(No Model.) 2 Sheets—Sheet 1.

H. F. CASE.

PROCESS OF AND MACHINE FOR SIZING OR COLORING PAPER.

No. 305,424. Patented Sept. 23, 1884.

Fig 1

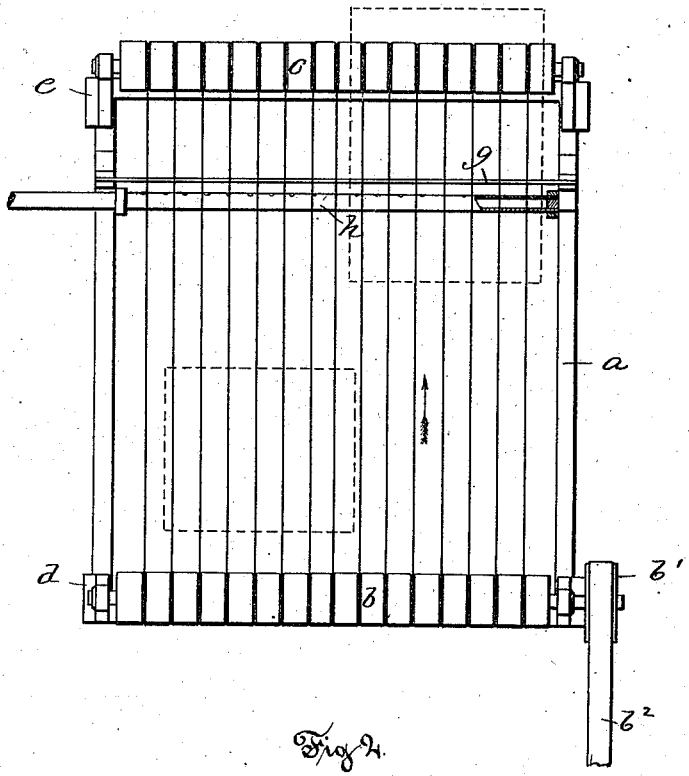
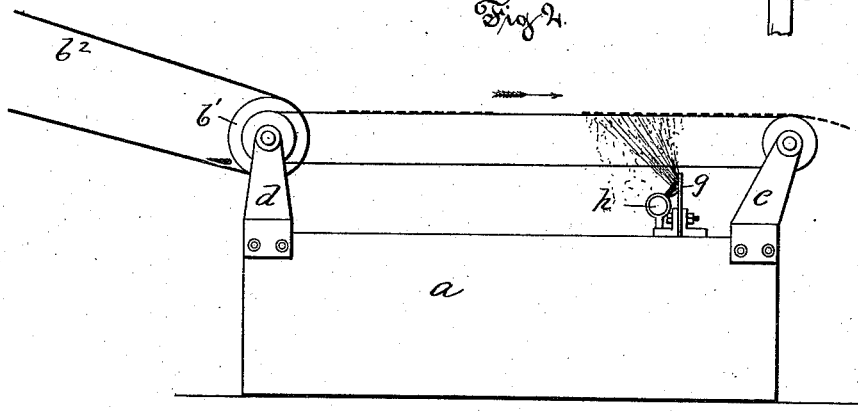


Fig 2.



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(No Model.) 2 Sheets—Sheet 2.

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Fig 3.

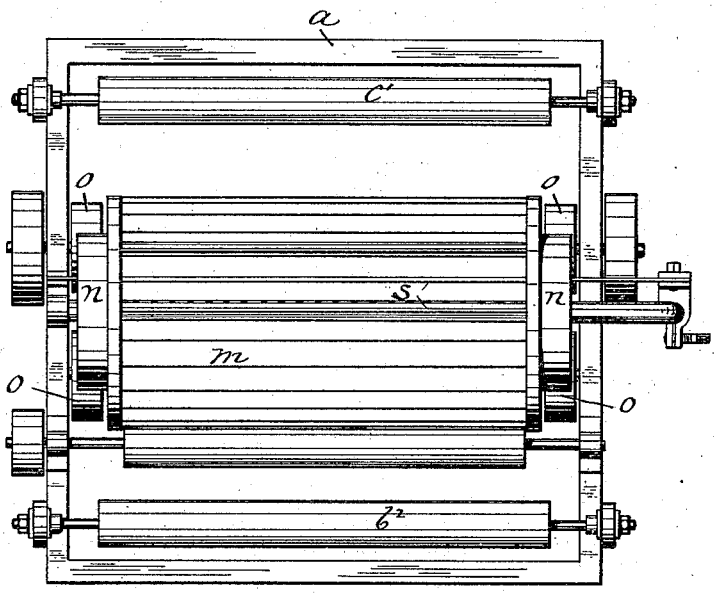


Fig 4

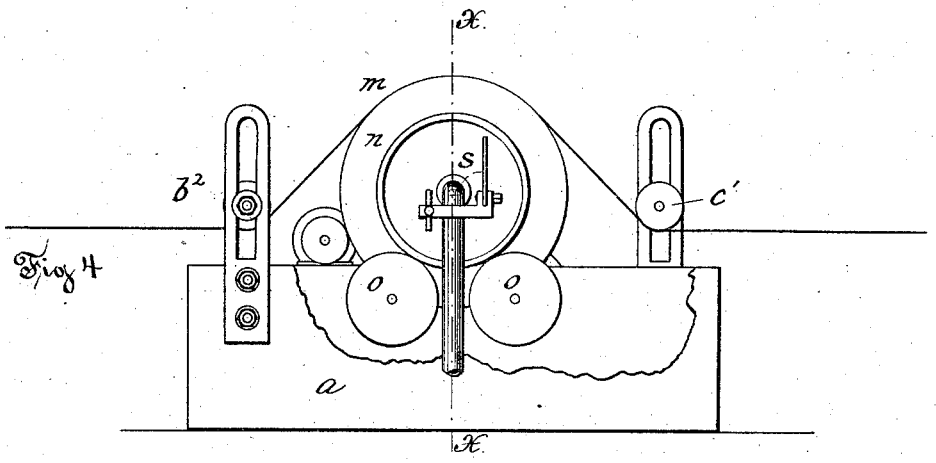
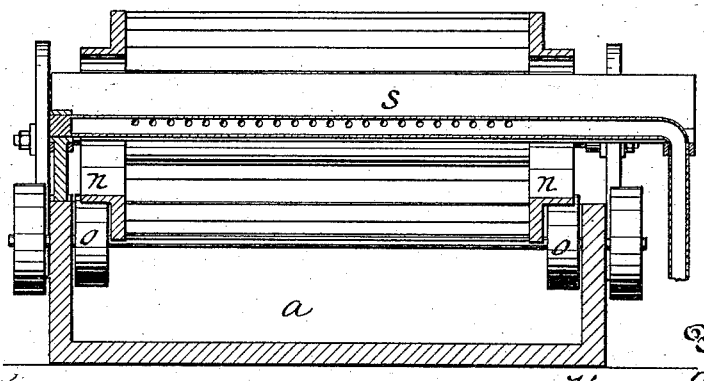


Fig 5.



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PROCESS OF AND MACHINE FOR SIZING OR COLORING PAPER.

SPECIFICATION forming part of Letters Patent No. 305,424, dated September 23, 1884.

Application filed January 28, 1884. (No model.)

To all whom it may concern:

Be it known that I, HENRY F. CASE, of South Manchester, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in the Process of and Machines for Sizing or Coloring Paper, of which the following is a description, reference being had to the accompanying drawings, where—

Figure 1 is a top view of my device with parts cut away to show details. Fig. 2 is a side view of the same. Fig. 3 is a top view of an alternate form of my device. Fig. 4 is an end view of the alternate form with parts shown in section. Fig. 5 is a view in horizontal longitudinal section of same on plane denoted by line *x x* of Fig. 3.

My invention is adapted for use as part of a paper-making machine, or as a separate machine; and it has for its object the coating of the surface of paper, cloth, or the like with color, sizing, starch, or similar material, applied in a liquid form in a spray, in the method hereinafter more fully described.

It consists in the combination of parts for and the method of applying the desired coating upon the material, which may be in sheets or continuous lengths.

In the accompanying drawings, the letter *a* denotes a tank of suitable material, as wood; *b* and *c*, rollers rotarily arranged in suitable bearings, *d e*, upon the upper edge of the tank, and having corresponding transverse grooves at regular intervals, in which belts of suitable material—as wire—are arranged to form a sort of endless apron, moved in the direction of the overlying arrow by means of pulley *b'*, fast to shaft of roller *b*, and the driving-belt b^2, from any suitable shaft or pulley. Near one end of the tank a thin plate of metal, *g*, is secured edgewise across the tank from side to side in a vertical plane. Just in front of this plate a metallic tube, *h*, perforated on the side toward the plate, is also secured transversely of the tank. This tube is a continuation of the discharge-pipe of a force-pump, which pumps the liquid from a vat in which the sizing, color, or starch is stored in solution, and forces it into the pipe *h*, which is closed at the extreme end. When the pump is in operation, the liquid is thrown forcibly against the plate in a direction to rebound upward in a dense spray upon the sheets of paper or paper-board, which are spread upon the apron at one end, as at roller *b*, and carried by the movement of the apron over the spray and to roller *c*, where they are removed. The superfluous liquid falls into the tank, from which it runs back, through a waste-pipe, to the main vat.

In order to operate upon a continuous roll or length of paper or cloth, I use an alternate form of my device, which consists of the tank *a*, the rollers *b'' c'*, secured transversely of the tank upon standards, in which they are vertically adjustable, and the spraying device arranged axially within a cylinder, *m*, having the open flanged heads *n*, which bear upon friction-rolls *o*, rotarily secured to the sides of the tank. The surface of the cylinder is formed of wire-net in comparatively large meshes, and the paper passes under roller b^2, over the cylinder *m*, and out under roller *c'*, receiving a coating of size, starch, or color as it passes over the spraying device *s*, which operates as already described. The degree of contact of the cylinder and paper is regulated by raising or lowering the guide-rolls in their standards.

It is very difficult to color pulp for heavy board (and, in fact, any coarse stock) in the engine with any degree of uniformity; but by my device a perfectly uniform tint is obtained over the whole surface of the paper or board, however coarse or mixed the stock. It is thus treated when dry and without any soaking or materially wetting the material.

Although especially adapted to paper, my method of sizing, starching, or coloring, and, in fact, treating or coating with any desired substance that may be used with liquids as a vehicle, is applicable to other material, as textile fabrics, knitted fabrics, and the like, and for all such I desire to claim it.

It is obvious that by forming patterns in the surface of the cylinder or apron color may be deposited upon any material borne across the path of the spray.

I claim as my invention—

1. The method of applying color, size, starch, or the like to paper or other fabrics by forcing them in solution against a plate,

from which they rebound in spray against the fabric, all substantially as described.

2. In a device for applying color, size, or other matter in solution to paper or other fabrics in sheets, a perforated tube, a plate, and a force-pump, or similar means for forcibly projecting the color in solution and spray against the plate and paper, all substantially as described.

3. The process of applying matters in solution to surfaces, consisting in projecting the solution against the surfaces in a spray and removing the surplus by gravity, all substantially as described, and for the purpose set forth.

HENRY F. CASE.

Witnesses:
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W. H. MARSH.