May 4, 1937. F. J. COUCH 2,079,280

CONTINUOUSLY CONDITIONING TUMBLER

Original Filed June 12, 1933 3 Sheets-Sheet 1

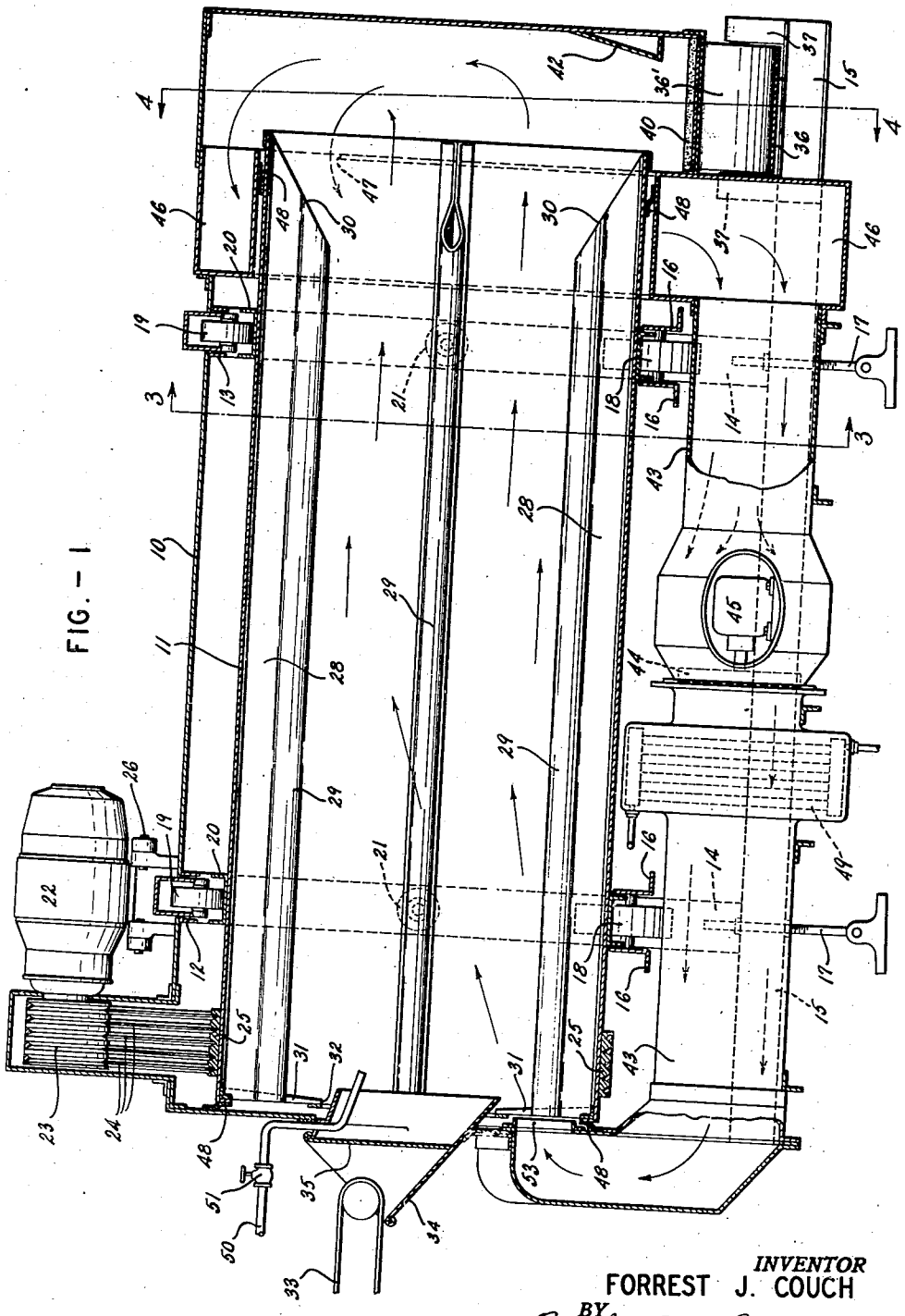


FIG. - 1

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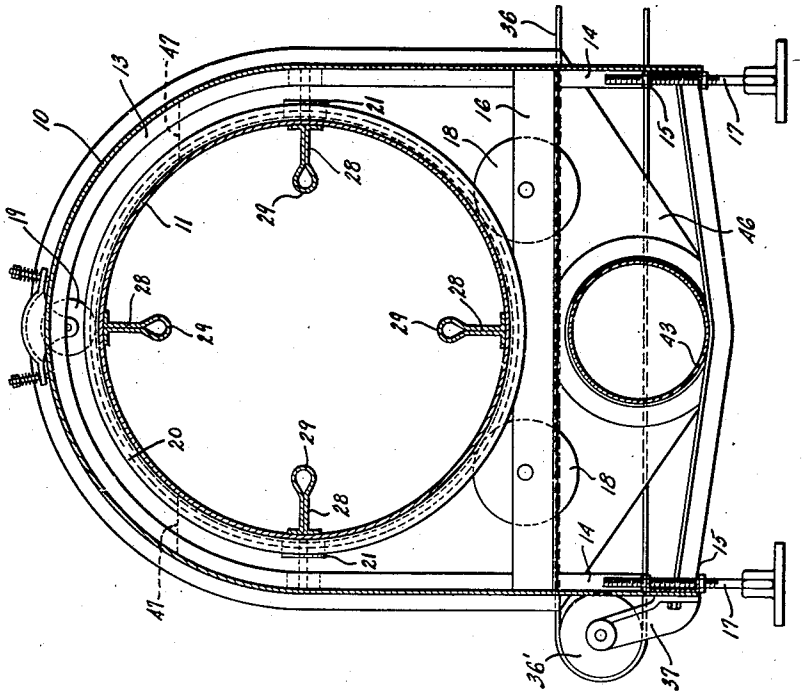


FIG. — 3

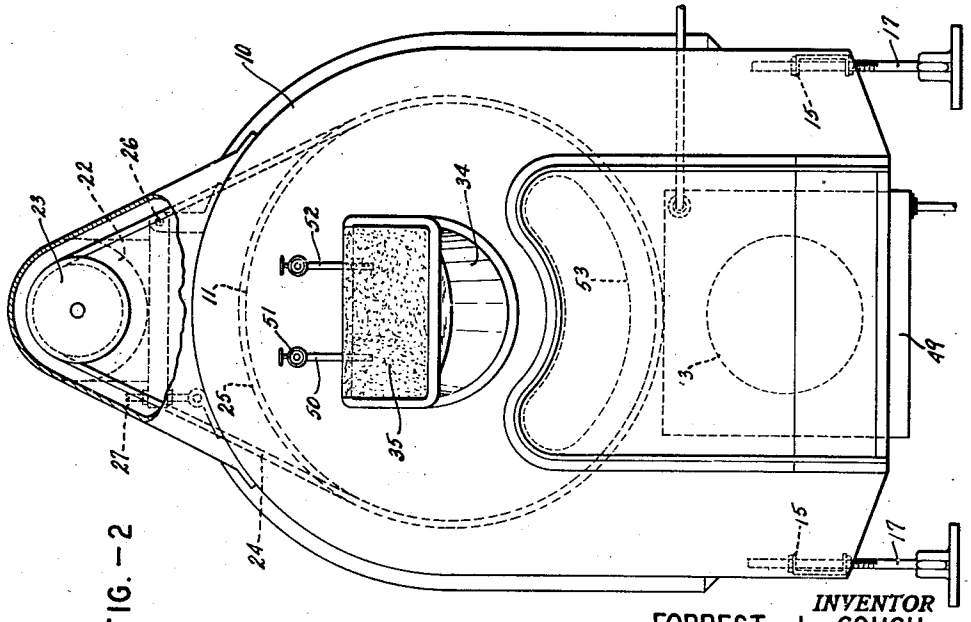


FIG. — 2

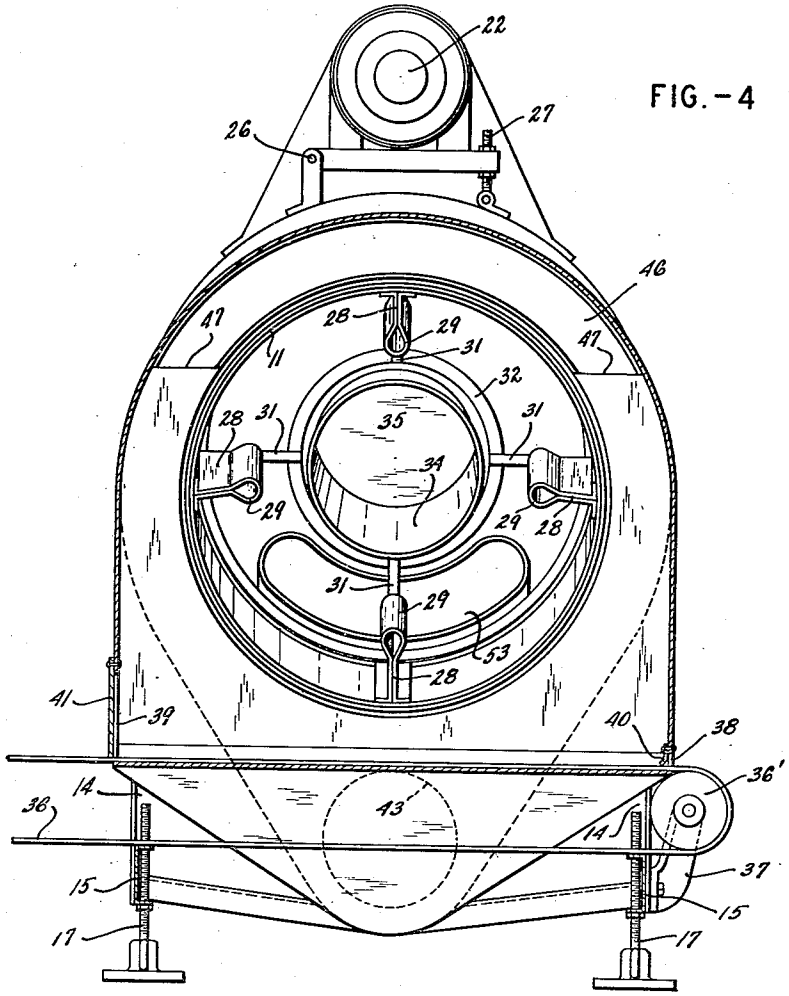
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FIG. - 4



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UNITED STATES PATENT OFFICE

2,079,280

CONTINUOUSLY CONDITIONING TUMBLER

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Original application June 12, 1933, Serial No. 675,417. Divided and this application April 3, 1935, Serial No. 14,398

1 Claim. (Cl. 34—5)

This invention relates to improvements in conditioning apparatus for use in laundering clothes and the like preparatory to their introduction into an ironing machine. In the regular laundering process, the excess moisture is removed from the laundry goods in an extractor which leaves the goods in a folded and wrinkled state and with the moisture therein very unevenly distributed. If these goods are merely shaken out, the creases or wrinkles will contain insufficient moisture for ironing, so that the finished article will contain marks, commonly called "crow's feet".

One of the purposes of this invention is to shake out the folds in the goods by passing them through a tumbling drum while at the same time equalizing the moisture content throughout the goods, particularly, to increase the moisture content where the goods were previously creased or wrinkled.

Another object of this invention is to raise the temperature of the goods passing through the tumbling drum, if desired.

Further objects include the increasing of the moisture content of the goods while passing through the conditioning apparatus, if necessary, and the addition of freshening gases or liquids to the atmosphere surrounding the goods in the tumbling drum, if desired.

Other objects and advantages will appear from the following description considered in connection with the drawings, and the essential features of which are summarized in the claim.

Fig. 1 is a longitudinal sectional view; Fig. 2 is an end view of the inlet end, partly broken away; Fig. 3 is a section taken on the line 3—3 of Fig. 1; while Fig. 4 is a section along the line 4—4 of Fig. 1.

The method is carried out by arranging a closed system for circulating a current of air through the goods while they are being shaken out preparatory to ironing, and recirculating the air continuously while retaining in the air current the moisture given off by the goods. This circulating air current is the medium by which are realized the further objects of adding heat to the goods, or adding moisture, or freshening ingredients other than moisture, when desired.

A description of my improved method and claims covering the same will be found in my copending application Ser. No. 675,417, filed June 12, 1933.

In general, the apparatus illustrated for practicing my improved method comprises a casing within which a tumbling drum is mounted for rotation. The laundry goods are introduced into one end of the drum and discharged at the other end. A current of air is passed through the drum and a duct is provided for returning the air to the entrance end of the drum for recirculation. Sprays are provided for adding moisture or freshening ingredients to the contents of the drum, and a heating element is suitably placed to heat the air passing through the duct, if desired. A continuous stream of goods is thus passed through the drum and the wrinkles and folds are shaken out, while the circulating air picks up excess moisture from the saturated portions of the goods and distributes it to the drier portions of the goods, for instance, the wrinkled parts. The clothes are then delivered for ironing with a homogeneous moisture content.

The casing 10 and the drum 11 are supported on a suitable framework, that shown comprising main frame members 12 and 13 comprising semicircular shaped channels with legs 14 at their lower ends, longitudinally extending bottom channel members 15, and transverse members 16. The drum preferably slopes downwardly toward the discharge end and adjustability is provided by threaded members 17 passing through the bottom channels.

The drum is mounted for rotation within the casing, the support illustrated comprising lower rollers 18, rotatably mounted on the transverse frame members and upper rollers 19, which are carried by the main frame members and spring-pressed downwardly to maintain contact between the drum and rollers 18. The drum may be provided on its outer periphery with circular flanged rings or channels 20 in which the rollers 18 and 19 are adapted to travel. For preventing longitudinal movement of the drum, other rollers 21 may be mounted on the main frame members and arranged to contact the flanges of the circular channels 20.

Power means is provided for rotating the drum, the embodiment comprising a motor 22 mounted on the main frame, a pulley 23 driven by the motor shaft, and a plurality of flexible endless belts 24, preferably V-shape in section, which pass about a suitably grooved band 25 on the drum. For taking up slack in the belts the motor may be adjustably mounted, as by pivoting one end of the motor base at 26 and securing the other end of the base on a threaded member 27.

The drum is provided with means for lifting or agitating the goods passing therethrough, that shown comprising longitudinally extending shelves or blades 28 secured to the inner periphery of the drum. These blades may be provided

with rounded enlargements 29 at their free ends the better to lift the clothes without tearing them. The blades may be cut away at the outlet end of the drum, as shown at 30 in Fig. 1, to facilitate the discharge of the clothes from the drum. The inlet end of the drum may be braced by a plurality of spokes 31 which may be arranged extending radially inwardly from the blades and secured together at their inner ends by a ring 32.

The clothes or other laundry goods may be continuously fed to the drum at the inlet end, as by a conveyor 33 discharging into a suitable hopper 34, which is mounted on the casing 10 and extends into the drum beyond the ring 32. A flexible curtain 35 is provided for closing the hopper opening against air circulation. For discharging the goods from the conditioning device, I have shown a conveyor 36 whose tail pulley 36' is rotatably mounted in brackets 37 carried by the longitudinal frame members 15. The conveyor enters and leaves the casing through suitable openings 38 and 39, which may be sealed against air passage by curtains 40 and 41. The opening 39 is made sufficiently large to permit clothes to pass outside of the casing on the conveyor. An extension 42 may be provided on the casing wall to prevent goods falling too near the edge of the conveyor.

For the circulation of air I provide a duct 43 leading from one end of the drum to the other. By placing this duct in the space beneath the drum I am able to construct a very compact device. Means is provided for circulating and recirculating air through the drum and duct. The means shown comprises a fan 44, driven by a motor 45, which is preferably arranged in an open-ended tube 54 extending transversely of the duct to protect the motor from the moist air. While the air current may travel in either direction, I prefer to have it pass through the drum from the goods inlet end to the outlet end as shown by arrows in Fig. 1.

The duct is connected with the casing at the discharge end of the drum preferably by means of a substantially circular duct 46 surrounding the outlet end of the drum, and open at its upper rear portion, as indicated at 47. This gives a better distribution of the air currents in the drum and places the suction inlet as far as possible from the clothes discharge opening in the casing. The duct leads from the lower portion of this circular duct 46 to the inlet end of the drum which it enters through a curved opening 53 in the lower part of the casing. The portions of the casing engaging the inlet and outlet ends of the drum are sealed by flexible strips 48, thus forming substantially airtight compartments at those points. The air circulation thus provided is a closed system so that moisture or other ingredients may be retained until evenly distributed through the clothes.

For the addition of heat to the circulating air current, I have illustrated a steam radiator 49 in the duct 43.

Moisture may be added to the circulating air current and to the goods in the tumbling drum by means of the pipe 50 with its regulating valve 51. By the use of a similar pipe or spray 52, gaseous or liquid freshening ingredients, such as ozone, may be introduced into the conditioning apparatus.

While I have not illustrated the same, it is obvious that moisture could be removed from the circulating air current by providing in the duct 43, between the fan and the outlet end of the drum, a discharge opening for the air current coming from the drum, and an opening to the atmosphere for the introduction of air to the fan. Such a change would make a drier out of my conditioning equipment.

It is thus apparent that I have devised a conditioner which is inexpensive to construct and maintain, and one which is simple to operate. Where laundry goods are continuously passing from an extractor operated in a uniform manner, little attention need be given to the conditioner. The temperature and moisture content of the clothes discharged from my device may be maintained sufficiently uniform by occasional slight adjustments of the apparatus described.

What I claim is:

Apparatus for continuously conditioning washed fabric articles between extracting and ironing comprising an imperforate cylindrical tumbling drum substantially open at the ends, a frame, means rotatably mounting said drum in said frame spaced above a supporting surface, means for continuously rotating said drum, a casing surrounding the top and sides of said drum along the entire length thereof, said casing having end portions extending beyond and completely surrounding each end of said drum, sealing means between said drum and said end portions of said casing, there being a sealed article inlet opening through one casing end portion, a belt conveyor forming a floor for the other end casing portion for delivery of articles therefrom, there being an article discharge opening in said delivery end casing portion over the exit run of said conveyor and a flexible swingable air-sealing curtain covering said opening, there being an air outlet passageway in said delivery end casing portion above said drum, closed conduit means leading from said passageway downwardly on opposite sides of said drum and within the confines of said casing, said conduit means then extending below said drum to the inlet end casing portion and there discharging into the lower part of said inlet end casing portion, and fan means for moving a current of air through said conduit means and drum and casing, whereby said conduit means and drum and casing form a closed air circulating system from the delivery end of said drum to the inlet end thereof and then through said drum to its delivery end.

FORREST J. COUCH.