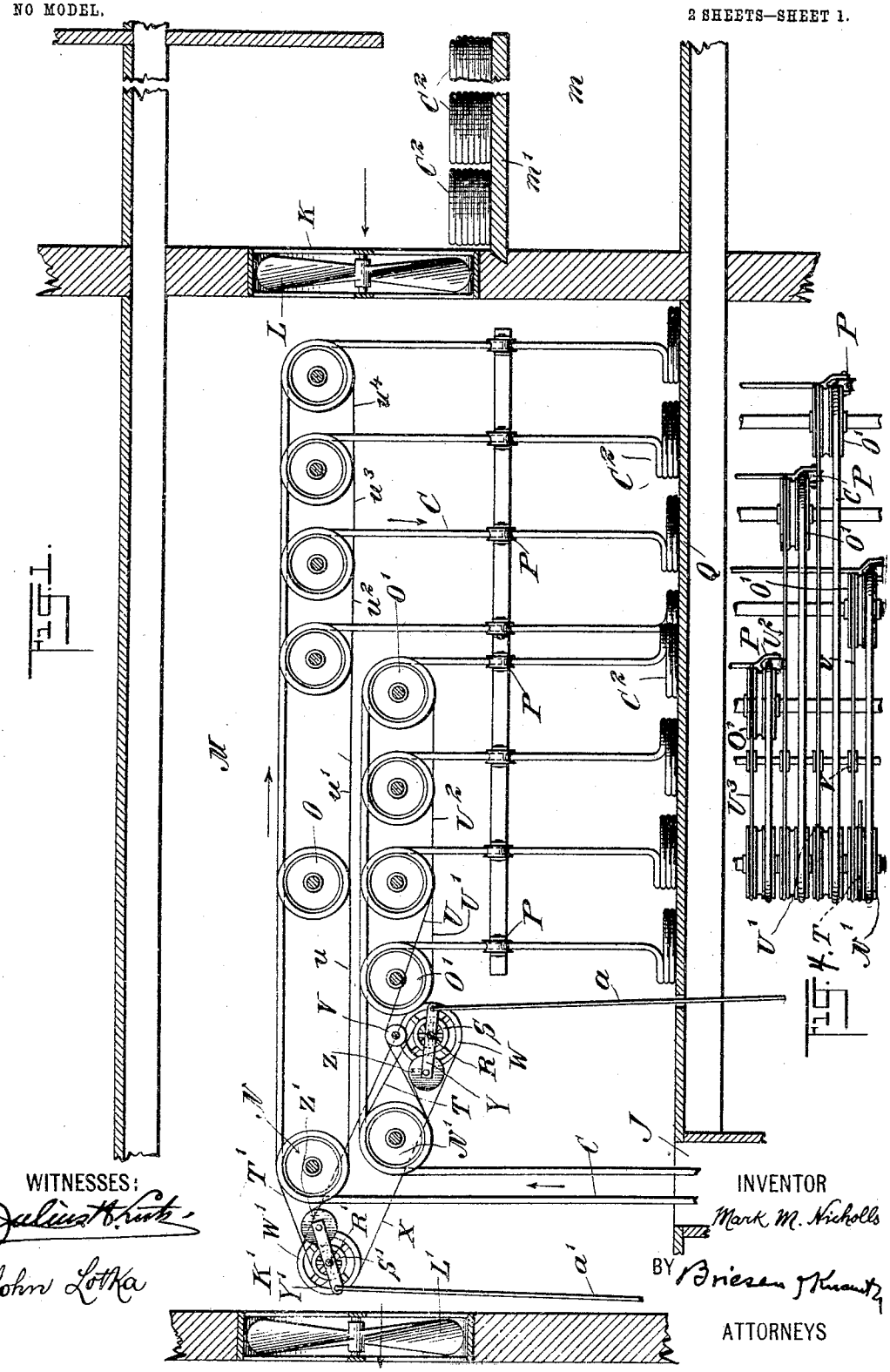
No. 767,422. PATENTED AUG. 16, 1904.

M. M. NICHOLLS.

MACHINE FOR APPLYING LIQUID OR VISCOUS SUBSTANCES.

APPLICATION FILED OCT. 8, 1903.

NO MODEL. 2 SHEETS—SHEET 1.



WITNESSES:

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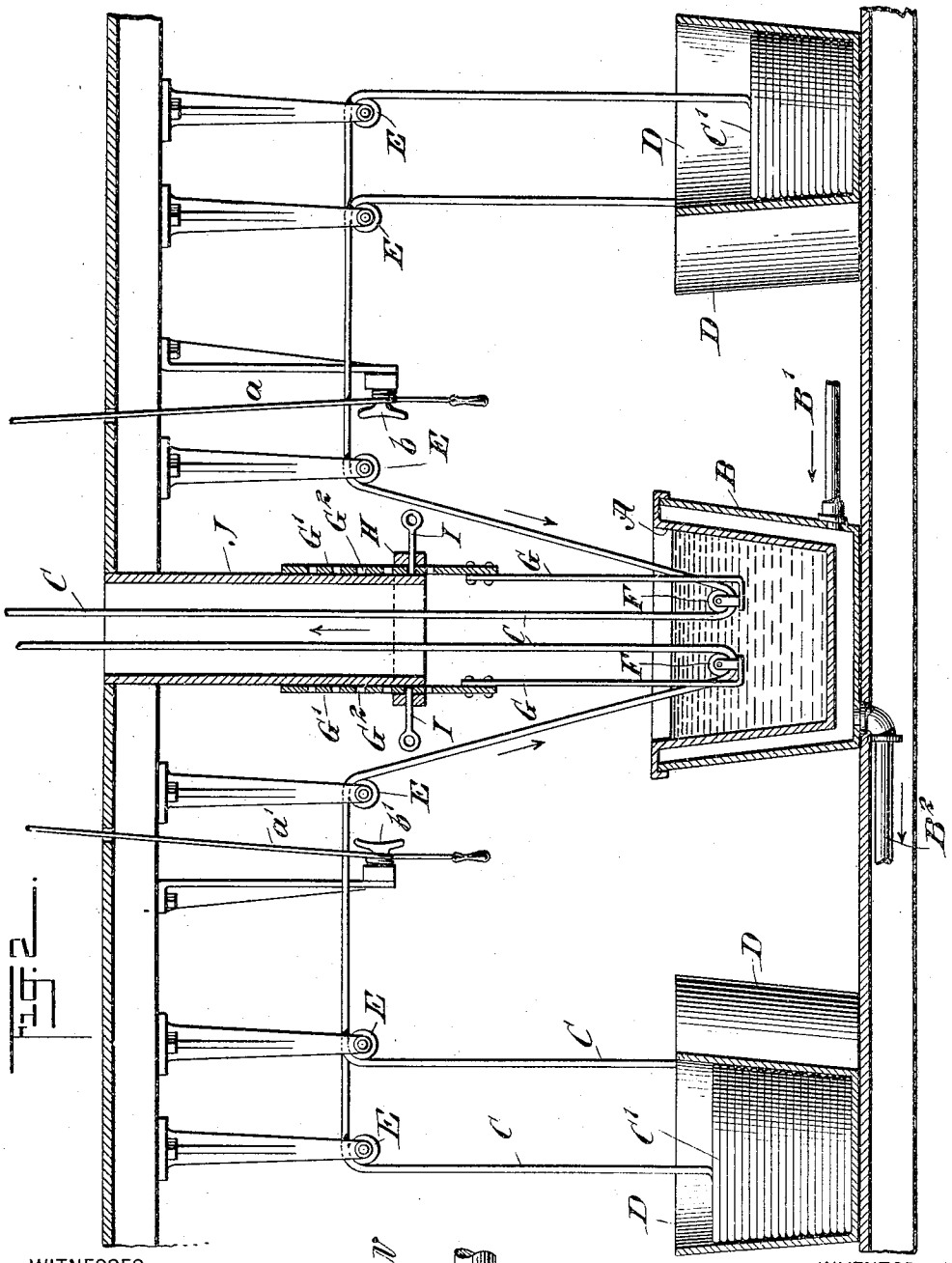


FIG. 2.

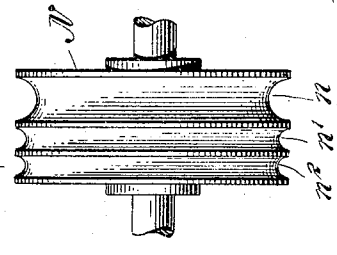


FIG. 3.

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UNITED STATES PATENT OFFICE.

MARK M. NICHOLLS, OF NEW YORK, N. Y.

MACHINE FOR APPLYING LIQUID OR VISCOUS SUBSTANCES.

SPECIFICATION forming part of Letters Patent No. 767,422, dated August 16, 1904.

Application filed October 8, 1903. Serial No. 176,173. (No model.)

To all whom it may concern:

Be it known that I, MARK M. NICHOLLS, a citizen of the United States, and a resident of the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Machines for Applying Liquid or Viscous Substances, of which the following is a specification.

My invention relates to machines for applying liquid or viscous substances to the surface of articles, such as flexible tubing; and has for its object to provide an efficient and readily-controlled machine for the above-indicated purpose which will not only apply the liquid in a uniform manner, so as to evenly coat the tubing, but will also facilitate and expedite the partial and the complete drying of the articles.

I will now proceed to describe the specific embodiment of my invention, which is represented in the accompanying drawings, and will then point out the novel features of my invention in the appended claims.

Figure 1 is an elevation of the upper half of the machine with parts in section. Fig. 2 is a like view of the lower half of the machine. Fig. 3 is a detail showing one of the pulleys which serve for transmitting motion and also for feeding and guiding the tubing, and Fig. 4 is a partial plan of the upper section of the machine.

The machine, as shown, is preferably constructed in two sections or halves, preferably located upon different floors of the factory, the drawings showing the upper half of the machine on the floor immediately above that which contains the lower half of the machine; but, if desired, other floors or stories may intervene between the two halves of the machine. The lower half of the machine may be termed the "coating-machine" proper, while the upper half may be termed the "feeding, drying, and delivery-machine."

The lower section of the machine comprises a coating-vat A, provided with a jacket B, into which steam or any other suitable agent may be introduced through a pipe B′, such agent leaving the jacket through a pipe B^2. The coating-vat A contains the liquid or composition with which the article, such as the tubing, is to be coated. This flexible tubing C is fed from coils C′, contained in receptacles D; but it will be understood that the tubing may be held in any other suitable manner in readiness to be fed to the coating-tank. The tubing passes over pulley E to grooved pulleys F, located within the coating-tank and carried by arms G. These arms are normally stationary, but are preferably capable of vertical adjustment, as by being secured to supports G, mounted to slide in a stationary guide H and adapted to be locked in position by pins I, extending through said guides and into one of a series of apertures G^2. In this manner the length of time that the tubing takes to pass through the coating-vat may be regulated by varying the distance of the pulleys F from the surface of the liquid, and it will be observed that each of the pulleys F is independently adjustable. The tubing being fed in the direction of the arrows by mechanism to be described presently passes upward from the coating-vat A, through a channel or chimney J, to the upper half of the machine. This upper half is located in a room preferably closed with the exception of its communication with the chimney J and with the exception of openings K K′, in which are set fans or ventilators L L′, which are so rotated as to draw air into the chamber M at the opening K and to expel air from the chamber M through the opening K′. In Fig. 1, therefore, there is an air-current passing from right to left in the chamber M, while the tubing travels from left to right, as will be presently described, and by causing the tubing to travel in the opposite direction to the air-current I secure a very efficient drying action. Of course any draft irrespective of its direction will hasten the drying; but the particular direction of the draft specified will yield the best results. After its passage through the chimney J the tubing is guided over pulleys N N′ and then over additional guide-pulleys O O′, the pulleys N O being preferably located in a tier above the pulleys N′ O′. Each length of tubing finally passes down from one of the pulleys O or O′ to a guide-pulley P, located in vertical alinement with the

point at which the tubing leaves the pulley O or O′, and preferably mounted to rotate about a horizontal axis located at a right angle to those of the pulleys O O′. The tubing upon reaching the floor Q will automatically lay itself into coils C^2.

The feed mechanism is as follows: R designates the main shaft, driven in any suitable manner and carrying a pulley S, from which a belt T passes to a pulley N′. In Fig. 3, n designates the outer groove of the pulley which receives the tubing, n' the groove which is adapted to receive the belt T, and n^2 the third groove, which is adapted to receive a belt or strap U, which passes over a small idler V to the second pulley O′ from the left. Several other pulleys are mounted on the same shaft with the pulley N′, which is driven directly from the shaft R, and from these other pulleys motion is transmitted to the several other pulleys O′, as by belts U' U^2 U^3, Fig. 4. The shaft R further carries a second pulley W, from which a belt extends to pulley W′ on a shaft R′, which also carries another pulley S′. A belt T′ forms a driving connection from the pulley S′ to the pulley N. A belt u transmits motion from the pulley N to the first of the pulleys O. Belts u' u^2 u^3 u^4 are employed to transmit motion from the shaft of the pulley N to the other pulleys O. If desired, additional pulleys may be mounted on the shafts of the pulleys O O′ to properly support and guide the tubing C. On the shafts R R′ are loosely mounted arms Y Y′, respectively, carrying tension-rollers Z Z′, adapted to be pressed upward against the belts T T′ by a pull on the cords or wires a a'. These cords or wires may extend downward to the floor which supports the lower half of the machine and may there be secured in any suitable manner, as by wrapping them around stationary pegs b b'. I prefer to set the tension-rollers Y Y′ in such a manner that the belts T T′ will have just sufficient tension to feed the tubing C under normal conditions. If, however, for any reason there is an abnormal resistance to the feed of the tubing—as, for instance, if the tubing should happen to get caught in the coating-tank—the belt will simply slip on the pulley N or N′, and thus breakage or other injury to the material will be prevented.

It will be understood that the fans L L′ not only produce in the chamber M a draft of air in the opposite direction to the movement of the tubing, but also produce in a certain measure an upward draft in the chimney J, thus assisting in a measure the drying of the tubing. It will be understood, however, that when the tubing forms the coils C^2 it is only partially dried, and in order to complete the drying of the article attendants remove the coils C^2 from the chamber M into an adjacent drying-chamber m, where a floor m', shelves, or other supports are provided to receive the coils C^2. The door or doors through which access is had from the chamber M to the chamber m are generally kept closed, so that the fan L will produce a current of air in the chamber m also.

It will be understood that the feeding of the tubing may be arrested at any time by loosing the cords or wires a a' from their fastenings, thus causing the tension-rollers Z Z′ to drop away from the belts T T′.

Various modifications may be made without departing from the nature of my invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. In an apparatus of the character described, the combination of a coating-vat, means for conducting a plurality of lengths of tubing through the coating-vat, means for receiving the tubing after it is coated, and means for arresting the movement of any individual length of tubing without arresting other lengths.

2. In an apparatus of the character described, the combination of a coating-vat, grooved means for conducting tubing through said vat, grooved means for receiving the tubing after it is coated, means for drying the tubing on its passage from the coating-vat to the point of delivery, and means for arresting the movement of the tubing at will.

3. In an apparatus of the character described, the combination of a coating-vat, means for conducting the tubing through the vat, means for receiving the tubing after it is coated, means for drying the tubing on its passage from the coating-vat to the point of delivery, adjustable means for regulating the amount of coating material which the tubing takes up during its passage through the coating-vat, and means for arresting the movement of the tubing at will.

4. In an apparatus of the character described, the combination with a coating mechanism proper, of a drying-chamber at a distance therefrom, a chimney through which said drying-chamber connects with the coating mechanism, means for feeding the coated material from the coating mechanism to the drying-chamber through the said chimney, and means for producing a draft in said drying-chamber.

5. In an apparatus of the character described, the combination with a coating mechanism proper, of a drying-chamber, feeding mechanism located in said drying-chamber and arranged to convey the coated material from the coating mechanism to the drying-chamber, said feeding mechanism being constructed to cause the material to travel horizontally lengthwise of the drying-chamber, and means for producing in said drying-chamber a draft in the opposite direction to the travel of the coated material.

6. In an apparatus of the character described, the combination with coating mechanism proper, of a preliminary drying-cham-

ber, a final drying-chamber communicating with the preliminary drying-chamber, means for feeding the material from the coating mechanism to the preliminary drying-chamber, and means for producing a draft from the final drying-chamber to and through the preliminary drying-chamber.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MARK M. NICHOLLS.

Witnesses:

EUGENE EBLE,

CHAS. F. TISCH.