

I. & M. I. ELLIS.
PROCESS OF COLORING, EMBELLISHING, AND DISCHARGING COLOR IN
THE MANUFACTURE OF PAPER.

Patented Nov. 10, 1885.

A schematic diagram of a mechanical system. At the top is a large rectangular block labeled *I*. Below it, a vertical rod labeled *J* passes through a horizontal block labeled *H*. A gear labeled *F* is mounted on the rod *J* and is in contact with a piston labeled *K*. The piston *K* is connected to a rod labeled *L* that extends downwards. A label *f* points to the gear teeth.

A black and white photograph of a rectangular piece of paper with a grid of small, dark, rectangular marks arranged in rows and columns. The marks are evenly spaced and appear to be printed or stamped. The paper is set against a dark background.

2. Blanta
Kilware

Isaac Ellis
Melvin J. Ellis
By J. B. Adams
Attorney.

UNITED STATES PATENT OFFICE.

ISAAC ELLIS AND MELVIN I. ELLIS, OF NORWOOD, MASSACHUSETTS.

PROCESS OF COLORING, EMBELLISHING, AND DISCHARGING COLOR IN THE MANUFACTURE OF PAPER.

SPECIFICATION forming part of Letters Patent No. 330,215, dated November 10, 1885.

Application filed July 31, 1885. Serial No. 173,193. (No model.)

To all whom it may concern:

Be it known that we, ISAAC ELLIS and MELVIN I. ELLIS, citizens of the United States, residing at Norwood, in the county of Norfolk and State of Massachusetts, have invented a new and Improved Process of Coloring, Embellishing, and Discharging Color in the Manufacture of Paper, of which the following is a specification.

10 The object of our invention is to print or color in various designs upon paper in the process of manufacture, or, if desired, where colored paper is being made, to remove a portion of the color in the same so as to
15 leave a design in white upon said paper.

In carrying out our invention we employ a roller with the desired design engraved in relief on its periphery and running in a tank to which color or any suitable chemical is
20 supplied from a reservoir, the colored substance being kept at the proper height in the tank by any suitable means, and the said tank and roller being placed in any desired position between the "coucher" and the
25 "calender-rollers" on the paper-making machine.

Referring to the accompanying drawings, Figure 1 represents a portion of a paper-making machine embodying our invention.
30 Fig. 2 is a vertical longitudinal section through the feeding-tank and reservoir, showing the printing-roller and other parts in elevation. Fig. 3 is a vertical cross-section taken on line *xx* of Fig. 2. Fig. 4 represents
35 a piece of paper as it would be if printed with a roller engraved with a design like that shown in Figs. 2 and 3.

A represents the frame of a paper-making machine; B, the couching-roller; C C, presses;
40 D D, driers, and E the calendering-rolls. In any suitable position between the coucher and the calender-rolls, but preferably between the presses and driers, we place a coloring or printing roll, F, mounted in suitable standards or bearings, G, so as to be
45 free to rotate in a tank, H, that is supplied with any desirable coloring-matter from a reservoir, I, the said coloring-matter being kept at a proper level in the tank H by means
50 of a ball-cock, K, or other suitable device. The tank H is fitted with an overflow, L, in case the ball-cock H should at any time get out of order.

The printing-roll F is engraved with any
55 desired design and caused to rotate by the

pressure of the paper as it passes from the guide-roller M, in front of the presses, to the guide-roller M', at the rear of the driers, the height of the liquid in the tank H being such that only the projecting portions of the roller
60 will dip into it, which, being thus covered with coloring-matter, transfer it to the paper passing over the roller.

When colored paper is being manufactured, and it is desired to have a design formed
65 thereon by discharging the color, a suitable chemical preparation is placed in the tank, instead of a colored solution, which, being brought into contact with the paper by the design on the roller F, will cause the color to
70 be discharged therefrom, and thus form the design upon the paper as it passes over the roller.

When very thick coloring-matter is employed—such as printing-ink—it may be
75 found advantageous to employ a small roller over the center of the roller F to press the paper onto the same, such roller not being shown in the drawings, as it will not be required when printing with ordinary color.
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If desired to have a design with more than one color, two or more rollers F may be employed, each running in a tank containing different color.

What we claim as our invention is—

1. The herein-described process of imparting a design to paper after it passes from the coucher and before it arrives at the calender-rolls in the process of manufacture, substantially as described.
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2. In a paper-making machine, the roller F, engraved with any desired design and running in a tank, H, in which coloring fluid is kept at a proper level, the same being placed between the coucher and calender-rolls, substantially as shown and described.
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3. The combination of the roller F, tank H, reservoir I, supply-pipe J, and a ball-cock, K, in a paper-making machine, for imparting designs to the paper as it passes from
100 the coucher B to the calender-rolls E in the process of manufacture, substantially as described and shown.

In testimony whereof we have signed our names to this specification in the presence of
105 two subscribing witnesses.

Witnesses:

J. H. ADAMS,
E. PLANTA.

ISAAC ELLIS.
MELVIN I. ELLIS.