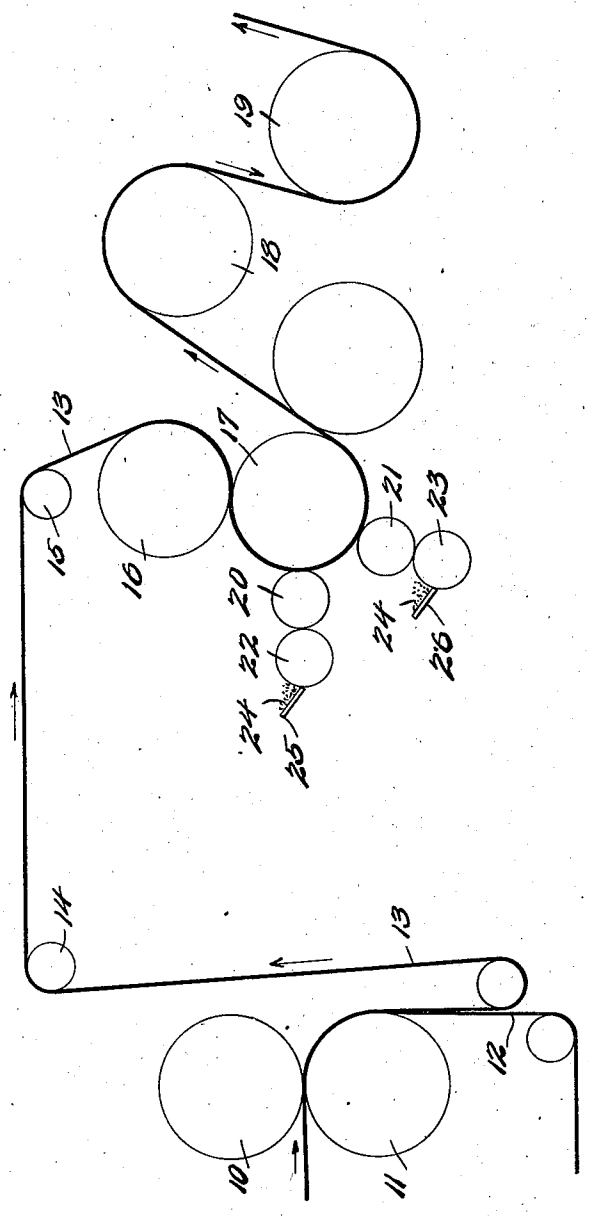
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D. A. SMITH ET AL

DECORATED PAPER AND METHOD OF MAKING SAME

Filed July 14, 1925



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UNITED STATES PATENT OFFICE.

DANIEL A. SMITH, OF CHEVY CHASE, MARYLAND, AND CHARLES P. STIRLING, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNORS TO DISTRICT OF COLUMBIA PAPER MANUFACTURING COMPANY, OF WASHINGTON, DISTRICT OF COLUMBIA, A CORPORATION OF VIRGINIA.

DECORATED PAPER AND METHOD OF MAKING SAME.

Application filed July 14, 1925. Serial No. 43,514.

The invention relates to the manufacture of printed decorated paper.

One of the objects of the invention is the production of decorative patterns or designs on paper by printing and in which there will be a wide range of color multitones and in which the decorations will be uniform in repetition of design and color intensities.

A further object of the invention relates to the production of printed decorated paper, while the paper is still in the making and passing through the paper making machine.

The invention is preferably practiced by employing in a paper making machine a printing attachment comprising an etched or intaglio-engraved cylinder, in connection with an offset roll having a resilient surface, to which the color or ink from the etched or engraved cylinder is transferred; from the transfer roll, the ink is applied to the wet paper sheet during its passage through the paper making machine.

Printing directly on calendered paper from an engraved design cylinder is well-known in the art. It has been found however that printing by direct contact of the wet paper sheet with an engraved design cylinder will not produce uniform or satisfactory results, but an uneven spotty deposit of color, due to the roughness and unevenness of the paper sheet.

In the invention the printing contact is between the plain resilient surface of the transfer roll and the wet pressed sheet, and thereby it is possible to deposit the color uniformly all over the paper sheet regardless of its rough or uneven surface.

Referring to the drawing, there are illustrated diagrammatically portions of a paper making machine to which has been applied the specific printing attachment for the purpose of carrying out the invention.

The drawing shows press rolls 10 and 11, which convey the felt 12 of a paper making machine, and which carries the paper sheet 13 from the sheet forming portion of the machine. The sheet 13 passes over guide rolls 14 and 15 to the press rolls 16 and 17, from which it passes to the driers 18 and 19.

When the paper sheet passes around the press roll 17, it is brought into contact with the transfer rolls 20 and 21, formed of resilient material, well known in the printing art, or surfaced with resilient material, such as rubber. These transfer rolls carry the ink or color designs received from the design rolls 22 and 23. The design rolls may be formed in any suitable manner, but it has been found that etched or intaglio engraved cylinders of metal produce the most satisfactory results. It will be understood that the rolls 22 and 23 are formed with depressions constituting pockets for the reception of ink or color in just sufficient quantity to produce the required effects upon the paper, and that these depressions vary in depth.

Ink or water color 24 is supplied to the design rolls and wiped by the doctors 25 and 26, as is usual in intaglio printing machines. It has been found that water colors or water inks can be successfully used with this invention. The sheet being wet has a tendency to absorb water color readily, producing very soft and striking effects.

An accurate control of the color supply is obtained by the extent of the depressions in the intaglio cylinder and by the variations in the depth thereof. The depth of the depressions controls the quantity of color. The contact between the metal design cylinder and the resilient surface of the transfer roll produces a complete transference of the color to the transfer roll and at the same time a slight spreading or distribution of the color upon the transfer roll. When the transfer roll comes into contact with the wet paper, the color is completely absorbed by the paper, the two surfaces being jointly sufficiently resilient and compressible to cause contact to be established at every point and all of the color to be transferred from the plain resilient surface of the transfer roll to the wet paper sheet. The wet condition of the paper insures complete absorption of the color by the paper. In this second transfer of color, there is a further slight spreading or distribution of the color.

What is claimed is:—

1. A process of making decorated paper by printing, comprising forming a sheet and removing the excess water therefrom, printing upon the wet sheet by means of a roll

having a resilient surface and receiving its ink or color design from an engraved metal design cylinder, and subsequently drying the sheet.

2. A process of making decorated paper by printing a design upon the paper while wet, by the use of an intaglio engraved cylinder and an offset roll having a resilient surface, the decorative design being transferred from the engraved cylinder to the offset roll and then to the wet paper sheet.

3. A process of making decorated paper by printing, comprising forming a sheet and removing the excess water therefrom, printing upon the wet sheet by means of a roll having a resilient surface and receiving its design in water color or water ink from an intaglio engraved cylinder, and drying the sheet.

4. A decorated paper having a rough surface and having printed thereon uniform designs, free from uneven spotty deposits of color, by means of an intaglio engraved cylinder and an offset roll having a resilient surface, the said designs being transferred from the engraved roll to the offset roll and then to the rough surface of the paper.

5. A decorated paper having a rough surface and having printed thereon uniform designs of blotches of contrasting colors in a wide range of multitones, free from uneven spotty deposits of color, by means of an intaglio engraved cylinder and an offset roll having a resilient surface, the said designs being transferred from the engraved roll to the offset roll and then to the rough surface of the paper.

In testimony whereof we affix our signatures.

DANIEL A. SMITH.
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