

(No Model.)

J. H. LORIMER.
DRYING APPARATUS.

No. 354,797.

Patented Dec. 21, 1886.

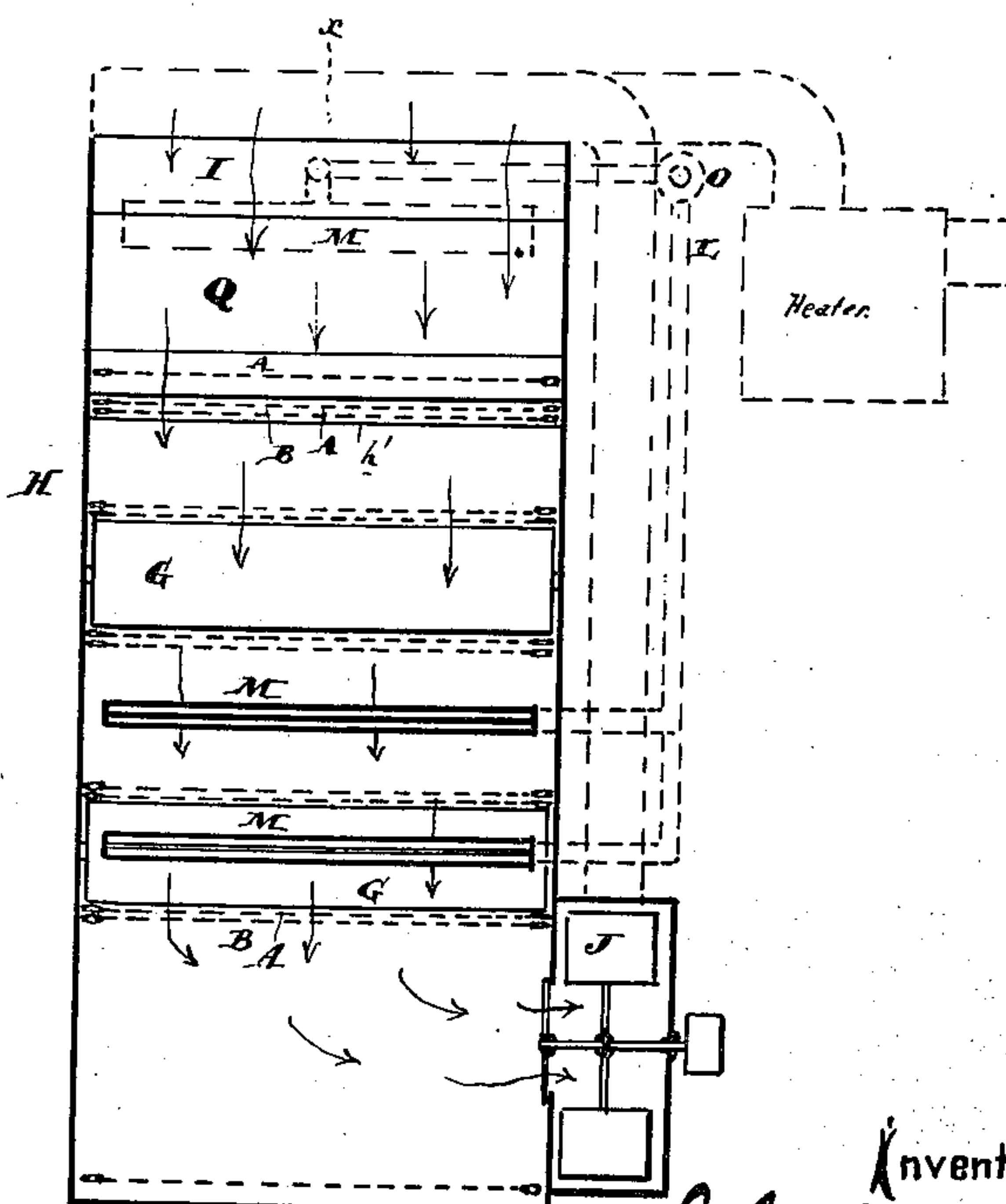
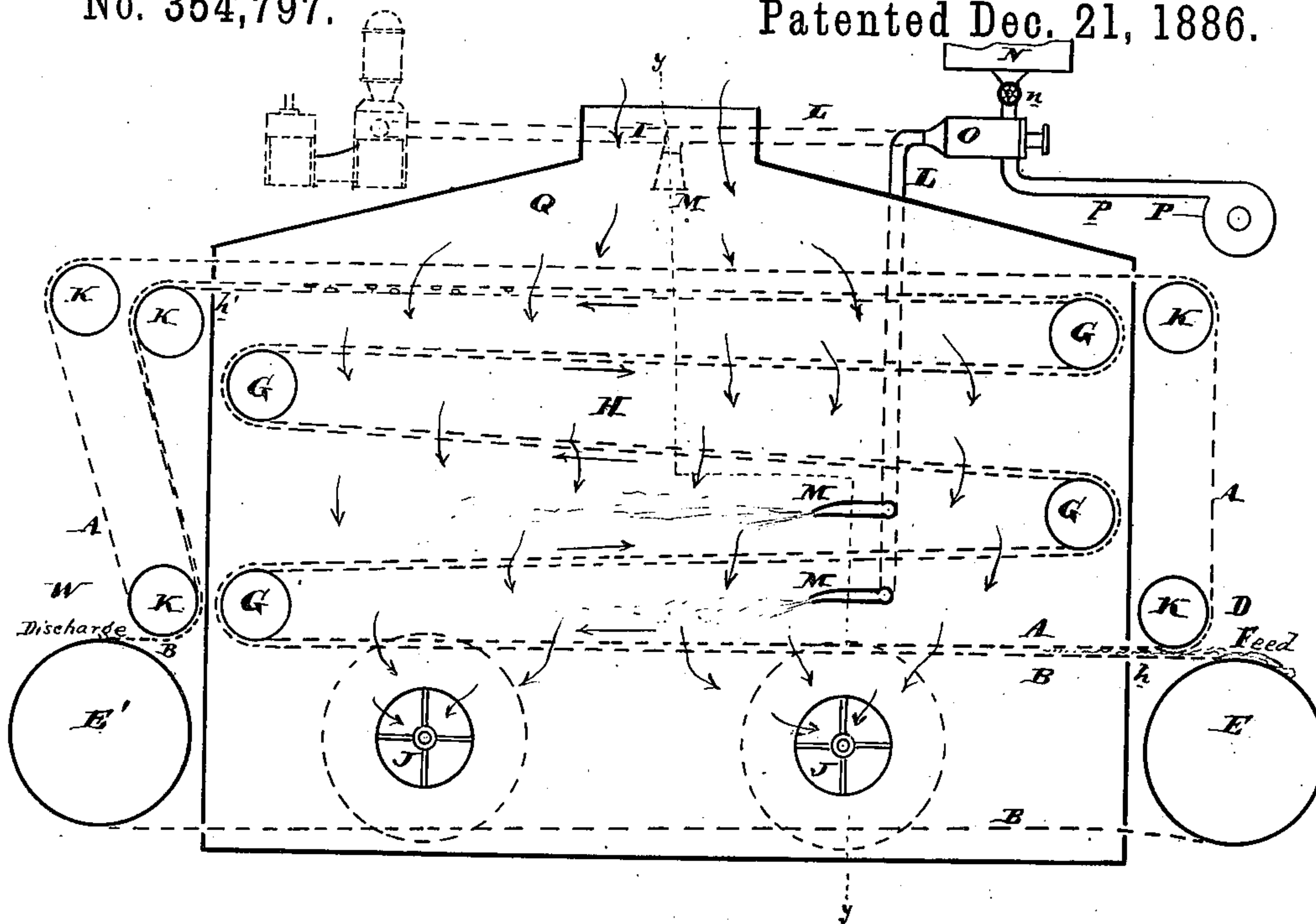


FIG.2

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UNITED STATES PATENT OFFICE.

JOHN H. LORIMER, OF PHILADELPHIA, PENNSYLVANIA.

DRYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 354,797, dated December 21, 1886.

Application filed March 26, 1886. Serial No. 196,642. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. LORIMER, of the city and county of Philadelphia and State of Pennsylvania, have invented an Improvement in Drying Apparatus, of which the following is a specification.

My invention has reference to an improved apparatus for treating textile fibers or materials—such as rags, paper-pulp, wool, cotton, yarn, &c.; and it consists in certain improvements, all of which are fully set forth in the following specification, and shown in the accompanying drawings, which form part thereof.

In Letters Patent granted to me March 2, 1886, No. 336,928, is described an improved drying-machine for drying wool, cotton, yarns, &c., by causing them to pass back and forth through a chamber by means of endless aprons, through which chamber and material to be dried currents of air or drying media are caused to pass. In this application my object is to combine the principles involved in the said machine with suitable means for atomizing or spraying wet colors or disinfectants or other liquid with which the material is to be treated, and causing it or disinfectant, bleaching, or coloring gases to be drawn in with the passing drying air or gas and made to act upon the material which is being conveyed back and forth through the chamber. If the supply of color or disinfecting media be uniform, every portion of the yarn, wool, cotton, &c., will be treated therewith to the same degree, and after being treated with said sprayed material it will be dried before emerging from the machine. By this method materials may be bleached, disinfected, dyed, or colored in a speedy and convenient manner, reducing the cost and labor necessary to accomplish the desired result.

The machine could be used to advantage where delicate tinting was required, as the coloring-matter, being held in suspension by the passing air, will permeate every portion of the material being carried through the machine.

In the drawings, Figure 1 is a sectional elevation of a machine embodying my improvements on line *x x*, and Fig. 2 is a cross-section of same on line *y y*.

A B are two endless aprons, between which the wool or cotton, &c., to be dried is held and conveyed through the drier or hot-air chamber, and may be formed of link-chains with slats between; or webbing, netting, or combinations of any two or more of these may be used, the particular construction of these endless conveyers or aprons being immaterial to my invention. These aprons A B lie close upon each other in passing through the heating or drying chamber H and while passing around and over the guide-rollers G G, moving back and forth or up and down through said chamber for the purpose of being retained therein as long a time as necessary. The apron A is guided outside the chamber H by rollers K, and apron B by rollers E E'.

D is the feeding end, and may be of any suitable construction, and the yarn, wool, or cotton to be dried after being fed upon the apron B is carried up over rollers F and between it and the apron A, which passes around roller K and enters the drying-chamber H through opening *h*, and while held between the aprons (and, if desired, prevented from displacement by slats C thereon) is conveyed over rollers G G, and, after passing back and forth a number of times emerges by apertures *h'* to the outside of the chamber, and the material from between the said aprons is discharged at W. The traveling aprons may be made in any manner desired, but should be of open netting or webbing secured to chains on its lateral edges, and may be furnished with slats, which would be preferably on the top of the net-work or next to the cotton, wool, yarn, &c., to be dried, so as to prevent the same from being displaced on turning over the drums or pulleys in transit through the heating apparatus. The netting may be formed of cord or twine or their equivalent, and, if desired, the slats may have teeth or projections to more securely hold the material to be dried from displacement. The cotton, wool, &c., or yarn in skein or warp, may be delivered to the endless aprons and conveyed through the drying-chamber. This drying-chamber H may be simply a large chamber, into or through which hot air or gas is forced or drawn by one or more blowers or fans, J, or by any other means, the ingress or

egress of air being allowed by the openings, as at the top or bottom, for instance, as at I.

When the air-currents and aprons pass in the same direction through chamber H, the upper part of the chamber may be made conical or dome shape, as at Q, and projecting into the opening is a pipe, L, terminating in a rose or spraying-nozzle, M, as indicated in dotted lines.

O is an injector or device for forcing the disinfectant or coloring medium or liquid through pipe L, the liquid being supplied from a tank, N, and its flow controlled by a valve, n.

P is a blower connecting by a pipe, p, with the injector O, whereby a forced current of air may be used to propel and subdivide or spray the disinfectant or coloring fluid. In place of a fan the fluid may be sprayed by the use of a jet of steam, in which case the pipe p would connect with the boiler; or, if desired, the fluid could be pumped through the nozzle M and sprayed under great pressure, as indicated in dotted lines. Fig. 1, the particular method or apparatus used for spraying the fluid being immaterial to my invention.

When the air-currents and aprons pass in opposite directions, the disinfectant or bleaching or coloring matter is preferably sprayed into the chamber between the aprons at one or more places near where they enter, as indicated by solid lines at M, preferably so as to act upon both sides of the material to be treated.

Any form of disinfecting gas or fluid might be used—as, for instance, Burnett's or Condy's—and the coloring matter, if desired, may be mixed with the disinfectant or may be used separately. The disinfectant may be supplied from one set of pipes, and the coloring-solution from another set of pipes, both being fed simultaneously to the air-currents passing through the machine; or, if desired, either one may be used without the other. The air used as a drying medium may, if desired, be heated before passing through the machine by being caused to pass over the hot surfaces, as indicated in Fig. 2, dotted lines.

This apparatus is equally applicable for impregnating the materials conveyed through it with any other substances in the liquid or gaseous state.

In this application I do not claim the pro-

cess, as that forms subject-matter of another application of mine, bearing even date with this, and serial numbered 196,643.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A close drying-chamber through which a drying medium is caused to circulate, in combination with two endless aprons adapted to lie close together to hold the material to be dried, and arranged to pass back and forth within the drying-chamber, the aprons being brought outside the chamber at two places, one to form the feeding and one to form the discharging parts thereof, whereby the goods to be dried may be placed upon the aprons and then conveyed through the drying-chamber, and after being dried discharged again, guiding-rollers for the aprons, and suitable devices for injecting into said drying medium a fluid or gas which is conveyed to the material to be dried and caused to act thereon, the drying medium being the vehicle by which the fluid or gas is brought into contact with the material to be treated and dried, substantially as and for the purpose specified.

2. The combination of the inclosed drying-chamber having openings for the admission of the endless belts, and provided with openings, with a fan or blower to cause a circulation of air through said drying-chamber, the two endless belts or aprons, guiding rollers therefor to guide said aprons back and forth in said drying-chamber and in the path of the air-currents, and convey the said aprons outside or exterior to the closed chamber at two places for the feed and discharge, and suitable devices for injecting into said drying medium a fluid or gas, which is conveyed to and through the material to be dried and caused to act thereon, the drying medium being the vehicle by which the fluid is brought into contact with the material to be treated and dried, substantially as and the purpose specified.

In testimony of which invention I hereunto set my hand.

JOHN H. LORIMER.

Witnesses:

R. M. HUNTER,
RICH'D. S. CHILD, Jr.