

J. J. POWER.
LAUNDRY DRIER.
APPLICATION FILED DEC. 7, 1916.

1,338,696.

Patented May 4, 1920.
2 SHEETS—SHEET 1.

Fig. 1.

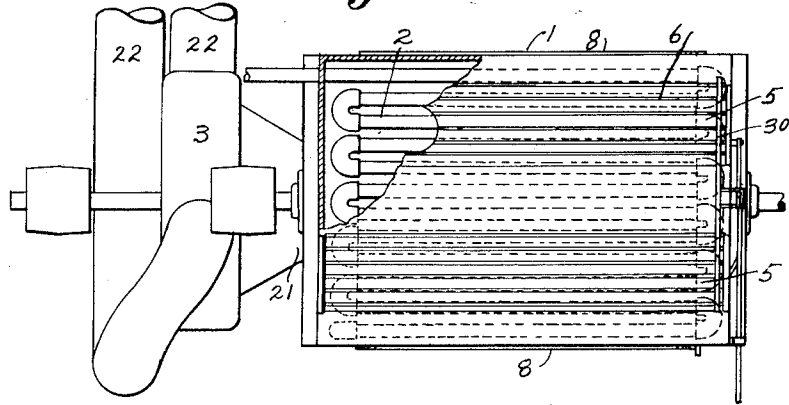
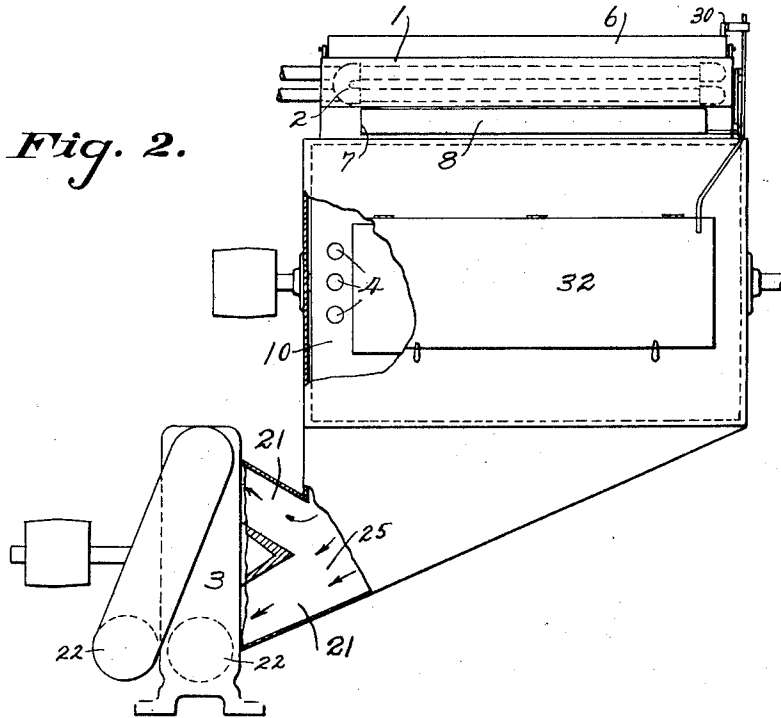


Fig. 2.



Inventor

Witnesses
John A. Holt
Frederick A. Holt

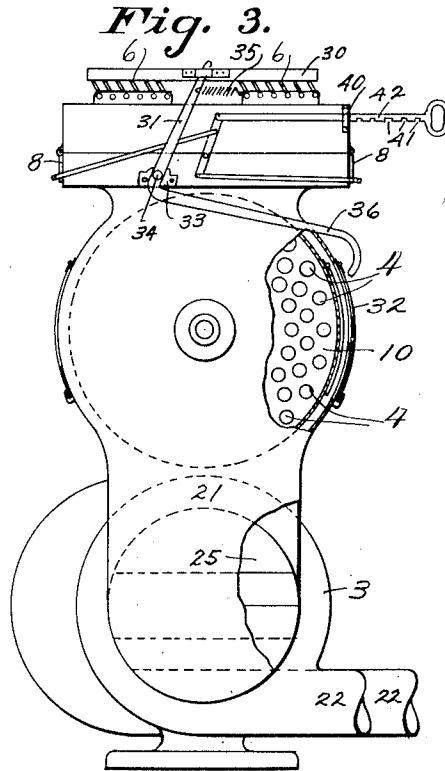
J. J. Power
By *Ernest Whaler*

Attorneys

J. J. POWER.
LAUNDRY DRIER.
APPLICATION FILED DEC. 7, 1916.

1,338,696.

Patented May 4, 1920.
2 SHEETS—SHEET 2.



Inventor

Witnesses
James J. Power
Fredrick H. Holtz

Jeffrey J. Power
By *Erwin & Wheeler*

Attorney

UNITED STATES PATENT OFFICE.

JEFFREY J. POWER, OF MADISON, WISCONSIN, ASSIGNOR TO POWER, STEVENS FAN
DEVICES COMPANY, OF MADISON, WISCONSIN, A CORPORATION OF WISCONSIN.

LAUNDRY-DRIER.

1,338,696.

Specification of Letters Patent.

Patented May 4, 1920.

Application filed December 7, 1916. Serial No. 135,538.

To all whom it may concern:

Be it known that I, JEFFREY J. POWER, citizen of the United States, residing at Madison, county of Dane, and State of Wisconsin, have invented new and useful Improvements in Laundry-Driers, of which the following is a specification.

My invention relates to improvements in laundry driers.

Heretofore the common practice has been to place the fabrics to be dried in a rotary drum having perforate or slotted sides and then draw heated air through the drum by suction, the drum being arranged to substantially fill a closed chamber the side and end walls of which are air tight. The air is ordinarily heated by a set of steam coils over which the air passes on its way to the drum. But such systems as heretofore constructed, have proven expensive and unsatisfactory and dangerous in operation for the following reasons.

If highly heated air is drawn rapidly through fabrics which have been cleaned by gasoline or which contain hydro-carbons, spontaneous combustion is almost certain to develop. Also the expense of heating the air is great, and the air when heated is expanded and it is therefore difficult and even impossible under some conditions to efficiently discharge it into the surrounding atmosphere by means of an ordinary fan.

Owing to the difficulty of delivering the heated air to exterior points against the pressure of the colder, denser, and therefore heavier air of the surrounding atmosphere, and also owing to the heavy expense of heating the air, it has heretofore been common to provide closed air circulating systems in which the same air is repeatedly used, a fan being employed simply to draw the air through the clothes and return it to the heating coils. But in such cases the air quickly becomes saturated with moisture and as condensation is very slight with the comparatively slight reduction in temperature at the fan side of the system, the drying process becomes very slow after the air has been once saturated. Its capacity to absorb additional moisture is then due wholly to the additional heat imparted to it immediately prior to its delivery through the fabrics to be dried.

The object of my invention is to overcome the difficulties above mentioned and

provide a drier in which the temperature of the air passed through the fabrics may be controlled to suit the conditions of any given drying operation, the air not being unnecessarily heated, and in any case being compressed or densified preparatory to its delivery into the surrounding atmosphere, whereby it may be delivered by a fan without difficulty and without expenditure of power, even though the delivery be made at a point exterior to the building and into cold air.

In the drawings—

Figure 1 is a plan view of a laundry drier embodying my invention with the casing partly broken away to show the heating coils.

Fig. 2 is a view of the same in front elevation with the front wall of the casing broken away to show the fabric holding drum.

Fig. 3 is an end elevation also broken away to show the drum.

Like parts are identified by the same reference characters throughout the several views.

The upper portion of the casing 1 is provided with a set of heating coils 2 over which the air may be drawn by suction exerted by a fan 3 of peculiar type which compresses the air to some extent as hereinafter explained. Air is admitted through apertures 5 in the top wall of casing 1 which apertures may be wholly or partially closed by hinged shutter valves 6. Air may also be admitted to the interior of casing 1 through apertures 7 which may also be wholly or partially closed by hinged shutters or doors 8. The air thus admitted is received in the space below the heating coils 2 and above a rotary drum 10 in which the fabrics to be dried are placed. This drum has skeleton, or perforated walls, such, for example, as the end walls of the drum 10, which are shown provided with apertures 4, through which the air may freely pass. The structure of the drum is not material, if its walls permit free passage of air in such a manner as to allow the air to reach all parts of the fabrics within the drum while such air is passing to the space below the drum. The drum should also be so formed as to substantially fill the space between the walls of the casing to such an extent that the air must pass through the

fabrics to reach the lower portion of the casing. The drum receiving portion of the casing has cylindrically curved front and rear wall portions to which the drum is closely fitted. The drum should rotate in order to stir up the fabrics, without tearing them and allow the air to reach all portions thereof.

The air is circulated by an air compressing fan 3 preferably of the type shown and described in former patents, Reissue No. 12655 dated May 21, 1907, and No. 1,033,929 dated July 30, 1912, respectively, although I preferably provide two outlets, as shown. In such a fan, the casing and rotary member are similar to common types in commercial use, but the inlets are located at one side of the axial center of the fan *i. e.*, above and below the axial center, as shown in Fig. 2 and a cyclonic whirl is set up in the feeding pipes or ducts 21 which increases in intensity as it approaches the fan casing aperture, and this cyclonic whirl not only increases the efficiency of the fan for air delivery but it also effects a certain degree of compression due to the centripetal force of the whirling current; the tendency of the air current to whirl or rotate is not entirely broken up by the action of the fan wings, but persists to some extent in the air delivered through the discharge pipes 22, two of which are illustrated in Fig. 2, whereby, instead of being lighter, due to the application of heat, the air is in fact denser and heavier, and owing to its gyratory motion, it forces its way into the surrounding atmosphere with great facility. I am therefore enabled to withdraw hot moist air from the drying chamber and eject it through the pipes 22 to the exterior of the laundry building even though the exterior atmosphere be cold and heavy. The air from the drum 10 passes downwardly in the cavity 25 at the bottom of the drier casing and thence to the fan casing, located at one end of this cavity. The cyclonic whirl is initially developed in this cavity 25.

By providing means for admitting any desired proportion of the air to the drying chamber at points above the heating coils, or at such points and under conditions that the air must pass over the heating coils to reach the fabric holding drum and by controlling the admission of the remainder at points between the coils and said drum, I am enabled to cut off the heat to any desired extent and to use quite a large quantity of unheated air from the exterior, since such air is seldom saturated, and is usually capable of absorbing a great deal of additional moisture when drawn rapidly through wet fabrics.

I may also cut off the heat almost entirely when drying clothes that have been cleaned with gasoline, alcohol, or other in-

flammable material. The coils are usually filled with steam and some heat will, of course, radiate therefrom, into the air below, but not to a sufficient extent to materially affect the temperature when the machine is in operation with the shutters 6 closed. Ordinarily, however, the shutters 6 will be fully open when the machine is in operation, and the temperature regulated by the shutters or doors 8. To prevent injurious results and waste of heat due to careless management, I preferably connect shutters 6 by a rod 30 which is pivoted to each, and employing a rod actuating lever 31 which is automatically operated to close the shutters 6 when the door 32 is opened to remove and replace fabrics. In the construction illustrated, lever 31 is pivoted to casing bracket 33 at 34 and normally held by a spring 35 in position with the shutters open. Lever 31 is provided with a curved operating arm 36 at its lower end which projects into the path of the door 32 in such a position that when said door is swung upwardly to its open position, this arm 36 will be pushed outwardly and the shutters closed. When the door is closed, the spring 35 automatically actuates the lever to shutter opening position.

The shutters or doors 8 may be connected by an operating bar 42 which may be manually adjusted and held in any desired position by a detent 40 which may engage in any one of a series of notches 41 in the bar 42.

I claim—

1. A laundry drier, including the combination with a casing provided with manually controlled means for admitting air, and also having an exhaust opening on the opposite side of the central portion of the casing from the inlet side, means for heating the air at the inlet portion of the casing, a container for fabrics interposed between the heating means and the casing outlet, said container having openings adapted to permit the air to circulate therethrough, and manually controlled auxiliary means for admitting air to the casing between the heating means and the container.

2. A laundry drier, including the combination with a casing provided with manually controlled means for admitting air, and also having an exhaust opening on the opposite side of the central portion of the casing from the inlet side, means for heating the air at the inlet portion of the casing, a container for fabrics interposed between the heating means and the casing outlet, said container having openings adapted to permit the air to circulate therethrough, and manually controlled auxiliary means for admitting air to the casing between the heating means and the container, said air withdrawing means being adapted to com-

press the moisture laden air and eject it in a compressed condition.

3. A laundry drier, including the combination with a casing provided with manually controlled means for admitting air, and also having an exhaust opening on the opposite side of the central portion of the casing from the inlet side, means for heating the air at the inlet portion of the casing, a container for fabrics interposed between the heating means and the casing outlet, said container having openings adapted to permit the air to circulate therethrough, and manually controlled auxiliary means for admitting air to the casing between the heating means and the container, said air withdrawing means comprising a rotary fan having an eccentrically located suction inlet and adapted by suction exerted at its inlet to set the moisture laden air in rotation and simultaneously develop centripetal force to compress the same preparatory to the ejecting action of the fan blades thereon.

4. A laundry drier including the combination with a casing of a container for fabrics rotatably mounted within the casing, said container being cylindrical in form and said casing having curved walls conforming to the curvature of the container, on opposite sides thereof, means for admitting air to the casing, heating means interposed between the container and the portion of the casing through which said air is admitted, means for admitting additional air between the heating means and the container, and air exhausting means on the other side of the container from that at which the air admitting and heating means are located.

5. A laundry drier, including the combination with a casing provided with a valved

air inlet in one wall, and also having an air outlet at the opposite side of the casing, a container for fabrics rotatably mounted within the casing, and having perforate walls adapted to permit the air to circulate therethrough, a heater located between the air inlet and the container, and means for compressing the air on the opposite side of the container from that at which the air is admitted, and discharging it from the casing.

6. The combination set forth in claim 5, in which the compressing means is located exterior to the casing, and is adapted to compress the air therein by developing cyclonic currents in the vicinity of the outlet.

7. A laundry drier including the combination with a casing provided with main inlet ports and also having an outlet and a container for fabrics within the casing interposed between said inlet and outlet ports, air heating means interposed between the container and said inlet ports, adjustable shutters controlling the flow of air through said inlet ports and manually controlled means for admitting air to the casing between the heating means and said container, a door connected with the casing and affording access to said container, means adapted to be actuated by said door, when opened, for closing the said main inlet shutters, and means for automatically opening said shutters when said door is closed.

In testimony whereof I affix my signature in the presence of two witnesses.

JEFFREY J. POWER.

Witnesses:

LE ROY W. STURCY,
LEVERETT C. WHEELER.