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1,438,129.

Fig. 2.

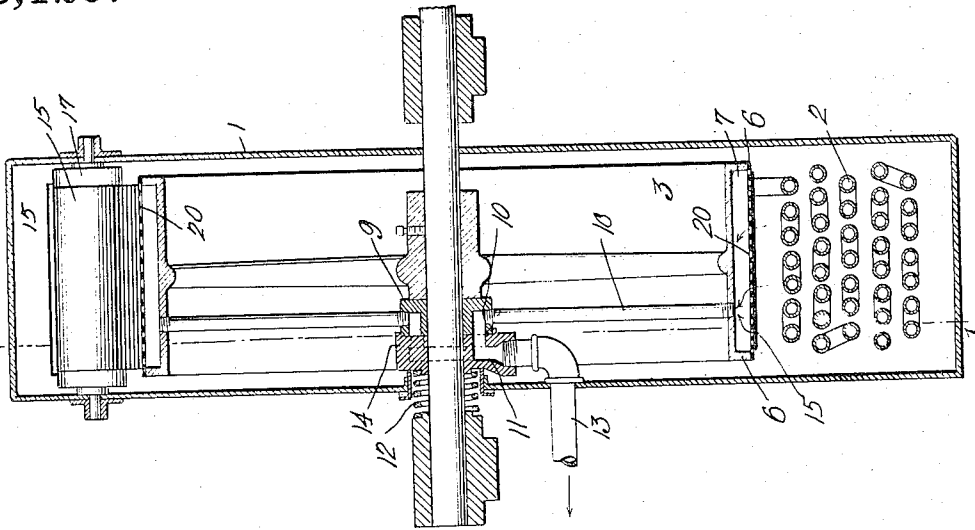
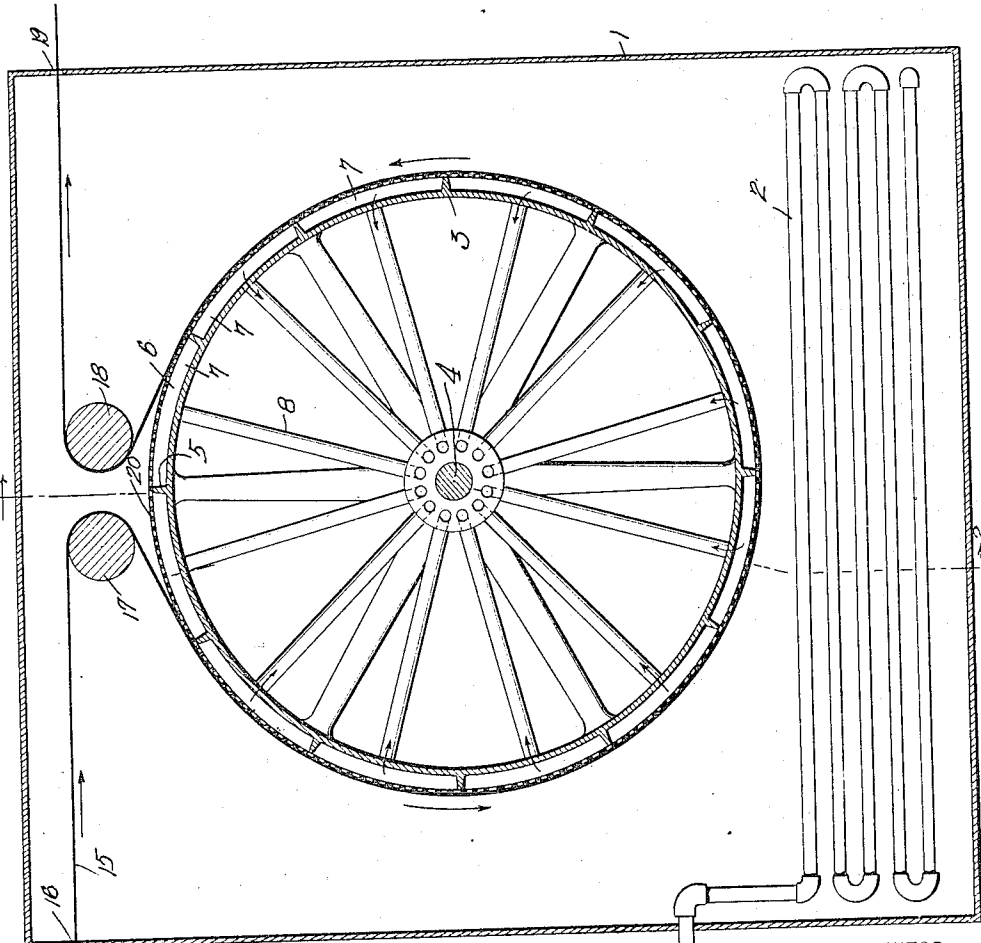
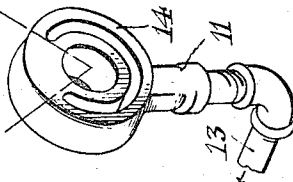


Fig. 1.



WITNESSES
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Fig. 3.



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DRIER.

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To all whom it may concern:

Be it known that I, LESTER E. MILKEY, a citizen of the United States, and a resident of Sandusky, in the county of Erie and State of Ohio, have invented a new and Improved Drier, of which the following is a full, clear, and exact description.

This invention relates to improvements in driers, and more particularly to an improved paper or fabric drier employing a drying vacuum system in which the sheet or fabric is maintained out of contact with any hot metal surface.

A further object is to provide a drier in which heated air is sucked through the sheet during its movement on the periphery of a suction drum and while it is confined in a casing so that a relatively long length of the sheet is subjected to the vacuum process and the moisture therefrom is removed without scorching or in any way injuring the fibres of the sheet.

A further object is to provide a drier which performs its function uniformly throughout the sheet and which occupies but a relatively small space in use.

With these and other objects in view the invention consists in certain novel features of construction, and combinations and arrangements of parts as will be more fully hereinafter described and pointed out in the claims.

In the accompanying drawings—

Figure 1 is a view in longitudinal section illustrating my improved drier.

Figure 2 is a view in transverse section on the line 2—2 of Figure 1.

Figure 3 is a perspective of a valve ring embodied in the invention.

1 represents a casing having a steam coil 2 in its lower portion to heat the air in the interior of the casing to the desired temperature. 3 represents my improved drier or drum which is fixed to a shaft 4 extending through the drum and is provided on its periphery with transverse webs 5 and peripheral flanges 6 forming a circular series of air chambers 7 around the periphery of the drum. Each of these air chambers is connected by a radial pipe 8 with a hub member or ring 9 on the shaft 4, said ring having ports 10 therein adapted to communicate with a valve ring 11 loose on the shaft 4 and held in tight engagement with the hub member or ring 9 by means of a coil spring 12.

An air suction pipe 13 communicates with the valve ring 11 so that a suction of air is exerted through the valve ring 11 and through the pipes or ports 10 which are in open communication therewith. The upper portion of the valve ring 11 has a closed seat or face 14 which cuts off the ports 10 in the upper portion of the drum so that while suction is had through most of the chambers 7, those chambers 7 at the extreme upper portion of the drum are cut off.

15 represents a sheet of paper or other material to be dried, which enters the casing 1 through an inlet 16, thence passes around a roller 17 at the upper portion of the casing, thence around the periphery of the drum 3, thence around a roller 18 at the upper portion of the casing 1 adjacent roller 17 and escapes through an outlet 19 in the casing wall.

To present a cylindrical or smooth surface to the paper as it contacts with the drum 3, I provide a perforated cover 20 which extends entirely around the drum and forms a perforated outer wall for each and every one of the chambers 7 so that the air which is sucked from the chamber 7 is drawn through the perforated cover 20 and the sheet of paper 15 around the same.

It is, of course, obvious that this circular series of suction chambers around the periphery of the drum might be otherwise formed and the suction may be controlled in various ways, but in any event it is my purpose to provide a drum which has rotary mounting in a chamber containing some air heating means or into which hot air is supplied so that this hot air is sucked through the annular series of chambers in the periphery of the drum to dry the sheet and hence, the moisture is removed from the sheet without bringing the same into contact with any hot metal surfaces.

Furthermore, it will be noted that the greater portion of the periphery of the drum is utilized at all times so that an extended length of sheet is subjected to the vacuum or suction operation and any given point on the sheet has a relatively long travel under suction before it passes off of the drum.

It is, of course, obvious that only porous papers, such as filter mass, blotting paper, roofing paper and saturating papers and other similar porous materials, textiles, etc., can be dried using my improved apparatus

because it is necessary that the air be drawn through the sheet.

I believe that with my improved apparatus there is an economy of fuel, a rapidity of action, and a perfection of result which is vastly superior over devices for similar purpose in general use, and while I refer to the use of hot air, it is obvious that dry air or any other gaseous agent which can be brought to the desired dryness and temperature could be used as a medium for the suction through the paper or fabric for drying the same and I do not wish to be limited to the particular details of construction set forth, but consider myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of the appended claims.

I claim:

1. A drier comprising a drum having perforated chambers, pipes communicating with said chambers, a hub member connected to said pipes, a shaft rotatably supporting said hub member, and a ring valve mounted on said shaft and having a port communicating with said hub member.
2. A drier comprising a drum having a plurality of chambers and a perforated rim forming the outer walls of said chambers, radially arranged pipes in communication with said chambers, a valve arranged at the central portion of said drum and having communication with said pipes, an air current conveying pipe connected to said valve, and a heater arranged adjacent said drum.
3. A drier comprising a drum having a

plurality of chambers and a perforated rim forming the outer walls of said chambers, radially arranged pipes in communication with said chambers, a valve arranged at the central portion of said drum and having communication with said pipes, an air current conveying pipe connected to said valve, a heater arranged adjacent said drum, and a casing enclosing said heater and said drum.

4. A drier of the character described, comprising a casing, a heater in the lower portion of the casing, a drum having rotary mounting in the upper portion of the casing, said drum having a circular series of peripheral suction chambers, a perforated cover for said chambers, means for supporting a sheet against the cover, a series of radial pipes communicating with the respective suction chambers, a suction pipe, and means connecting the suction pipe with certain of said radial pipes whereby suction is had in the chambers only which are covered by the sheet to be dried.

5. A drier comprising a drum having perforated chambers, pipes communicating with said chambers, a hub member connected to said pipes, a shaft rotatably supporting said hub member, a ring valve mounted on said shaft and having a port communicating with said hub member, and a spring urging said valve into contact with said hub member whereby to form an airtight connection between the ring valve and the hub member.

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