June 29, 1926. 1,590,417

H. J. BRUNK

MEANS FOR APPLYING A SENSITIZING COATING TO PAPER

Filed August 1, 1925 2 Sheets-Sheet 1

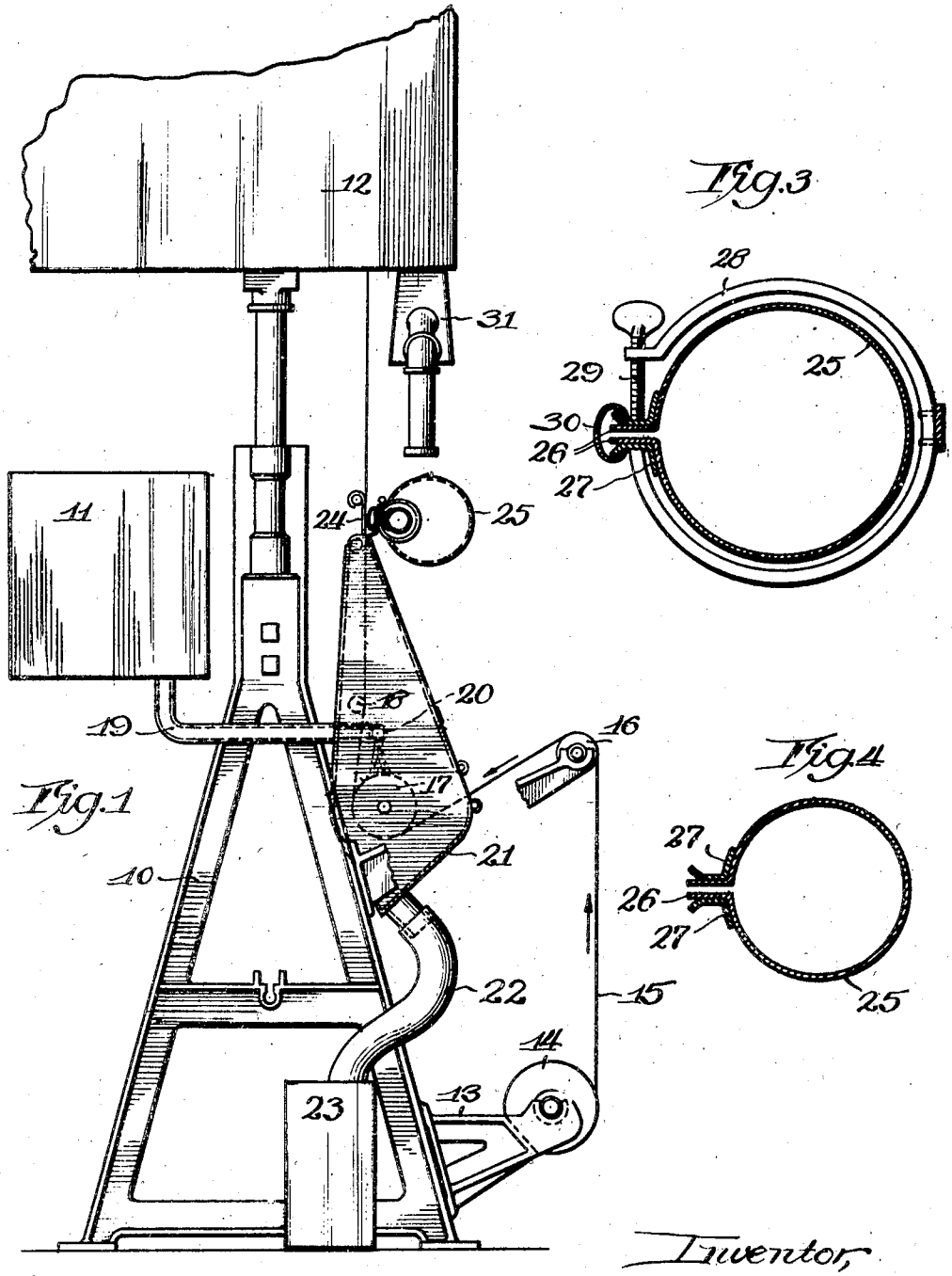


Fig. 1

Fig. 3

Fig. 4

Witness:
Chas. L. Louis

Inventor,
Harold J. Brunk
By George Bayer & Jones Atty.

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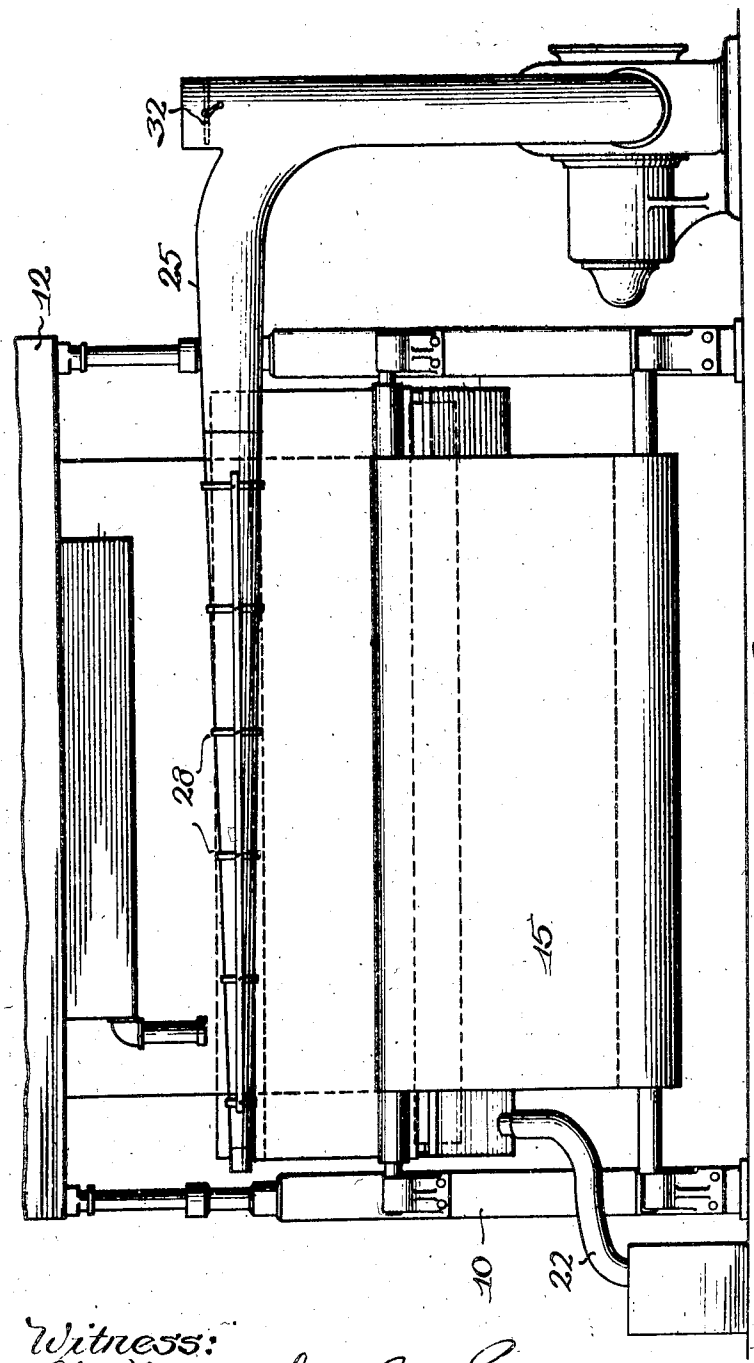


Fig. 2

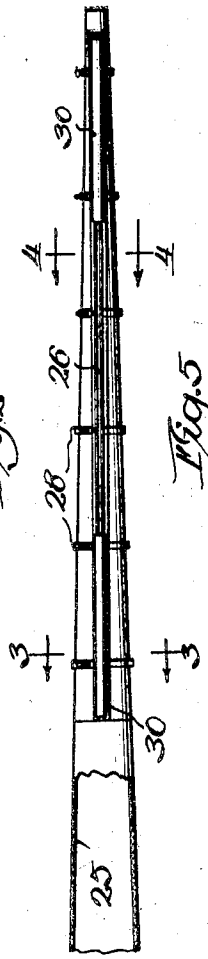


Fig. 5

Witness:
Chas. L. Fourse.

Inventor:
Harold J. Brunk,
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Patented June 29, 1926. 1,590,417

UNITED STATES PATENT OFFICE.

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MEANS FOR APPLYING A SENSITIZING COATING TO PAPER.

Application filed August 1, 1925. Serial No. 47,524.

My invention relates to improvements in means for applying coating to paper, or other fabric.

In the coating or sensitizing of paper or other fabric for photographic purposes, particularly blue-print and white-print papers, the solution is usually applied by drawing the material to be coated over a roller having the sensitized solution on its surface. Regardless of the particular method of distributing the solution over said material, however, it is always necessary to scrape the surplus solution from said surface. This is usually done by means of a glass scraper in the case of blue-print or white-print paper against which the paper is drawn. Various difficulties have been encountered, such as scuffing of the paper surface and abrasions, which cause streaks in papers like blueprints and white-prints; also the sizing material in the paper is, to a certain extent, removed from the paper. Such streaks and irregularities often appear to be of minor importance initially, but appear in greatly exaggerated form after the print has been developed. These difficulties, in the case of white-print paper, or blue line print paper, are so serious as to greatly curtail the use of this paper and to render the manufacture of it unprofitable.

The object of this invention is to overcome these difficulties by providing means for removing the surplus solution from the paper or other fabric without adversely affecting the finished product, and thus to render practical the use of white-print paper in particular, and, in general, to establish a uniform grade of excellence for sensitized fabric of this character.

This improvement is effected by blowing the surplus solution from the fabric by a thin sheet of air. In the form of the invention illustrated in the accompanying drawings, the air issues in a thin sheet from a horizontal slot in a tube and is directed substantially at right angles against the upwardly moving sheet of paper, a suitable backing being arranged behind said paper to maintain a fixed distance between the paper and the slot by preventing said paper from being blown away from said slot.

Fig. 1 is a side elevation of the apparatus.

Fig. 2 is an end elevation thereof.

Fig. 3 is a section on line 3—3, Fig. 5, and

Fig. 4 is a section on line 4—4, Fig. 5.

Fig. 5 is a front elevation of the air pipe.

The rear end of the apparatus includes a frame having end standards 10, which frame supports a jar 11 containing the sensitizing coating solution, a dry-box or heating chamber 12 being located at the upper part of said frame. Near the lower end of the standards is a pair of brackets 13 which support a roll of paper 14 of the desired grade or whatever material it is desired to coat.

The web of paper 15 passes upwardly as the roll is unwound, over a roller 16, which is preferably a brass roll, then around roll 17 which has a surface preferably of hard rubber, said roll rotating in a direction the reverse of the movement of the paper, as indicated by the arrows. From this roll the paper passes upwardly past roller 18 into the drying chamber 12. The coating solution of fluid is fed to the coating roll 17 through a suitable hose 19 connecting with a pipe 20 having openings therein through which the solution descends onto the roller, a certain quantity of it being retained between the roller and the web of paper as the latter is leaving said roll. The surplus drains into the lower part of the enclosure 21 and flows through hose 22 to the jar 23. The web of paper after issuing from a narrow slot in the upper end of the enclosure 21 slides over a fixed support 24 consisting preferably of a sheet of copper against which the paper is pressed by the sheet of air blowing against it at this point.

The air issues from a longitudinal opening in a tube 25 which is preferably tapered, having its larger end connected to a blower or other suitable source of supply, and having its smaller end closed.

As shown in Figs. 3 and 4, the opening in the tube is formed by extending the metal of the tube outwardly as a pair of parallel lips 26 with a small clearance between them. Stiffening members 27 of heavier metal are preferably secured to the lips and to the adjacent surface of the tube by soldering, or otherwise, and the size of the clearance or slot is regulated by means of a clamping

band 28 having a thumb-nut 29, whereby said lips may be brought closer together or may be permitted to spring apart.

By means of the taper in the tube, the drop in pressure may be compensated for so that a substantially uniform volume of air may issue from the slot at substantially all points thereof. Since the supply roll 14 may be of various different lengths, it is preferable to control the length of the slot in accordance with the width of the paper, and for this purpose, I provide shields 30, preferably in the form of elongated sheet metal clips, which may be slipped over the lips 26 near opposite ends of the slot, thereby obstructing the issuance of air and limiting the length of the slot to the distance between the inner ends of said clips. By sliding said clips back and forth the effective length of the slot may thus be varied.

With the arrangement described, the compressed air issues from the slot in a thin sheet which effectively removes the surplus coating, after which the paper, in its further ascent, is dried in the heating chamber, the latter being heated by any suitable source, such as a gas heater 31. The enclosure 21 is made preferably of copper, and serves also as an air shield completely enclosing the paper, as it is being coated, from the time it enters the enclosure through a small slot at the rear thereof until it reaches the small slot at the top thereof, thus keeping the air from coming in contact with the solution and evaporating the water from it.

The use of the apparatus described, completely eliminates the trouble previously encountered, the resulting coated paper being free from scuffing or abrasions, which result in streaks in the finished print. The deposited solution is kept on the surface of the paper and is not rubbed unevenly into it, said solution is evenly deposited over the entire surface as the air stream equalizes the solution, and, furthermore, the deposit is perfectly clean and free from floating particles of sediment, etc., as the air stream floats these particles down, whereas the scraper would rub them into the surface. In addition, the amount of solution left on the surface of the paper may be controlled to a nicety by means of the adjustable air slot and the regulation of the pressure at the slot, or else at the source by a by-pass 32.

Instead of feeding the solution from the jar 11 to the pipe 20, it may be circulated by means of a small pump from the jar 23 to said pipe, and the jar 11 omitted. Various other changes may be made in the apparatus without departing from the spirit of the invention. Whereas the sensitizing solution applied by coating machines is usually applied to paper, it has also been the practice to apply it to cloth and other fabrics, and therefore I do not intend to limit myself to paper where this term appears in the appended claims, but wish such term to be understood as indicating any suitable material.

What I claim new is:

1. Apparatus for coating paper and the like, comprising rotatable means for applying a solution to the paper, means for causing said paper to travel past said solution applying means, means for blowing air against said solution coated paper, said means comprising an air discharge member adapted to distribute air across the width of said paper with substantially uniform pressure, and a backing for said paper for supporting the entire rear surface thereof adjacent the region where said air strikes it.

2. Apparatus for coating paper and the like, comprising rotatable means for applying a solution to the paper, means for causing said paper to travel past said solution applying means, means for blowing air against said solution coated paper to remove the surplus solution therefrom, and a backing for said paper supporting the entire rear surface thereof adjacent the region where said air strikes it.

3. A device of the class described comprising a frame having a support for a roll of paper and the like thereon, a coating roller also supported thereon, a source of sensitizing solution, a pipe connected with said source having openings therein for discharging said solution upon said roller, means for drawing said paper from said supply roll past said coating roller, a conduit having an adjustable slot therein arranged to direct a thin sheet of air against said paper after the sensitizing solution is applied thereto, and a fixed support behind said paper past which the latter slides as the air is being directed against the same, thereby holding said paper at a definite distance from said slot.

4. A machine for coating paper and the like with a sensitizing solution comprising a solution applying means, pneumatic means for removing the surplus solution from the paper comprising a conduit with a tapered extension and a slot therein, means for varying the length of said slot, and means for varying the width of said slot.

5. A device of the class described comprising a frame having a support for a roll of paper and the like thereon, a coating roller also supported thereon, a source of sensitizing solution, a pipe connected with said source having openings therein for discharging said solution upon said roller, means for drawing said paper from said supply roller past said coating roller, means for rotating said coating roller in a direction the reverse of the movement of said paper past the same, a conduit having an adjustable slot therein arranged to direct a

thin sheet of air against said paper after the sensitizing solution is applied thereto, and a fixed support behind said paper past which the latter slides as the air is being directed against the same, thereby holding said paper at a definite distance from said slot.

6. In a device of the class described, a coating roller, means for drawing a strip of paper and the like past the same, means for enclosing said roller and paper during the coating, and means for blowing air against said paper above said enclosure to remove the surplus solution therefrom, said enclosure serving to prevent aeration of the solution on said paper adjacent said coating roller.

In testimony whereof, I have subscribed my name.

HAROLD J. BRUNK.