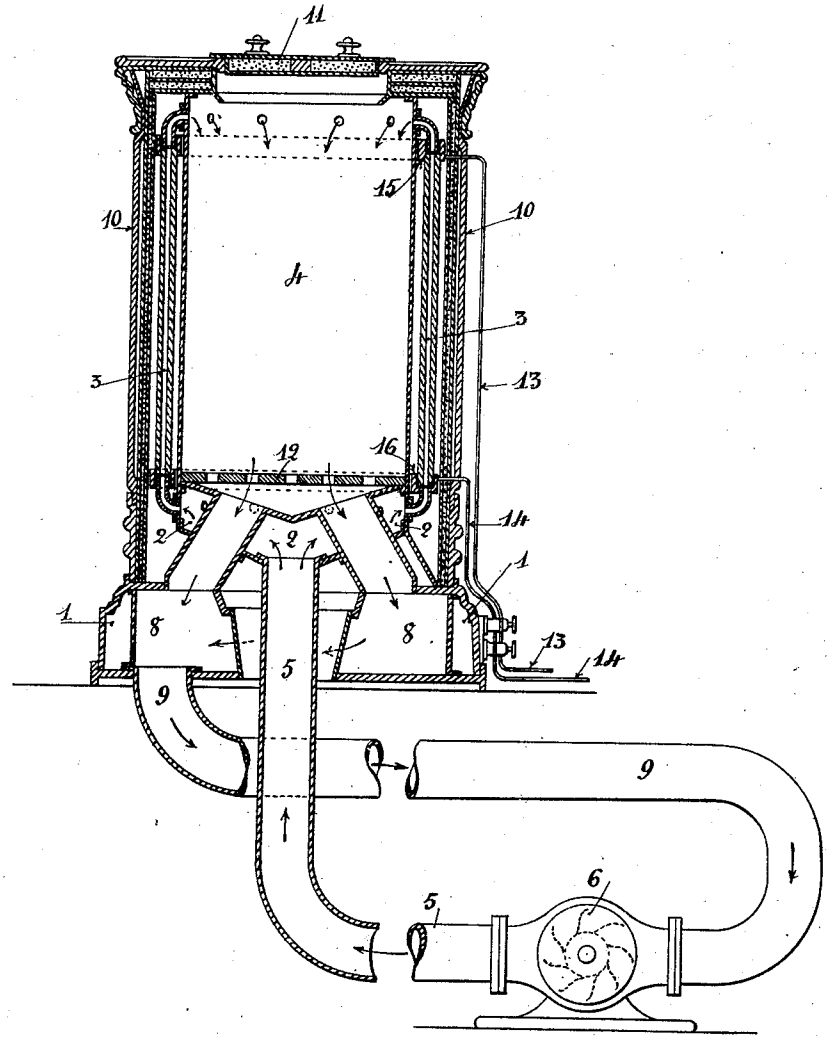
No. 652,867. Patented July 3, 1900.

J. M. J. E. VIGNON-DANTO.

ELECTRICAL DRYING APPARATUS.

(Application filed Apr. 15, 1899.)

(No Model.)



Witnesses
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UNITED STATES PATENT OFFICE.

JEAN MARIE JOSEPH EUGÈNE VIGNON-DANTO, OF LYONS, FRANCE.

ELECTRICAL DRYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 652,867, dated July 3, 1900.

Application filed April 15, 1899. Serial No. 713,203. (No model.)

To all whom it may concern:

Be it known that I, JEAN MARIE JOSEPH EUGÈNE VIGNON-DANTO, a citizen of the French Republic, residing at Lyons, France, have invented certain new and useful Improvements in Electrical Drying Apparatus for Treating Textile Fabrics, of which the following is a full, clear, and exact description.

In the drying apparatus which forms the subject of the present invention the heat necessary for heating and maintaining at the requisite temperature the air used for drying the textile fabrics treated for the purpose of "conditioning" them is obtained by means of electric energy transferred to caloric, and the arrangement for so utilizing electric energy is entirely contained in the drying apparatus itself. By this means all the foundation and work necessitated by the ordinary kind of heating apparatus is avoided, as well as the fires, which are so troublesome and difficult to regulate.

In the accompanying drawing, which is in illustration of my invention, the improved drying apparatus is shown partly in vertical section.

Upon a foundation or base 1 is arranged a box or chamber 2, the top and bottom of which are formed of two cores, the upper ends of which are pointed in the same direction. The circumference of the box thus formed is pierced with holes, against which fit tubes 3, which connect the box 2 with the upper part of the drying-chamber 4, which rests directly upon the box 2. These tubes are composed of a material presenting a determined resistance to the passage of an electric current. They may be made, for example, of a mixture of carbon and clay in proportions varying according to the degree of temperature to which it is required that the tubes should be raised by the passage of an electric current of given tension and intensity.

The bottom of the chamber 2 is connected by a tube 5 with the delivery-openings of a fan 6, while the bottom of the chamber 4 is connected by passages 7, traversing the box 2, with a box 8, inclosed in the base 1, and from which a pipe 9 communicates with the inlet of the fan 6.

The drying-chamber 4, as well as the tubes 3, are inclosed in a casing of non-conducting material to prevent the radiation of heat from their exterior. The chamber is provided with a perforated bottom 12, upon which the textile materials to be treated are placed, being introduced through an opening at the top of the apparatus, upon which a cover 11 can be fitted.

13 and 14 indicate wires which respectively connect with the tubes and lead off to a suitable source of electricity for supplying the current necessary for the heating of the tubes.

The action of the apparatus is as follows: After having introduced the textile materials which are to be treated into the chamber 4 and closed the latter the fan 6 is set in action, and at the same time a current of electricity generated in any suitable way is passed through the tubes 3. By the passage of the current the temperature of these tubes is raised, as well as that of the air which circulates through them. The heated air enters the upper part of the chamber 4 and becomes charged with the vapor of the water contained in the textile materials as it passes down through the chamber.

It will be seen that in the form of the apparatus shown in the drawing the air which is used for the desiccation passes through a cycle of operations. In the tubes 3 it is raised to a temperature of, say, t'. It then takes up the moisture in the chamber 4, where its temperature becomes lowered from t' to t^2. The air is then sent back to the tubes 3, where its temperature is again raised from t^2 to t'. The vapor of water which it may contain is then reduced in tension and escapes through the cover. It is therefore always the same volume of air which is used during the process, while in ordinary drying apparatus the hot air which has passed over the textile material is discharged into the atmosphere at a temperature of t^2, and fresh air at a temperature of t^0 is constantly being introduced into the apparatus. At each operation, therefore, the caloric necessary to bring the temperature of the total volume of air which would pass through the tubes 3 during an operation from a temperature t^0 to that t' is saved.

The work done by the apparatus is independent of the degree of moisture in the exterior atmosphere.

The expenditure of "calories" necessary

for each operation is that necessary, first, to furnish the latent heat of vaporization while the drying is going on; second, to raise the fresh supply of cold air which is admitted through the cover at the end of the operation or which leaks through imperfect joints from a temperature of t^0 to t'; third, to compensate for the loss of caloric due to radiation from the walls of the apparatus.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. The combination with a drying-chamber of tubes arranged around the drying-chamber and constructed of material such as described, means for causing an electrical current to heat the said inclosing tubes and means adapted to cause air to continuously circulate through the tubes and into and through the drying-chamber.

2. The combination with a drying-chamber, having a perforated bottom and air-inlet openings at the opposite end, of a draft-fan, a box below the bottom of the chamber, a pipe leading from the box and in communication with the fan, tubes arranged around the drying-chamber and in communication with the box and the air-inlet openings of the drying-chamber, and a tube leading from the fan and in communication with the perforated bottom of the drying-chamber.

3. The combination with a drying-chamber, of tubes surrounding said chamber and constructed of material such as described, means for causing an electrical current to heat the said inclosing tubes, and means adapted to cause air to continuously circulate through the tubes and into and through the drying-chamber, and a casing of heat non-conducting material surrounding the tubes.

4. The combination with a drying-chamber having a perforated bottom and air-inlet openings at the opposite end, of tubes surrounding said chamber and constructed of material such as described, means for causing an electrical current to heat the inclosing tubes, a draft-fan and connections between the latter and the perforated bottom and the air-inlet openings of the drying-chamber whereby the fan is adapted to produce a continuous circulation of air through the tubes and into and through the drying-chamber.

In testimony that I claim the foregoing I have hereunto set my hand this 1st day of April, 1899.

JEAN MARIE JOSEPH EUGÈNE VIGNON-DANTO.

Witnesses:

JOS. PATROUTTIER,

J. M. RICHARDS.