J. H. OSTERTAG.

DRYING TUMBLER.

APPLICATION FILED JAN. 29, 1917.

1,253,520. Patented Jan. 15, 1918.

2 SHEETS—SHEET 1.

Fig. 1.

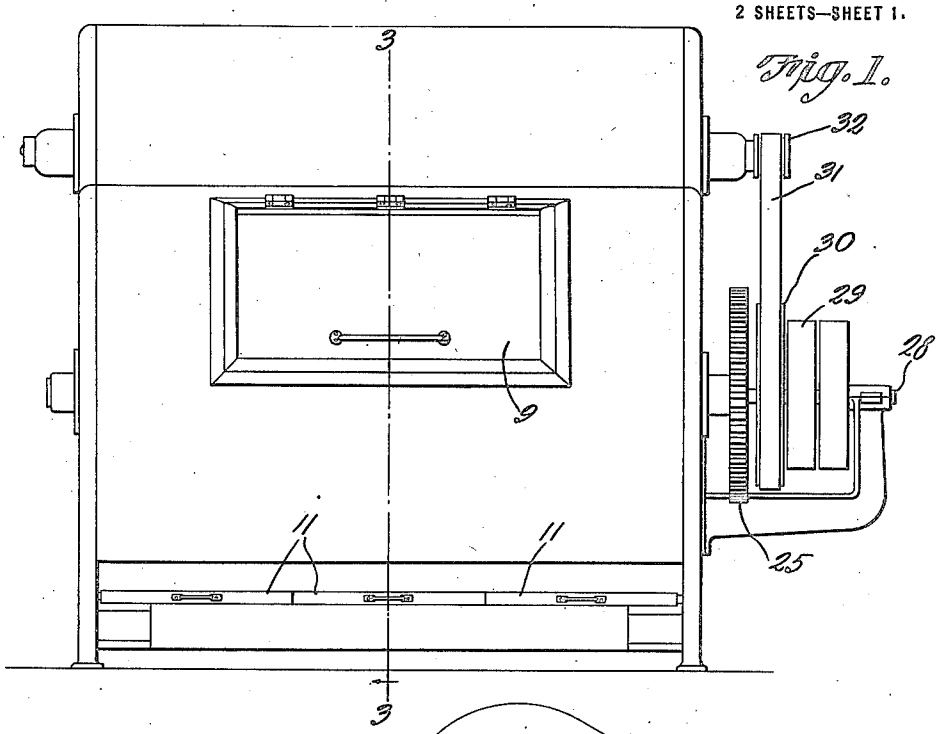
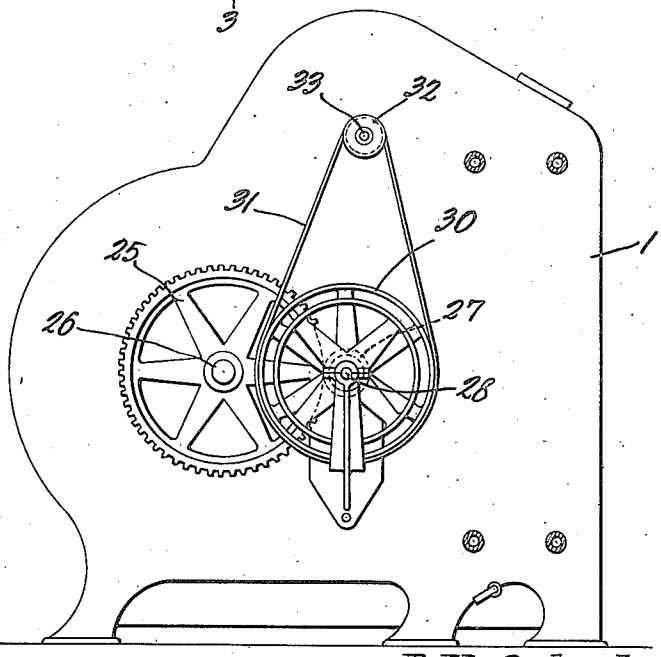


Fig. 2.



Witness

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2 SHEETS—SHEET 2.

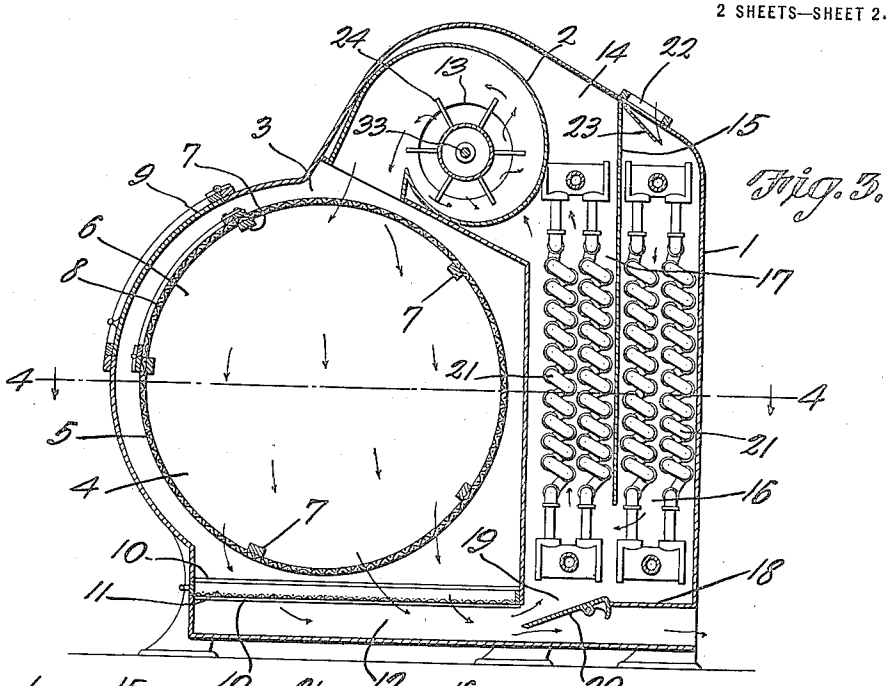


Fig. 3.

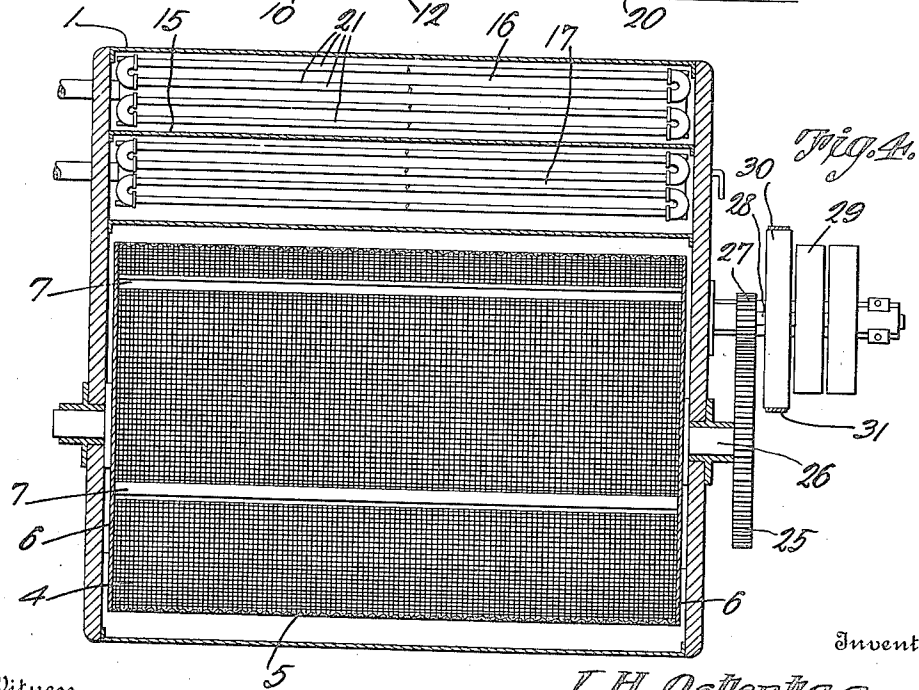


Fig. 4.

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UNITED STATES PATENT OFFICE.

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DRYING-TUMBLER.

1,253,520. Specification of Letters Patent. Patented Jan. 15, 1918.

Application filed January 29, 1917. Serial No. 145,240.

To all whom it may concern:

Be it known that I, JOHN H. OSTERTAG, a citizen of the United States, residing at Columbia, in the county of Lancaster and State of Pennsylvania, have invented a new and useful Drying-Tumbler, of which the following is a specification.

This invention relates to drying tumblers primarily designed for laundry purposes, one of the objects of the invention being to reduce the cost of operating the apparatus without impairing its efficiency.

A further object is to provide means whereby a forced circulation of heated air can be set up through the fabrics to be dried and said air used over and over again so that it can be maintained at a desired temperature without maintaining the steam pressure which would otherwise be necessary.

A still further object is to provide means whereby the air for heating purposes is under constant control, it being possible to retain the dry heated air after it has been passed through the fabrics so as to be used over again, while the moisture laden air leaving the fabrics can be expelled from the machine.

A further object is to provide simple and efficient means whereby any lint which may be freed from the fabrics during the drying operation will be collected so that it will not be carried with the reheated air into the apparatus and clog or otherwise impair the efficiency of the machine.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, can be made within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawings the preferred form of the invention has been shown.

In said drawings:—

Figure 1 is a front elevation of the machine.

Fig. 2 is a side elevation thereof.

Fig. 3 is a section on line 3—3 Fig. 1.

Fig. 4 is a section on line 4—4 Fig. 3.

Referring to the figures by characters of reference 1 designates a housing in the upper portion of which is provided a blower casing 2 extending transversely thereof and which discharges downwardly into a compartment 3. A tumbler or drum 4 is mounted for rotation in this casing, said drum being preferably formed of a heavy wire mesh 5 secured to solid heads 6, there being spaced cleats 7 along the inner surface of the mesh extending from one head to the other, these cleats serving to engage the fabrics during the rotation of the drum or tumbler, thus to elevate said fabrics to a certain level after which they will fall to the lowermost portion of the drum or tumbler. A door 8 is movably connected to the drum and forms a portion of the periphery thereof. This door is adapted to be brought into position directly back of another door 9 formed in the front wall of the housing 1. Thus when the two doors are arranged one behind the other and are opened, fabrics can be readily placed in or removed from the drum 4.

Arranged under the drum or tumbler 4 are guide cleats 10 which extend from the front wall of the housing 1 back to the lower edge portion of the back wall of compartment 3. These cleats support drawers 11 the bottoms of which are formed of wire fabric so as to constitute screens. Any desired number of these drawers may be used, the same being arranged close together and side by side as shown particularly in Fig. 1 and coöperating to form a foraminous partition between the compartment 3 and a flue 12 which extends from the front to the back of the housing and passes under the rear wall of the compartment 3. This flue is open at its back end.

The blower casing 2 has air inlets 13 at the sides thereof designed to receive air from the compartment 14 which is formed in the upper portion of the housing 1 and above the compartment 3.

A partition or diaphragm 15 extends downwardly from the top of the housing 1 and between the back of the housing and the back wall of the compartment 3 and thus forms two heating chambers 16 and 17 which communicate at their lower ends. The bottom of the chamber 16 is closed by a transverse partition 18, but the bottom of the chamber 17 has an inlet opening 19 in communication with the flue 12 and which opening can be partly or entirely closed by a pivoted damper 20 extending throughout

the width of the flue 12. This damper may be operated in any suitable manner and is adapted either to entirely close the opening 19, to partly close said opening, or to close communication between the flue 12 and its rear outlet. This damper, when partly or entirely opened, serves to deflect upwardly into the heating chamber 17, the heated air discharged into the flue 12. If the damper is only partly open, as shown in Fig. 3, the upper stratum of heated air within flue 12 will be directed upwardly into the heating chamber 17, while the lower stratum of heated air will be free to flow under the damper and pass out into the atmosphere.

Heating means such as steam coils 21 are arranged within the two heating chambers 16 and 17.

The compartment 16 is provided at its upper end with an air inlet 22 and the passage of air through this inlet may be controlled by a damper 23 which can be operated in any manner desired.

The mechanism employed for driving the blower 24 and the cylinder or tumbler 4 may be of any desired construction and arrangement. In the structure illustrated, a larger gear 25 is secured to one of the gudgeons 26 of the drum and receives motion through a small gear 27 from a shaft 28 adapted to be driven by a belt engaging a pulley 29 on the shaft. Another pulley 30 is secured to this shaft and transmits motion through a belt 31 to a small pulley 32 on the shaft 33 of the blower. Obviously, any other desired arrangement of driving mechanism can be used.

In using the apparatus, the steam or other heating medium is directed into the compartments 16 and 17 and the fabrics to be dried are placed in the drum 4, after which the apparatus is closed and the damper 20 is moved upwardly so as to completely close the opening 19. The drum or tumbler and the blower are then set in operation with the result that the fabrics will be agitated and a blast of air will be directed downwardly through them and into the flue 12. Air is supplied to the blower casing from the inlet 22 and flows downwardly therefrom between the coils 21 in compartment 16 and thence upwardly between the coils in compartment 17 to the chamber 14. The air thus heated will convey moisture from the fabrics and will be discharged outwardly from the flue 12. After a large percentage of the moisture has thus been removed, the damper 20 can be lowered so as to partly close the flue 12. This will result in the upper stratum of heated air in the flue 12 being deflected upwardly into the compartment 17 where it is reheated and used over again, it being combined with a reduced amount of fresh air admitted through the port 22. The balance of the warm air which is heavily laden with moisture and constitutes the lower stratum within the flue 12 will pass outwardly into the external atmosphere. As the moisture driven off is reduced in amount, the damper 20 can be further lowered until finally the flue 12 will be completely closed to its outlet and all of the air directed into the flue will be deflected upwardly into the compartment 17 and reused. Obviously during the drying operation considerable lint will be removed from the fabrics. This lint, however, will be collected in the drawers or trays 11 and will not enter the heating chambers where it might cling to the coils and interfere with the heating operation. The trays can be removed as desired so as to be cleaned of the accumulated lint.

Importance is attached to the fact that the upper stratum of air discharged into the heating flue can be re-used or, if desired, all of the heated air in said flue can be re-used, this resulting in a considerable saving in fuel because of the reduced consumption of steam or other heating medium employed.

The apparatus is very compact and efficient and is advantageous not only because of the saving in fuel which results from the reheating of the dry warm air, but also because of the rapidity with which the drying operation can be completed.

What is claimed is:—

1. A drying tumbler including a revoluble container, a heating chamber having an inlet, means for sucking air through the heating chamber and expelling it through the revoluble container, an elongated flue for the reception, at one end, of warm air leaving the container, said flue having an outlet at its other end to the external atmosphere, and means adjacent said outlet for opening and closing communication between said flue and the heating chamber.

2. In a drying tumbler, a revoluble fabric container, a heating chamber having an air inlet, means for sucking air through said chamber and directing it downwardly through the container, an elongated outlet flue for receiving, at one end the warm air from the container, said flue, at its other end, discharging normally into the external atmosphere, and means adjacent said outlet for deflecting the upper stratum of air in said flue upwardly into the heating chamber.

3. In a drying tumbler, a revoluble fabric container, a heating chamber having an air inlet, means for sucking air through said chamber and directing it downwardly through the container, an elongated outlet flue for receiving, at one end, the warm air from the container, and allowing the air to separate into an upper dry stratum and a lower moist stratum, said flue, at one end, discharging normally into the external atmosphere, and means close to said outlet for

deflecting the upper stratum of air in said flue upwardly into the heating chamber, said means constituting a closure for the discharge end of the flue.

4. A drying tumbler including a revoluble container, separate heating compartments communicating at their lower ends, one of said compartments having a fresh air inlet, means for withdrawing heated air from the other compartment and directing it through the container, a flue for receiving heated air from the container, said flue extending under the heating compartments and having an outlet to the external atmosphere, and means for deflecting upwardly into one of the heating compartments the upper stratum or all of the air contained within the flue, said means constituting a closure between the flue and the heating compartment.

5. A drying tumbler including a revoluble foraminous container, separate heating compartments communicating at their lower ends, one of said compartments having a fresh air inlet at its upper end, means for withdrawing heated air from the upper end of the other compartment and directing it downwardly into and through the container, a flue for receiving heated air from the container, said flue extending under the heating compartments, and means for deflecting the upper stratum or all of the air from said flue into one of the heating compartments.

6. A drying tumbler including a revoluble foraminous container, separate heating chambers communicating at their lower ends, one of said chambers having a fresh air inlet at its upper end, means for withdrawing heated air from the upper end of the other chamber and directing it downwardly through the container, a flue for receiving heated air from the container, said flue extending under the heating chamber, separating means interposed between the flue and the container, and means for deflecting into one of the heating chambers the upper stratum or all of the heated air within the flue.

7. A drying tumbler including a revoluble foraminous container, air heating means, means for directing the heated air downwardly through the container, an elongated horizontal flue for receiving said air and effecting its separation into an upper dry stratum and a lower moist stratum and means for directing to the heating means the upper stratum or all of the air leaving the container.

8. A drying tumbler including a revoluble foraminous container, air heating means, means for directing the heated air downwardly through the container, an elongated flue for receiving said air and effecting its separation into an upper dry stratum and a lower moist stratum, means for directing to the heating means the upper dry stratum or all of the air leaving the container, and means for separating lint from the air when leaving the container and before entering the flue.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JOHN H. OSTERTAG.

Witnesses:
JOHN B. WISLER,
CHAS. W. STEVENSON.