No. 705,856. Patented July 29, 1902.

D. MATTEI.

APPARATUS FOR DYEING, &c.

(Application filed Aug. 17, 1897.)

(No Model.) 4 Sheets—Sheet 1.

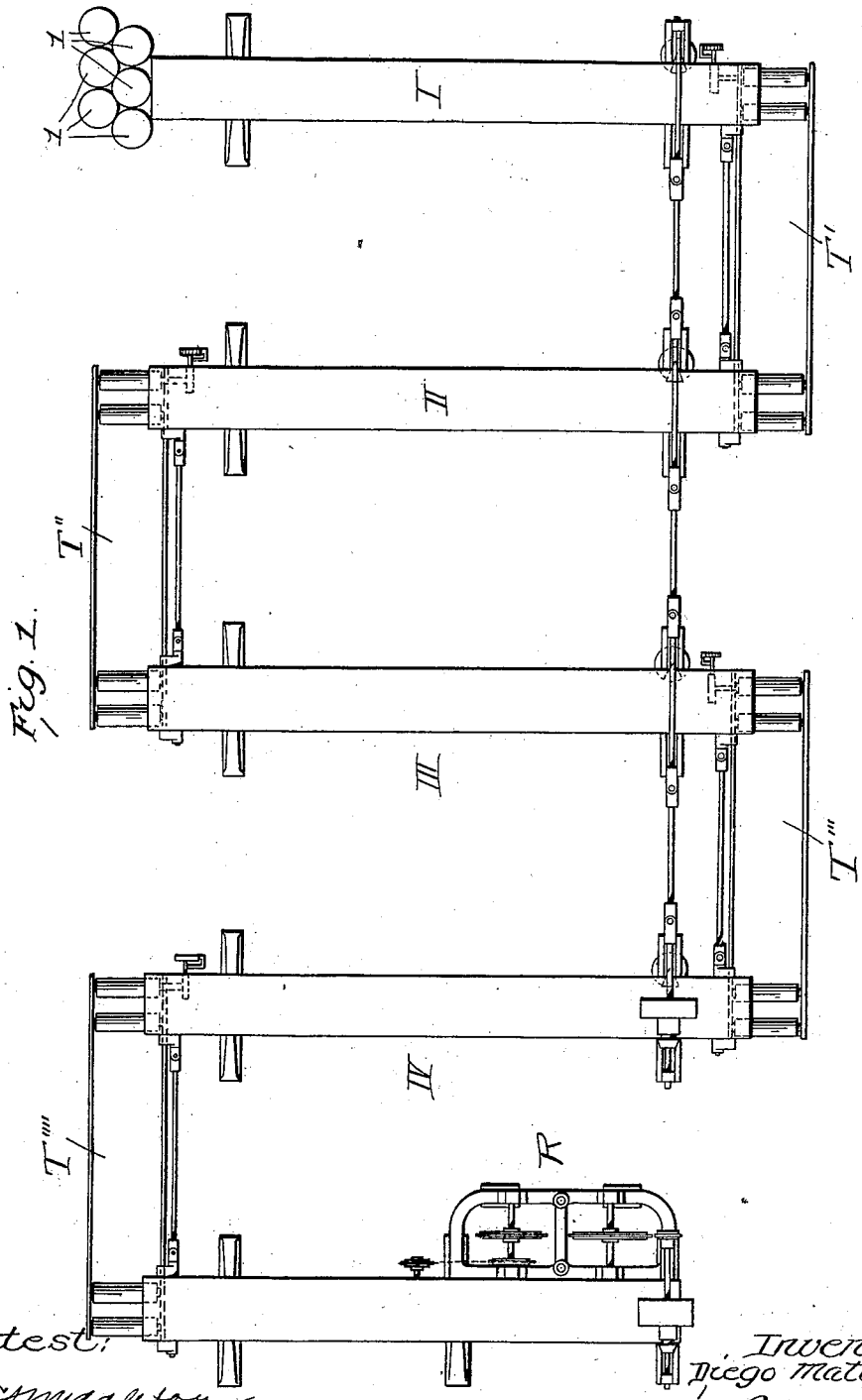


Fig. 1.

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No. 705,856. Patented July 29, 1902.

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APPARATUS FOR DYEING, &c.

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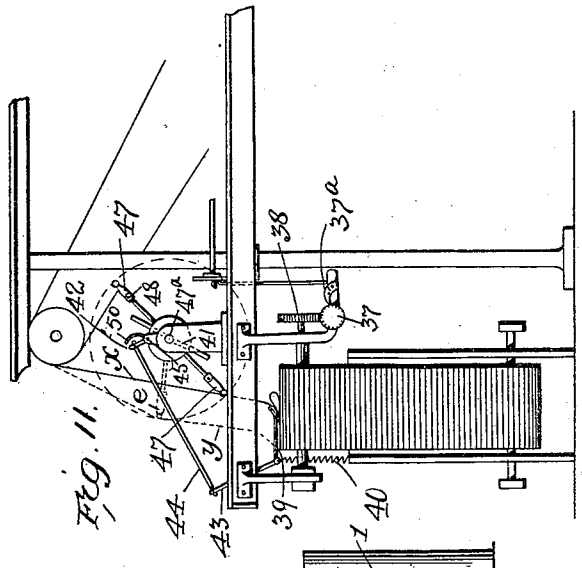


Fig. 11.

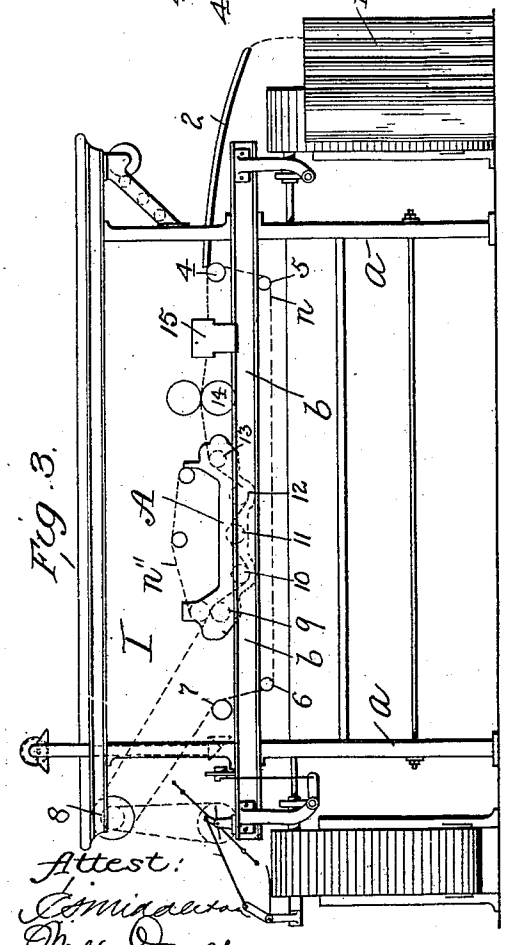


Fig. 3.

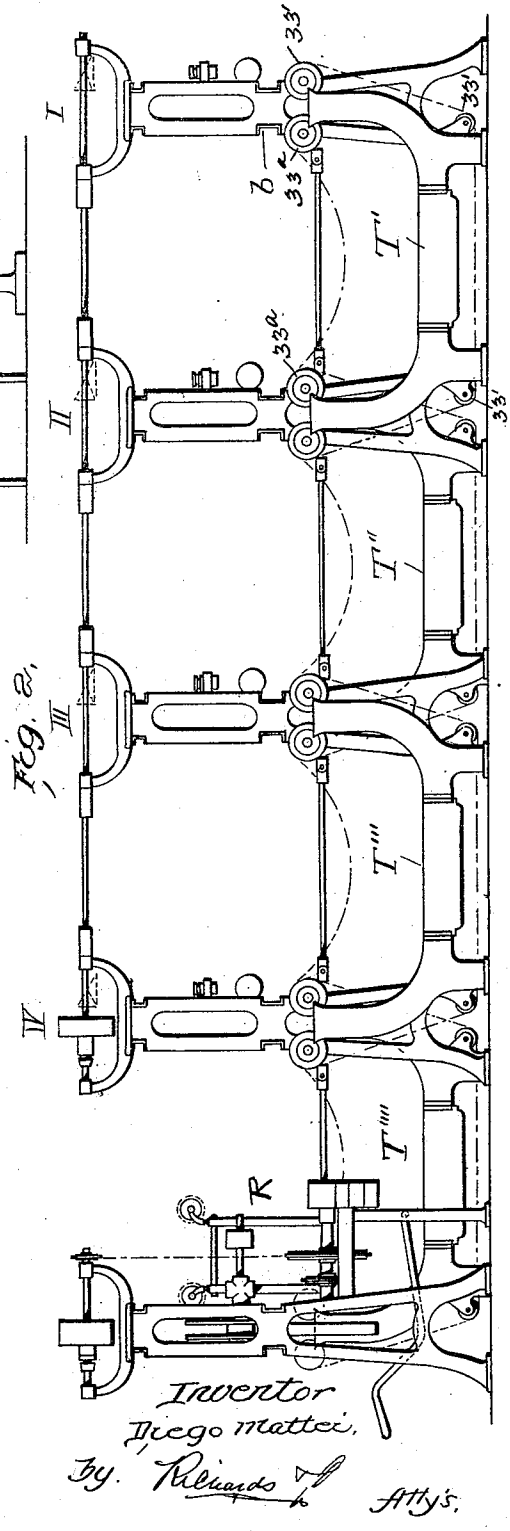


Fig. 2.

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Fig. 4.

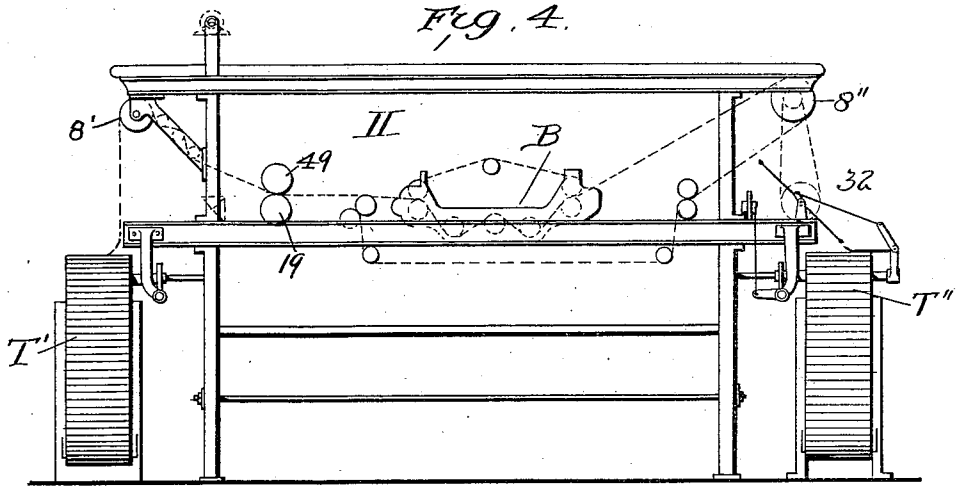
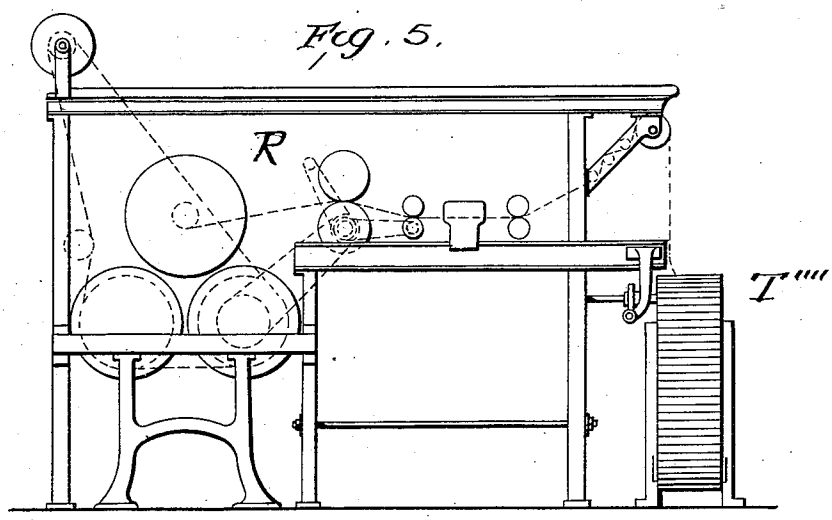


Fig. 5.



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APPARATUS FOR DYEING, &c.

(Application filed Aug. 17, 1897.)

(No Model.) 4 Sheets—Sheet 4.

Fig. 6.

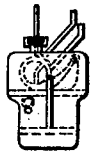


Fig. 7.

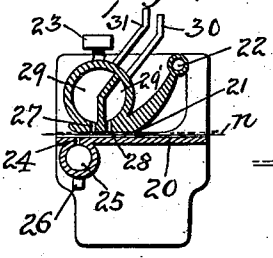


Fig. 8.

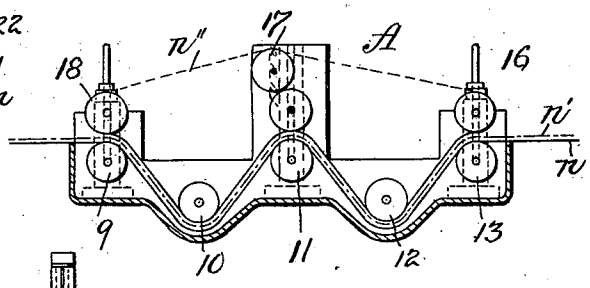


Fig. 9.

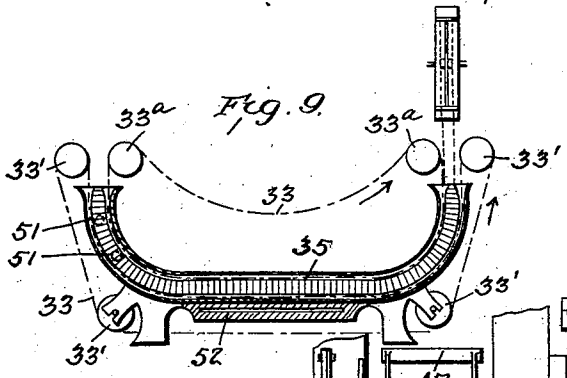


Fig. 10.

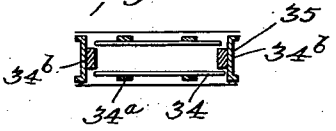
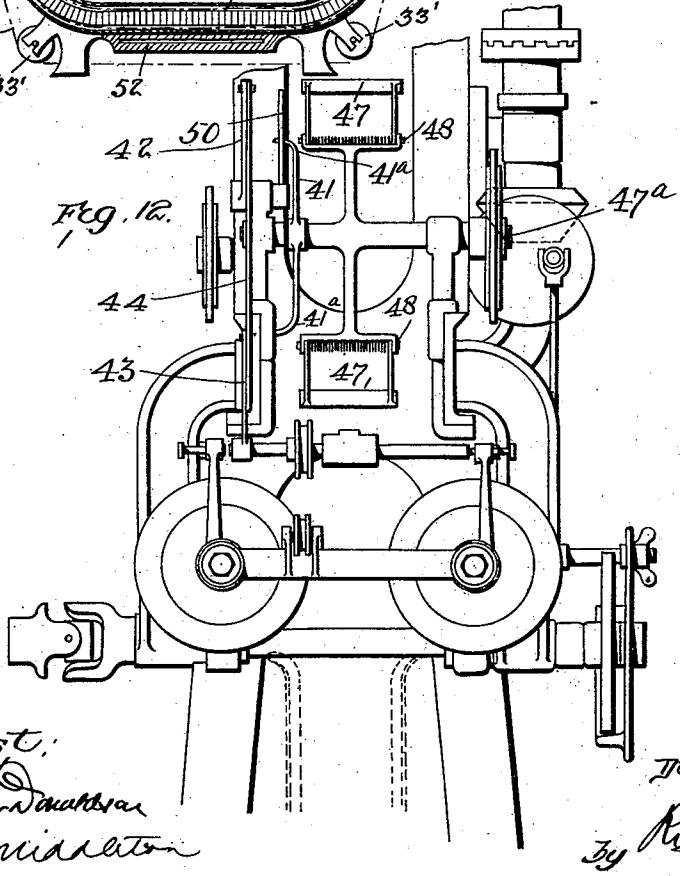


Fig. 12.



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UNITED STATES PATENT OFFICE.

DIEGO MATTEI, OF GENOA, ITALY.

APPARATUS FOR DYEING, &c.

SPECIFICATION forming part of Letters Patent No. 705,856, dated July 29, 1902.

Application filed August 17, 1897. Serial No. 648,598. (No model.)

To all whom it may concern:

Be it known that I, DIEGO MATTEI, a subject of the King of Italy, residing at Genoa, Italy, have invented certain new and useful Improvements in the Dyeing of Cotton and other Textile Fibers and in Apparatus Therefor, of which the following is a specification.

The invention consists in the features and combination and arrangement of parts hereinafter described, and particularly pointed out in the claims.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a plan view showing the general form of apparatus. Fig. 2 is a front view of Fig. 1. Figs. 3 and 4 show, respectively, side elevations of the first and second sections of the apparatus. Fig. 5 is a view of the winding apparatus. Figs. 6 and 7 are detail views of the injector. Fig. 8 is a view of one of the dyeing-tanks. Fig. 9 is a view of conveyer means whereby the sliver is carried from one section of the apparatus to the next section. Fig. 10 is a detail cross-sectional view of the conveyer. Fig. 11 is a side elevation of means for feeding the sliver in folds to the conveyer. Fig. 12 is an end view of parts shown in Fig. 11.

The general form of apparatus is shown in Figs. 1 and 2. It comprises sections I II III IV, in each of which there is a bath through which the sliver is passed. Between the sections I and II a conveyer apparatus T′ is arranged, which carries the sliver after it is passed through the section I of the apparatus to the section II. After having passed through the bath in the section II the sliver is fed to another conveyer T″, which carries it to the section III, and after being subjected to the bath therein it is transferred from this section of the apparatus to section IV by means of a conveyer T‴. A like conveyer T⁗ carries the sliver from section IV to the winding apparatus R. Each section is composed of suitable standards *a*, supporting a framework *b*, as shown in Fig. 3. In this framework a series of rollers are suitably supported, which rollers will be hereinafter referred to.

The sliver passes first from the pots or receptacles 1, Figs. 1 and 3, over a table 2 and onto a belt *n*, Figs. 1 and 8, which is perforated and which is guided over rollers 4, 14, 13, 12, 10, 9, 8, 7, 6, and 5, Fig. 3. While supported on this band or belt the slivers pass an injector 15, (shown detached in Figs. 6 and 7,) which will be described hereinafter. From this injector the carrying-band *n* conducts the slivers to a tank A, Figs. 1 and 8. This tank contains a liquid, (generally pure water, but sometimes a solution of soda or a dyeing liquid used to give the material a preliminary dye or tint.) In passing through this tank the slivers are not guided on their lower surfaces only, but they are operated upon by a band *n*″. The sliver is indicated at *n*′, Fig. 8, and, as shown in Fig. 8, it passes between the two bands *n* and *n*″. The band *n*″ passes around rollers 16, 12, 11, 10, 18, and 17, and in the lower part of its course it is parallel to the band *n*. The rollers last mentioned are journaled in the walls of the tank A, and this is true also of the rollers 9, 10, 11, 12, and 13. On leaving the tank A the slivers are carried by the band up over the roller 8, journaled in the frame, and it is thence directed to the conveyer apparatus T′ to be transferred to the second section II of the apparatus. Beneath the roller 8 of the first section and between the same and the conveyer apparatus T′ a controlling apparatus is located, whereby the slivers will be arranged in folds as they are fed to the conveyer apparatus T′. This controlling apparatus, Figs. 3, 11, and 12, comprises a reel made up of arms carrying paddles or blades 47, pivoted at 48, the said arms rotating with a shaft 47ª, suitably journaled in the frame. These arms are adapted to strike the slivers, and by them the course of the slivers is changed from one side of the conveyer apparatus to the other, as shown in Fig. 11. In the present position of the parts the course of the slivers is indicated in full lines at *x*; but when the reel-arms assume the position shown at *e* in dotted lines the slivers then are fed to the conveyer apparatus to the position shown in dotted lines at *y*. By these means the slivers will be arranged in folds. To facilitate this action, a plate 39 is employed having oscillating movement from a vertical to a horizontal position, and vice versa, this plate being arranged to press the layer or fold

when it is taking its place in the conveyer apparatus. The oscillating presser-plate 39 is moved to horizontal position by means of a spring 40, and it is raised to an upright position by means of a crank-arm 43 and link 44 and crank-arm 42, which is pivoted at 45 eccentrically in relation to the center of the reel. These connections are operated through a crank-arm 50 on the short shaft to which the crank-arm 42 is attached, the said arm 50 being in turn operated by arms 41, carried by the reel-shaft 47ª and having fingers 41ª, Fig. 12, bent laterally to engage the arm 50 and move it a part of a revolution. The arms 50 and 41 being on different centers will cause the finger 41ª to leave the arm 50 at a certain point in the revolution of the parts, and then the spring 40 will return the presser-plate 39 into horizontal position.

The conveyer T′ comprises two bands, each marked 33, Fig. 9. The lower band passes over a series of rollers 33′ and through a vessel or tank 35. The upper band passes over two rollers 33ª and thence through the said vessel 35. These bands comprise, as shown in Fig. 10, cross-slats 34, attached to flexible strips 34ª, and they are guided by the ribs 34ᵇ in the tank or vessel 35, so as to remain parallel with each other at a predetermined distance apart. Motion is imparted to the band through any suitable mechanism—such, for instance, as a worm-wheel 38, Fig. 11, on the shaft of one of the rollers 33′, operated from a worm on the shaft of a ratchet-wheel 37, which is operated by a pawl 37ª, driven from any suitable source. The vessel 35 is intended to catch any of the liquid which drops from the slivers as they are being transferred from section I to section II of the apparatus. The conveyer-bands 33 travel in the direction of the arrows, as shown in Fig. 9, and from their discharge ends the slivers are directed up over a roller 8′, Fig. 4, supported on the section II of the apparatus. From here the slivers are directed between the rollers 19 and 49 and thence through a tank B, which is substantially similar to the tank A, before described, and has the same combination of rollers and bands. This tank contains liquid dyes for treating the slivers, and from this point the slivers are directed up over a roller 8″ and thence downwardly to a conveyer T″, which is similar in all respects to the conveyer T′, just described. A fold-controlling mechanism is located between the roller 8″ and this conveyer T″, as shown generally at 32, Fig. 4, this controlling apparatus being the same in all substantial respects to the one before described. As shown in Fig. 1, this conveyer T″ carries the slivers to the section III of the apparatus, where they are subjected to another dyeing-bath, and, as before indicated, the course of the slivers is thence through conveyer T‴, section IV, with its bath, conveyer T⁗, and winding apparatus R. As the conveyers T‴ and T⁗ are like the one before described, no specific description thereof is necessary. The same is true of the sections III and IV, these being similar to section I as thus far described, with the exception that no guiding-surfaces, such as 2, are necessary at these sections. The conveyer-chambers 35 are provided with discharge-openings 51, through which the liquid may pass off when it reaches this height. As the slivers pass through the conveyer-chambers they are kept hot, and as they leave these conveyer-chambers the liquid will drip therefrom previous to their entering the next succeeding section. The conveyer-chambers are formed with a double bottom 52, to which steam may be supplied in any suitable way for keeping the chambers hot. The winding apparatus R is of any suitable construction. The rollers 49 and 19 may serve to wring out the slivers.

Referring to the section I of the apparatus, it will be noticed that the injector 15 is arranged at or near the entrance of the sliver into this section. A plate 20, Figs. 6 and 7, serves to support the slivers and the band *n* as they pass by the injector. Above this plate there is another guiding-plate 21 on an arm pivoted at 22 to the frame of the injector. This arm is arranged to fall by gravity, being provided with a weight 23, and it is provided with boxes 29 and 29′. A steam-pipe 30 connects with the box 29′, and a jet-opening 28 directs the steam from this box onto the slivers lying upon the perforated belt *n* on the plate 20. Water is supplied under pressure through a pipe 31 to the box 29, and this water is directed through a jet-opening 27 onto the slivers, this jet operating immediately after the sliver passes the steam-jet. From this jet-opening 27 the sliver passes along and next encounters a jet of water directed upwardly from an opening 24 from a box 25, to which water is supplied through a pipe 26. By this arrangement it will be seen that the sliver *n*′ to be impregnated with the dye is first struck by a steam-jet, which expels all the air from the sliver, and then it is subjected to two consecutive jets of water, one operating upon the upper side and one upon the lower side of the sliver. These water-jets condense the steam and leave the fibers of the slivers thoroughly impregnated with the liquid and ready for effective treatment by the dye-baths.

I have shown the injector 15 only in connection with the first section of the apparatus. I do not, however, wish to limit myself in this respect. The slivers may be passed through the apparatus in any suitable number, one from each of the pots shown in Fig. 1, and these slivers may be superimposed.

I claim—

1. In combination, the guides for the sliver, a bath through which the sliver is passed and a device having a steam and a liquid jet arranged to act on the said sliver before the same enters the bath, substantially as described.

2. In combination, a bath, means for direct-

ing the sliver thereto and a moistening-jet device arranged adjacent to the path of the sliver, said jet device being supported to move toward the sliver by gravity, substantially as described.

3. In combination, the carrier-belts for the sliver, the bath, the guide over which the sliver passes, a box 25 having a discharge-opening directed toward the belt and below the same, and a box 29 arranged above the belt and having two compartments one for steam and one for water with discharge-openings in each directed toward the sliver on the belt, substantially as described.

4. In combination, a series of tanks, means for passing the sliver through the tanks comprising endless belts, carrier means for conveying the sliver from one endless belt of one tank to that of the next tank, said carrier means including a pair of endless belts to receive the sliver between them and means for arranging the sliver in folds between the said belts, said means comprising the reel and the movable plate 39 and operating means therefor, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

DIEGO MATTEI.

Witnesses:
SANTO ZINCO,
OTTORINO LAZZARI.