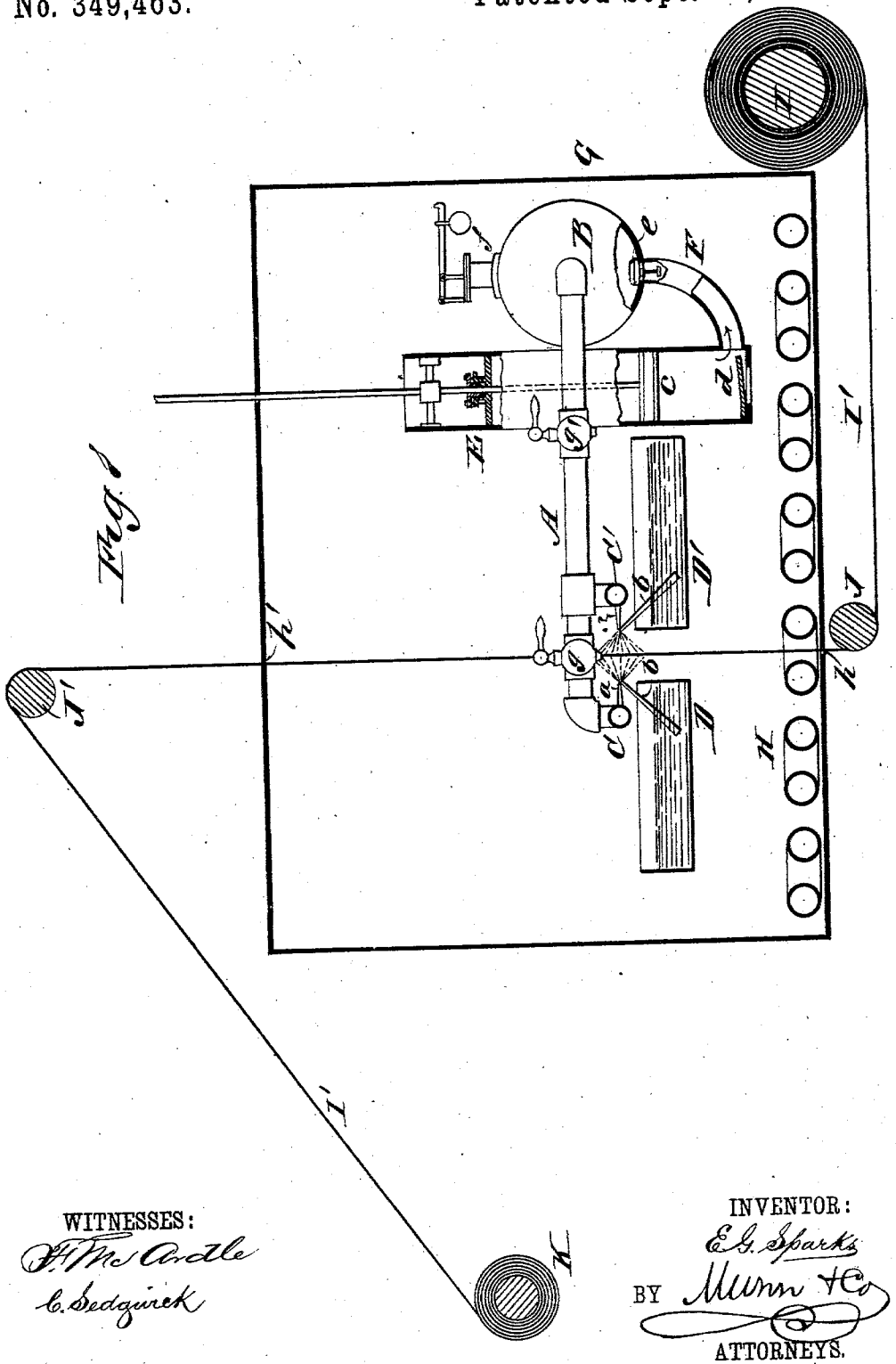
(No Model.) 4 Sheets—Sheet 1.

E. G. SPARKS.

PROCESS OF AND APPARATUS FOR COATING FABRICS.

No. 349,463. Patented Sept. 21, 1886.



WITNESSES:
H. McArdle
C. Sedgwick

INVENTOR:
E. G. Sparks
BY Munn & Co
ATTORNEYS.

(No Model.) 4 Sheets—Sheet 2.

E. G. SPARKS.

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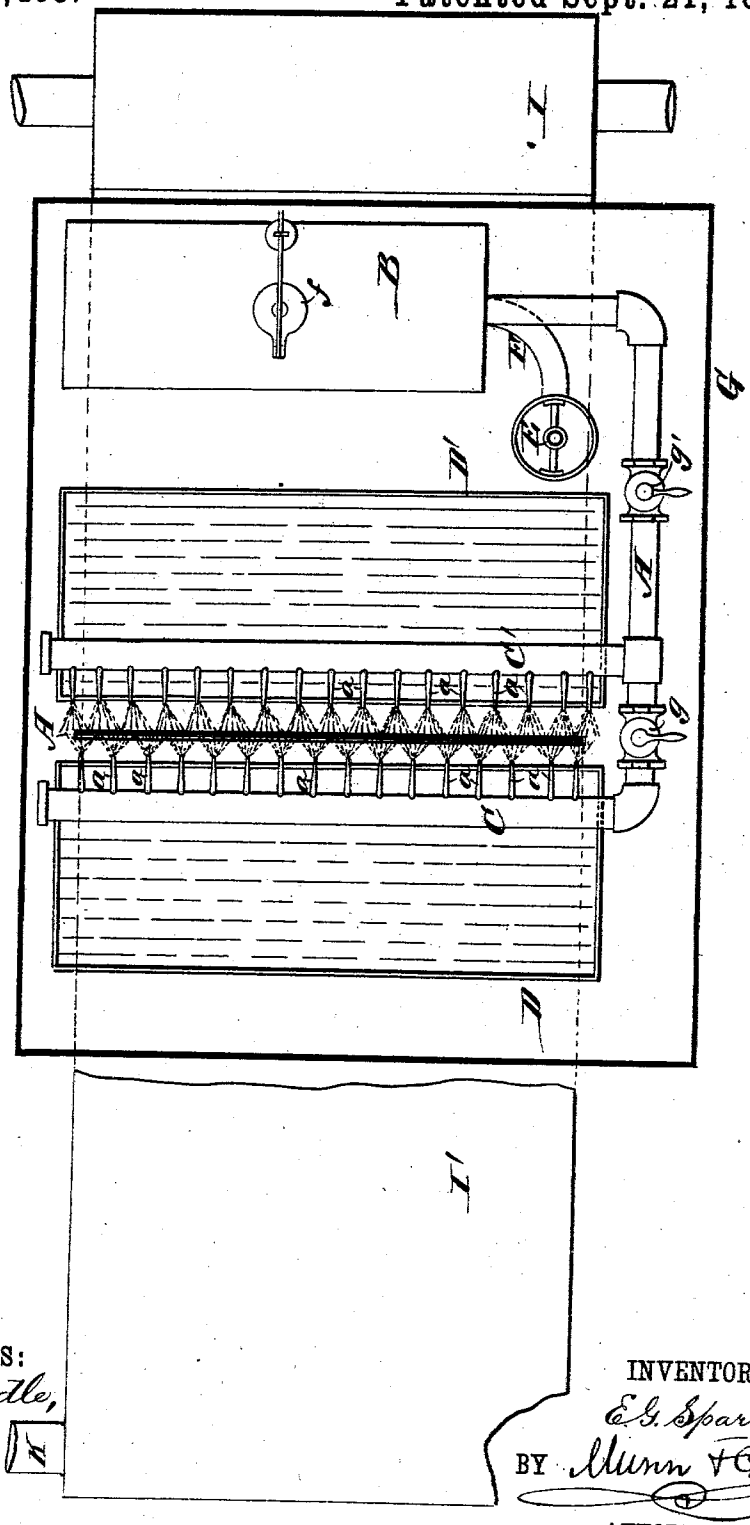


Fig. 2

WITNESSES:
F. McArdle,
C. Sedgwick

INVENTOR:
E. G. Sparks
BY Munn & Co.
ATTORNEYS.

(No Model.) 4 Sheets—Sheet 3.

E. G. SPARKS.

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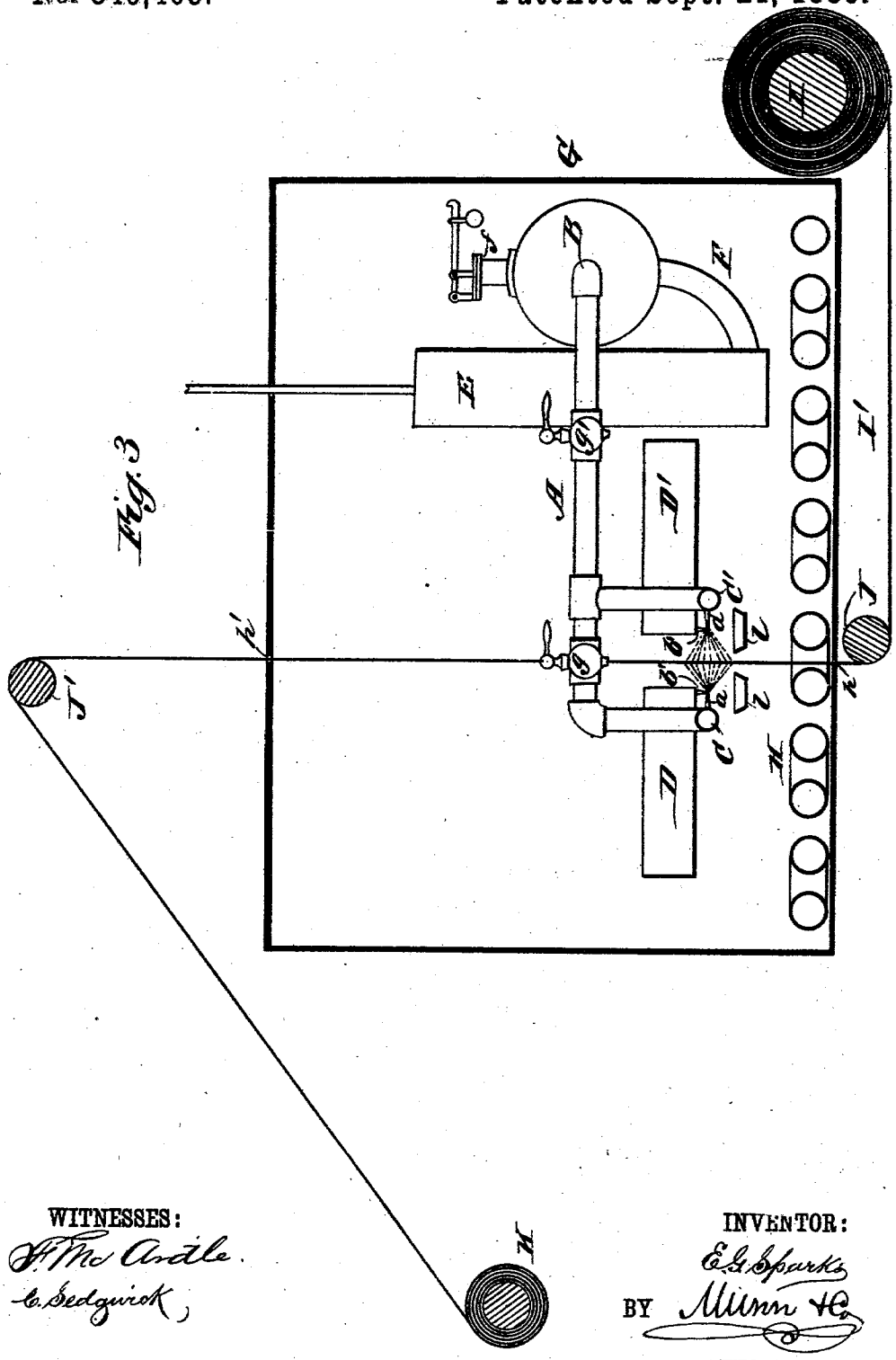


Fig. 3.

WITNESSES:
H. McArdle.
C. Sedgwick.

INVENTOR:
E. G. Sparks
BY Munn & Co.
ATTORNEYS.

(No Model.) 4 Sheets—Sheet 4.

E. G. SPARKS.

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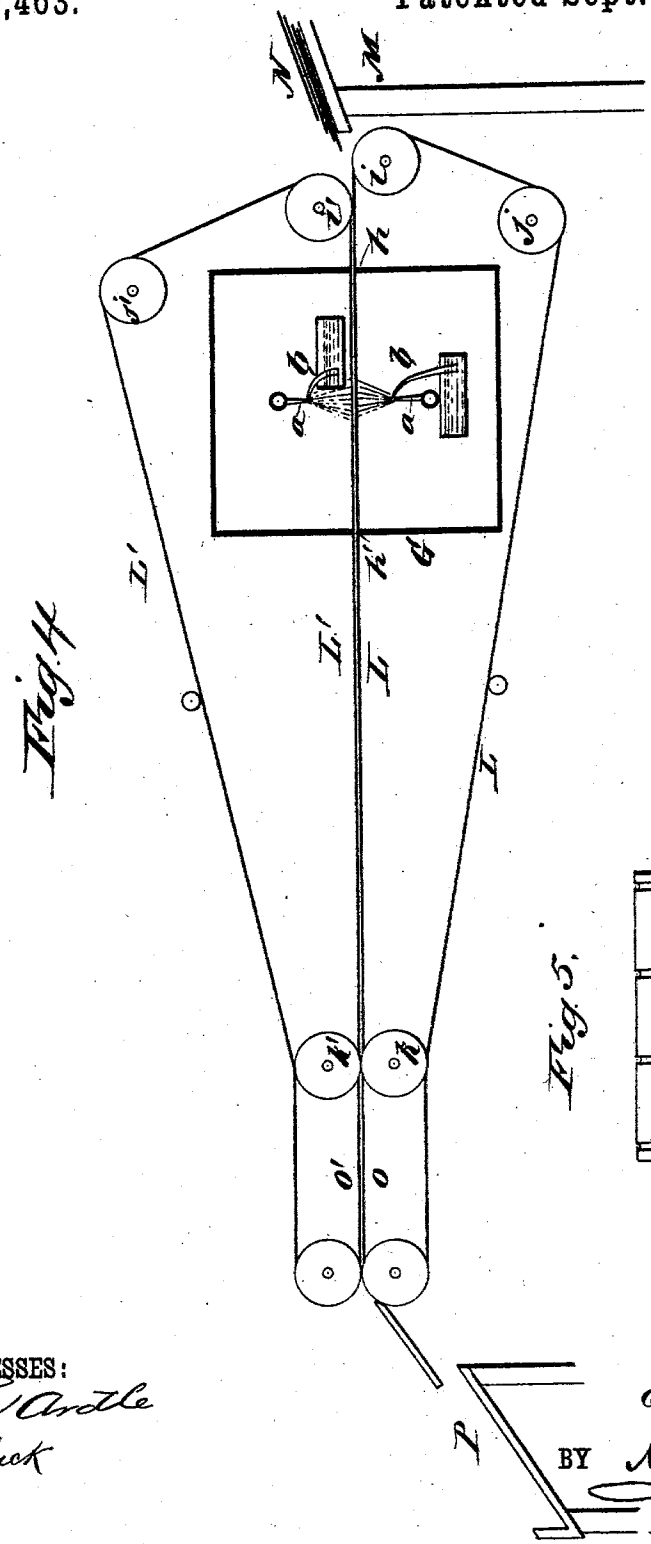


Fig. 4.

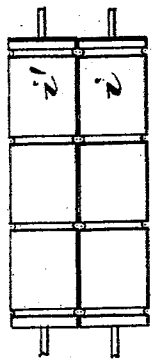


Fig. 5.

WITNESSES:
F. McArdle
C. Sedgwick

INVENTOR:
E. G. Sparks
BY Munn & Co.
ATTORNEYS.

UNITED STATES PATENT OFFICE.

EDWARD G. SPARKS, OF BROOKLYN, NEW YORK.

PROCESS OF AND APPARATUS FOR COATING FABRICS.

SPECIFICATION forming part of Letters Patent No. 349,463, dated September 21, 1886.

Application filed February 25, 1886. Serial No. 193,233. (No model.)

To all whom it may concern:

Be it known that I, EDWARD G. SPARKS, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Process of and Apparatus for Coating Fabrics, of which the following is a specification, reference being had to the annexed drawings, forming a part thereof, in which—

Figure 1 is a side elevation of one form of my improved apparatus for coating fabrics from a continuous roll. Fig. 2 is a plan view. Fig. 3 represents a modified form. Fig. 4 is a side elevation of my improved apparatus adapted to coat sheets. Fig. 5 is a face view of two cord-carrying rollers.

Similar letters of reference indicate corresponding parts in the different figures of the drawings.

The object of my invention is to provide an improved process for coating paper, cloth, and other fabrics with paraffine, wax, or other coating material, or for saturating them with curative agents, and to provide suitable means for practically carrying out the process.

My improved process of coating paper with wax, paraffine, or other coating material consists in projecting upon one or both sides of the paper a fine spray of the coating material and maintaining the apparatus and the coating material in a heated condition to insure the uniform spraying of the coating material over the entire surface of the fabrics to be coated.

It also consists in apparatus for spraying the coating material upon the fabric, as hereinafter more fully described.

In carrying out my invention I provide two sets of atomizers—one set for each side of the fabric—and in cases where the fabric is to be coated with material rendered liquid by fusion I inclose the coating apparatus in a heated chamber to maintain the coating material in a heated condition. A pipe, A, connected with an air-reservoir, B, communicates with the atomizer-tubes C C′, which are arranged parallel with each other and extend horizontally over the vats D D′, in which the coating material is contained. The tubes C C′ are provided with series of jets *a*, which are arranged horizontally, pointing toward each other, the series of jets connected with the tube C being preferably arranged to alternate in position with the jets projecting from the tube C′; but I do not confine myself to this arrangement. Each jet *a* is provided with a tube, *b*, one end of which adjoins the extremity of the jet. The other end dips into the liquid coating material contained by the vats D D′. An air-pump, E, of ordinary construction, is connected with the reservoir B by the pipe F, the air-pump being arranged so that when its piston *c* is raised air will enter through the valve *d*, and when its piston is lowered the valve *d* will be closed, and air will be forced through the discharge-valve *e* into the reservoir B, where it will be retained by the valve *e*. The reservoir B is provided with a safety-valve, *f*, of ordinary construction, to prevent over-pressure in the reservoir. The pipe A is provided with stop-cocks *g g′*, for regulating the flow of air under pressure to the jets *a*.

When the apparatus is to be used for applying wax, paraffine, or similar coating material to paper or other fabrics, the atomizing, air-condensing, and spraying apparatus is inclosed in a chamber, G, provided in the bottom thereof with a series of steam-pipes, H, by which the desired temperature may be maintained. The fabric I′, to be coated, is taken from the roll I over the guide-roller J, through a slit, *h*, in the bottom of the chamber G, thence upward through the chamber and between the series of jets *a* and vats D D′, through a slit, *h′*, in the top of the chamber G, over the guide-roller J′, thence to the roller K, upon which the finished fabric is received. Rotary motion is imparted to the roller K, so that the fabric I′ is drawn from the roll I through the chamber at a suitable speed, and the air-pump E is operated in any convenient way, drawing the heated air from the chamber G and compressing it in the reservoir B. The escape of the air through each jet *a* forms a vacuum in the mouth of the tube *b*, thus causing the liquid material to be drawn upward from the tube, and the forcible discharge of air from the jet atomizes the coating material in the usual well-known way, and projects it upon the fabric being drawn through the chamber. When it is desired to coat the fab-

ric on one side only, the stop-cock *g* will be closed, and only the atomizers connected with the pipe C′ will be used. The distance between the top of the chamber G and the guide-roller J will be sufficient to permit of the cooling of the coating material before it reaches the guide-roller; and where waterproofing varnish, remedial agents, or other coating material is applied which require drying before rolling the fabric upon the roller K the distance between the atomizers and the guide-roller J′ will be varied according to requirements. In some instances, instead of taking the coating material from the top of the vat by tubes *b*, I insert the tubes *b′* in the bottom of the vats, and place the pipes C C′ below the vats, as shown in Fig. 3, and allow the coating material to flow into the jets by gravity. In this case, to catch any coating material that may drip from the tubes *b′*, I provide troughs *l*, which are placed under the series of jets.

To coat single sheets of paper or other material by an arrangement of spray-jets, I provide a chamber, G, having slits *h h′* in opposite sides thereof, for the admission and discharge of the paper sheets, and I arrange two sets of endless cords, L L′, running over grooved rollers, for conveying the sheets through the chamber G. The endless cords L run over the grooved rollers *i j k*, through and around the chamber G, and the endless cords L′ run over the grooved rollers *i′ j′ k′*, through and around the chamber G. The endless cords L run horizontally between the rollers *i k* through the slits *h h′*, and the cords L′ run horizontally from the roller *i′* to the roller *k′* through the slits *h h′*, so that the two series of cords in their passage through the chamber G are parallel. The lower series, L, project beyond the upper series toward the sheet-support M, so that the sheets N, fed to the apparatus from the support, will be received on the lower series of cords and carried forward under the upper series, after which they will be carried by and between the two series, through the chamber, and between the jets *a*, arranged above and below the path of the sheets. The sheets, after having received their coating in the chamber, are carried forward between the series of cords L L′ and allowed to cool, and are then delivered to the series of endless cords O O′, which carry the sheets forward to a receptacle, P, arranged to receive them.

To permit of arranging the jet-tubes *a* vertically, in the present case the tubes *b* for conveying the coating material to the jet-tubes are curved, as shown in the drawings, and the heating and air-compressing appliances in this case will be the same as those above described.

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

1. The method of coating paper with wax, consisting, essentially, in spraying the wax in a soft, liquid, or melted state onto the paper, substantially as set forth.

2. The method of applying coating material to fabrics, which consists in projecting the coating material upon the fabric in the form of spray, and carrying the fabric forward through the spraying apparatus to continuously present a new surface to the action of the spray, substantially as herein shown and described.

3. The method of coating fabrics, which consists in spraying the coating material upon the fabric while the coating material and the fabric are in a heated condition, substantially as herein shown and described.

4. In apparatus for coating fabrics, one or more series of spray-tubes adapted to project the coating material on the fabric to be coated, and means for continuously feeding the fabric forward, substantially as herein shown and described.

5. In apparatus for coating fabrics, the combination, with one or more series of jets for spraying the coating material upon the fabric, and mechanism for carrying the fabric forward, of means for maintaining the fabric and the coating material in a heated condition, substantially as herein shown and described.

6. In apparatus for coating fabrics, the combination, with the series of spray-tubes, an air-compressor, and an air-reservoir, and vats for containing the coating material, of the chamber G, inclosing the air-compressing and spraying apparatus, and means for maintaining the chamber in a heated condition, substantially as herein shown and described.

7. The combination, in apparatus for coating fabrics, of the jets *a*, tubes *b*, air-reservoir B, pipes communicating between the jets *a* and the air-reservoir, the air-pump E, for compressing air in the reservoir, vats D D′, for containing the coating material, the chamber G, having slits *h h′*, for the passage of the fabric, and steam-pipes H, for maintaining the chamber in a heated condition, substantially as herein shown and described.

EDWARD G. SPARKS.

Witnesses:
GEO. M. HOPKINS,
C. SEDGWICK.