(No Model.)

C. A. DEAN & F. H. ROBIE.

MACHINE FOR ORNAMENTING PAPER.

No. 410,154. Patented Sept. 3, 1889.

Fig. 1.

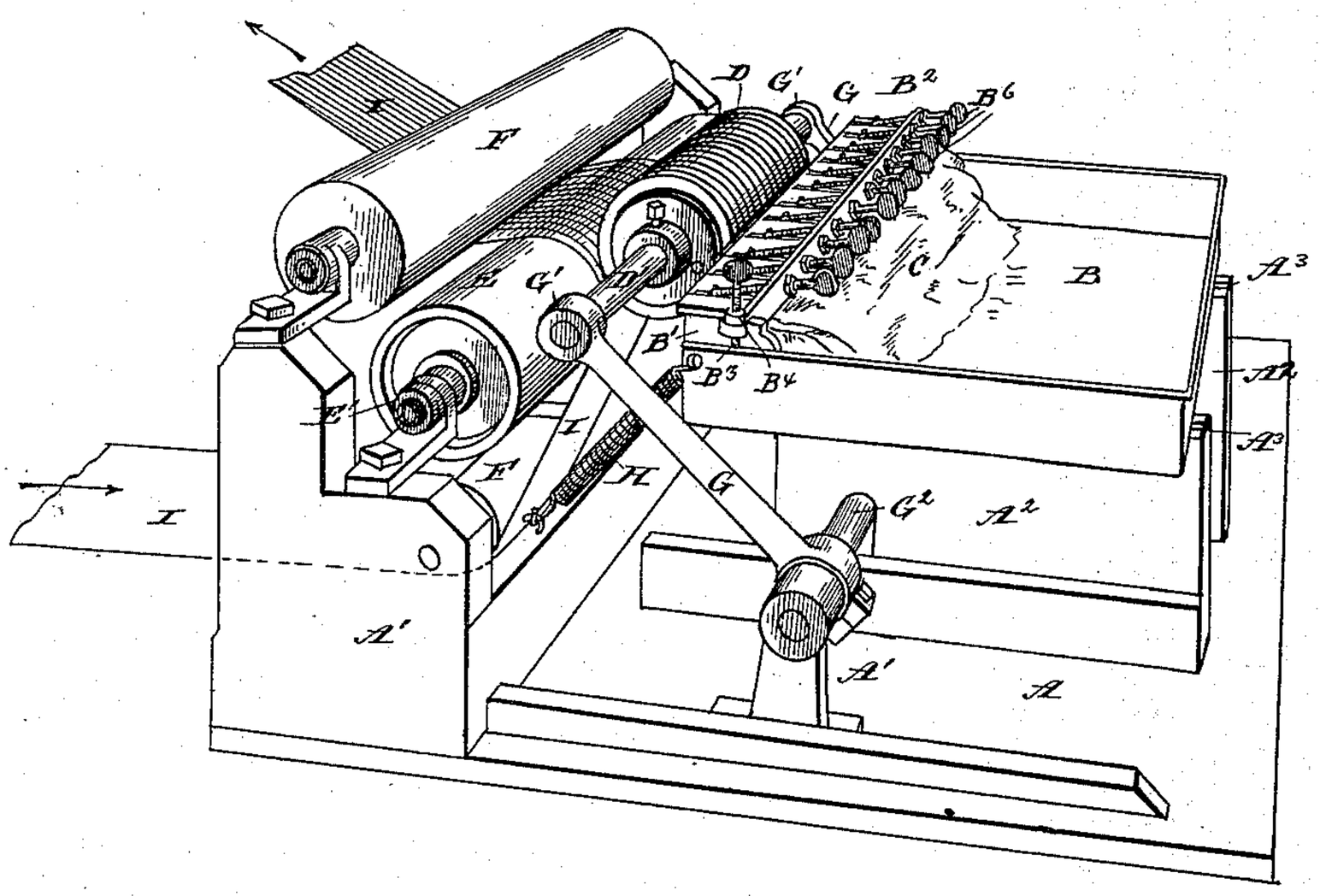


Fig. 2.

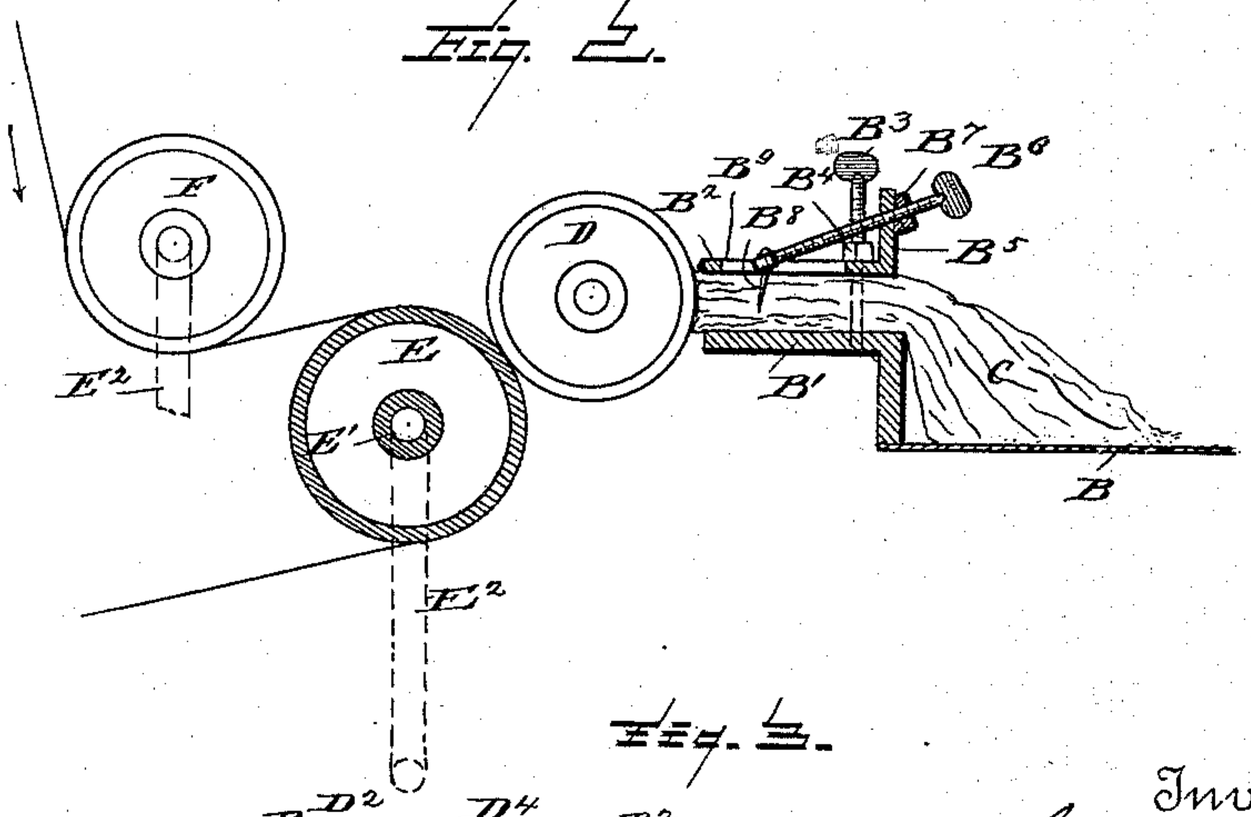
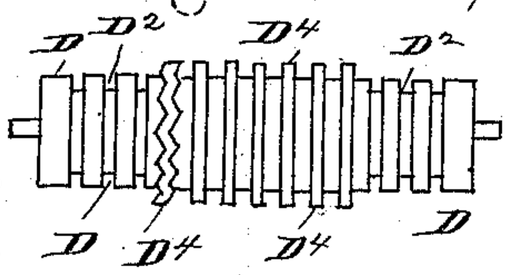


Fig. 3.



Witnesses:
L. C. Hills.
W. S. Duvall.

Inventors:
Chas. A. Dean and
Fremont H. Robie.
E. B. Stocking
Attorney.

UNITED STATES PATENT OFFICE.

CHARLES A. DEAN AND FREDERIC H. ROBIE, OF BOSTON, MASSACHUSETTS.

MACHINE FOR ORNAMENTING PAPER.

SPECIFICATION forming part of Letters Patent No. 410,154, dated September 3, 1889.

Application filed July 21, 1888. Serial No. 280,677. (No model.)

To all whom it may concern:

Be it known that we, CHARLES A. DEAN and FREDERIC H. ROBIE, citizens of the United States, residing at Boston, in the county of Suffolk, State of Massachusetts, have invented certain new and useful Improvements in Machines for Ornamenting Paper, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention has relation to mechanism for ornamenting paper, the ornamentation being in stripes or other design which is capable of being transferred to the paper from a roll.

The invention has particular reference to mechanism adapted to apply the design in what are known as "fluid inks," and among the objects in view are to provide means for utilizing capillary attraction in supplying the ink to the printing-roll and means for controlling the quantity of ink supplied.

The invention also aims to the provision of a printing-roll which can be adapted with the least possible labor for printing upon webs of differing widths.

Other objects and advantages of the invention will appear in the following description, and the novel features thereof will be particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a perspective of a paper-ornamenting machine constructed in accordance with our invention. Fig. 2 is a diagram in end elevation and partial section representing the relative location of the principal parts, and Fig. 3 is a side elevation of the printing-roll with one of the printing-rings removed.

Like letters of reference indicate like parts in all the figures of the drawings.

A represents a suitable foundation, from which risers A′ project and serve as or to support the bearings of the various rolls and shafts employed. Standards A^2 are provided, and are grooved or otherwise adapted on their upper edges, as at A^3, to receive ribs (not shown) which are formed on the under side of an ink-well B, so that said well may reciprocate along the standards A^2. At the delivery side of the ink-well B a bar or shelf B′ is formed, or it may be secured, and above and running parallel with said shelf there is a clamping-bar B^2, which may be connected with the shelf B′ by a screw or bolt B^3, passing through the clamp and shelf and provided with a set-nut B^4 for maintaining the parts in an adjusted position. A bolt B^3 may be employed at each end of the well, or, if desired, one end may be pivotally connected with the shelf B′.

Between the shelf B′ and the clamping-bar B^2 there is arranged a quantity of any suitable textile fabric, sponge, felt, or other suitable substance C which possesses the characteristic of conducting a liquid by capillary attraction. This capillary conductor is so arranged between the parts mentioned as to project slightly beyond the edge of the shelf and to rest within or partially within the well B.

The clamping-bar B^2 is provided along one edge with a vertical flange B^5, which is apertured for the reception of conductor adjusting-bolts B^6, threaded in said flange and each carrying a set-nut B^7. Each of the bolts is provided with a pin B^8, which passes through a slot B^9, formed transversely in the clamping-bar.

D represents the printing-roll, E the impression-roll, and F the guide-rolls employed in the machine. The shaft D′ of the printing-roll is mounted in bearings G′, formed in the ends of rock-arms G, which are clamped to a rock-shaft G^2, mounted in the standards A′, projecting from the base, one at each side thereof. This manner of mounting the printing-roll gives it a freedom of movement bodily to conform with the variations in the thickness of a web which is to be striped, printed, or otherwise ornamented thereby.

The printing-roll consists of a body D of any suitable material, preferably of wood, in that it is not liable to rust. The body is circumferentially grooved, as at D^2, Fig. 3, for the reception of rubber printing-rings D^4, of a cross-sectional form which adapts them to fit the grooves D^2 and project beyond the surface of the body D, so as to constitute the printing devices or surfaces proper. These rings may be made plain or ornamental upon their printing-surfaces, as desired; or the printing-surfaces thereof may extend laterally in either or both directions to vary the design which they shall impress upon the pa-

per from a straight line to an ornamental design. Projecting the edges of the printing-rings may be made the means for producing zigzag or curved instead of straight stripes. The judgment and taste of the user are all that is required to vary the designs which the printing-rings may be constructed to impress, and we therefore do not limit our invention to the printing of any particular design.

The impression-roll E may be made of any suitable material, and, if desired, may be hollow and provided with hollow journals E′, through which steam may be introduced into the roll for the purpose of instantly or substantially drying the ink as soon as the impression is made by the printing-roll.

The dotted lines in Fig. 2 represent a steam-supply pipe arranged to conduct steam into the impression-roll E.

H represents a coiled spring connected at one end to a fixed part of the machine and at the other to the well B. A similar spring may be arranged at the opposite side of the well, or any other well-known mechanical device may be used instead, the purpose being to adjustably and yieldingly maintain the conductor C in contact with the printing-roll.

This being the construction of the machine, the operation will be readily understood. A web I of paper to be ornamented may be passed through the machine (as indicated by arrows)—that is, under the guide-roll F and over the impression and drying roll E, thence under the other guide-roll to any suitable mechanism for rewinding or manipulating the paper after it has been ornamented. While the paper is on the impression-roll the printing-roll bears upon the same by reason of its weight and the manner in which it is supported, and receives the supply of ink through the conductor and transfers the same to the paper, which remains in contact with the impression-roll for a sufficiently long time to become substantially dry. The control of the quantity of ink which may be conducted from the well to the printing-roll is secured by a greater or less compression of the clamping-bar, in that the material used as a conductor may be more or less compressed, so as to more or less freely conduct by capillary attraction ink from the well. Now, in case of a wearing away at the front edge of the conductor and at one point more than another, the imperfection in the ink-supply caused thereby may be instantly corrected by extending the material at that point alone through the medium of the proper adjusting-screw B^6, so that the remainder of the edge of the conductor is undisturbed, and in this manner a uniform supply of ink can be maintained. If it be desired to ornament a web of less width, it is only necessary to swing the printing-roll upwardly away from the impression-roll and remove therefrom one or more rings and return said roll to its working position. On the contrary, rings may be added to ornament webs of greater widths, and this change may be speedily and easily accomplished.

Having described our invention and its operation, what we claim is—

1. In a machine for ornamenting paper, a printing-roll comprising a body provided with circumferential grooves, and flexible printing-rings removably fitted in said grooves and projecting beyond the periphery of the body, substantially as described.

2. The combination, with the ink-well and printing-roll, of an ink-conductor of the character described, and compressing means located between the roll and well for compressing said ink-conductor, substantially as and for the purpose specified.

3. The combination, with the printing-roll and ink-well, of the capillary ink-conductor, the transverse bar extending across said conductor between the rolls and well, and means, as the screw-bolt B^4, for pressing said bar downward to compress the conductor, substantially as and for the purpose specified.

4. The combination, with an ink-well, of a conductor of the character described, a slotted clamp, and adjusting-bolts having pins, substantially as specified.

5. The combination of an ink-well, a textile conductor, a printing-roll arranged adjacent to the conductor, and means for adjustably arranging the edge of the conductor at different points along the roll, substantially as specified.

6. The combination of an ink-well, a rotatable printing-roll, and a conductor of the material specified, arranged with one end in the well and the other in contact with the roll, substantially as shown and described.

7. The combination of an ink-well, an impression-roll, a capillary ink-conductor, and a printing-roll mounted in rock-arms, substantially as specified.

8. The combination of an ink-well adapted to contain liquid ink, a conductor arranged therein and projecting therefrom, a printing-roll arranged adjacent to the conductor, and a hollow steam-heated impression-roll, substantially as specified.

9. In a machine of the class described, a movable ink-well, and means, as the spring H, connecting the well with the frame, for maintaining the same in operative contact with the printing-roll thereof, substantially as specified.

In testimony whereof we affix our signatures in presence of two witnesses.

CHAS. A. DEAN.
FREDERIC H. ROBIE.

Witnesses:
W. B. FRENCH,
ARTHUR P. FRENCH.