it is collected in the bag 20 which may, upon being filled, be removed from the machine and another bag substituted for it and the operation continued.

The lint chamber 12 communicates, through the screen 13 with the blower chamber 21 within which a centrifugal or other type of blower 22 may be mounted, the blower 22 being inclosed in a case 23 the discharge of which communicates, through an opening 24 with the chamber 7, the course of the air through the machine being indicated by the arrows in Fig. 1.

Suitable connections, not shown, supply the heating coils 8 with steam or other heating medium so that as the air passes through the coil chamber 7 it is thoroughly heated before being delivered to the passage 9 and then through the cylinder 2, lint chamber 12, blower chamber 21, and blower mechanism previously described, it being understood that the air in passing through the cylinder 2 removes the moisture from the contents of the cylinder as well as carrying away the lint from the contents thereby thoroughly aerating and drying the contents of the cylinder.

As a means whereby the lint which may collect on the under surface of the screen 13 may be removed from the machine I have shown a grid 25 which is mounted in close proximity to the screen 13 and the grid 25 being connected, for operation, to the bell-crank 26, the latter being connected through rod 27 to operating arm 28 which is suitably mounted on the interior of the case of the machine and projects through the outside of the casing to a point within normal travel of the door 6 so that when the latter is open to load or unload the machine, the mechanism just described will be operated to cause the grid 25 to move with relation to the screen 13 thereby removing the lint from the screen and causing it to fall to a position where it will be handled by the conveyer 14 and be thus conveyed outside of the machine.

A door 29 establishes communication with the lint chamber 12 so that the parts therein may be inspected or removed should occasion require.

The shaft 30 of the blower 22 is extended to a point outside the machine and is preferably provided with tight and loose pulleys 31 so that the operation of the blower may be started or stopped at will, any suitable belt-shifting mechanism 32 being provided for the purpose of controlling the position of the drive-belt.

The shaft 4 may be provided with any suitable driving gear 33 which is driven by a pinion 34, the latter being driven by tight and loose pulleys 35, the belt for which may be handled by any suitable shifting mechanism 36 so that the operation of the cylinder 2 may be started or stopped at will.

In some instances it is desirable to impart only a partial revolution or a given number or revolutions in one direction to the cylinder 2 and then to reverse its rotation and in such installations it is required that means be provided whereby the conveyer 14 will always rotate in the same direction and in order to accomplish such a result the pulley 16 may carry a pawl 37 which engages a ratchet 38 mounted on the shaft 15 as shown in Fig. 4, the construction and arrangement of these parts being such that as the cylinder 2 rotates in the direction in which the conveyer 14 must rotate in order to properly perform its functions, the pawl 37 will engage the ratchet 38 and thereby rotate the shaft 15 and with it the conveyer 14; and that when the cylinder 2 rotates in the reverse direction the pawl 37 will be disengaged from the ratchet 38 during the reverse movement at the end of which it will again engage the ratchet 38 to rotate the conveyer 14 in the proper direction.

In Fig. 5, I have shown a modified form of driving and releasing mechanism for the shaft 15 in which the pulley 16 is bored to receive the roller clutch member 39 which carries a plurality of rollers 40 mounted in eccentrically arranged pockets 41 so that as the pulley 16 rotates in the direction proper for the operation of the conveyer 14 one or more of the rollers 40 will drop to the restricted portion of its pocket 41 and comes in contact with the bore of the pulley 16 thereby causing the rotation of the shaft 15; and when the cylinder 2 and consequently the pulley 16 is rotated in the opposite direction, its movement will release the roller 40 which is in engagement with the bore of the pulley 16 thereby permitting the shaft, 15 to remain at rest during the reverse movement of the parts just described.

Should it be desired to operate the grid 25 irrespective of the opening of the doors of the machine, the shaft 15, as shown in Fig. 3, may be provided with a pinion 42 with which a gear 43 meshes, this gear being mounted on a crank shaft 44, the cranks 45 of which may be connected through suitable connecting rods with the grid 25, thereby imparting to the latter a reciprocating motion during the operation of the machine.

While I have shown and described a machine more particularly arranged and adapted for down draft operation, in which the air passes through the cylinder 2 from the upper portion thereof to the lower portion, it is apparent that the arrangement of the various parts may be such that the

principles employed may be incorporated in an up draft machine such as is shown in my pending application which was filed on Nov. 12, 1917, and bears Serial No. 201,438.

Having thus fully described my invention, I claim:

1. In a drying tumbler comprising a clothes containing element through which air may pass and an air moving element for forcing the air through the machine, and an air heating element for heating the air, the combination of an air and lint receiving chamber partly formed as a housing for a conveyer, a lint screen covering the outlet from said chamber, a conveyer mounted in said chamber, means for operating said conveyer, and connections operated by the opening of the loading door for removing the lint from said screen.

2. In drying tumblers comprising a moving clothes containing element through which air may pass and an air moving element and a heating element, the combination of an air and lint receiving chamber, a lint screen for said chamber, lint removing mechanism mounted on said chamber and coöperating with said screen and a lint conveyer for removing the lint from the machine.

3. In drying tumblers comprising a clothes containing element through which air may pass and an air moving element and a heating element, the combination of a lint receptacle for receiving air and lint passing from the clothes containing element, a lint screen mounted at the outlet of the lint receptacle whereby the air and lint passing through said receptacle come in contact with the lower surface of said screen, means for removing the lint from said screen, and a lint conveyer for carrying the lint out of the machine.

4. In a drying tumbler comprising a clothes containing element, and an air moving element and an air heating element, the combination of an air lint receiving chamber, a lint screen mounted in the upper portion of said chamber whereby the air passing out of said chamber passes through said screen from the lower side thereof, lint removing mechanism co-acting with the lower side of said lint screen and operated by the operation of a portion of the machine and a lint conveyer for removing the lint from the machine.

5. In drying tumbers the combination of a housing containing a loading door, a clothes container adjacent the loading door of said housing, an air moving element, a heating element, an air and lint receiving chamber, a lint screen mounted in said chamber over the outlet therefrom, and a lint removing device for removing the lint from said screen and operated by the operation of said loading door.

6. In drying tumblers the combination of a housing containing a load door, a clothes container adjacent the loading door of said housing, an air moving element, a heating element, an air and lint receiving chamber, a lint screen mounted in said chamber over the outlet therefrom, a lint removing device for removing the lint from said screen and operated by the operation of said loading door, and a conveyer for removing the lint from the machine.

7. In a drying tumbler the combination of a moving clothes containing element, an air moving element, a heating element, a lint receiving chamber, a lint conveyer in said chamber, and one way driving connections between a moving portion of the machine and the lint conveyer for driving the conveyer in a direction to cause the removal of the lint from the machine.

8. In a drying tumbler the combination of a housing, a loading door, a clothes receptacle mounted within said housing and adjacent said door, an air moving element, an air heating element, a lint receptacle, a lint screen mounted over the outlet from said lint receptacle, a lint removing mechanism coöperating with said screen and operated by the movement of said charging door, a lint conveyer, and one way driving connections for said lint conveyer whereby it may be operated to remove the lint from the machine.

9. In a drying tumbler the combination of a clothes containing element, means for passing heated air through said element and its contents, a lint receptacle adjacent the outlet from the clothes containing element, a lint screen mounted at the outlet from the lint receptacle, lint removing mechanism co-operating with said screen, and means for periodically operating the lint removing mechanism to clean the screen.

10. In a drying tumbler the combination of a clothes containing element, means for passing heated air through said element and its contents, a lint receptacle adjacent the outlet from the clothes containing element, a lint screen mounted at the outlet from the lint receptacle, lint removing mechanism co-operating with said screen, and means for periodically operating the lint removing mechanism from outside the machine.

11. In a drying tumbler the combination of a clothes containing element, means for passing heated air through said element and its contents, a lint receptacle adjacent the outlet from the clothes containing element, a lint screen mounted at the outlet from the lint receptacle, lint removing mechanism co-operating with said screen, means for periodically operating the lint removing mechanism to clean the screen, and a lint conveyer for carrying the lint out of the machine.

12. In a drying tumbler the combination of a clothes containing element, means for passing heated air through said element and its contents, a lint receptacle adjacent the outlet from the clothes containing element, a lint screen mounted at the outlet from the lint receptacle, lint removing mechanism co-operating with said screen, means for periodically operating the lint removing mechanism from outside the machine, and a lint conveyer for carrying the lint out of the machine.

FRANK M. WATKINS.