

United States Patent Office.

JOHN C. CROSMAN, OF BOSTON, MASSACHUSETTS.

Letters Patent No. 62,256, dated February 19, 1867.

IMPROVED PROCESS OF COATING SHEETS OF PAPER AND OTHER MATERIAL WITH SOLUTIONS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, JOHN C. CROSMAN, of Boston, in the county of Suffolk, and State of Massachusetts, have invented an Improved Process for Coating Sheets of Various Materials with Solutions of Chemical Salts, or with other fluid substances or compounds; and I do hereby declare that the following is a description of my invention sufficient to enable those skilled in the art to practise it.

My invention relates to a process by which sheets of various material, such as leather, cloth, paper, &c., are covered by a coating applied in the form of a fluid, or a fluid solution, in such a manner that the resulting coating will be smooth and of uniform thickness, and so that when the solution applied contains chemical salts these will be equally distributed over the surface which is so covered. Said process consists in first thoroughly moistening or saturating a sheet which is to be coated, which I do preferably by immersion in suitable fluid, which may be cold or heated, according as one or the other condition is best adapted to produce the desired effect; then, in depositing the dampened sheet on a level table, and by suitable manipulation causing the sheet on its under side to come into contact with the upper surface of the table, by expressing air and any free fluid from between the sheet and table; and also, where found necessary, removing superfluous fluid from the upper surface of the sheet, by application thereunto of bibulous paper, or other suitable absorber or remover; and finally, in applying to the upper surface of the sheet, when in the condition produced by the second operation, a fluid material, or a fluid solution of the material or of the mixture, with which the said surface is to be coated. In practice the level table top should be made of substances not changeable in form on the application of fluid, and glass, slate, marble, or metal may be used, though I prefer glass.

In applying the solution, which, upon drying, forms the desired coating of the sheet, and where the solution is of such a nature that but a small quantity will leave or deposit the requisite coating, I proceed in the manner of water-color artists when laying broad washes of flat tints. But when a considerable quantity or depth of fluid is required to make the desired coating, I then make use of such a frame as paper-makers term a deckle, (the bottom of which may be faced with rubber,) placing it on the top of the table around the paper, the edges of which the inside of the frame nearly touches. I then pour on the paper a suitable quantity of solution, which gravitates into uniform depth on the paper, it being prevented from flowing off from the paper by the deckle. In some cases the distribution of solution may be aided by the operator's use of a brush.

In applying the solution use may be made of a reservoir, caused to traverse over the table, and delivering the solution uniformly over the breadth of the sheet while so passing; and, if desired, the solution may be made to flow into or upon a brush attached to said reservoir, and coming into contact with the sheet, while the amount of the solution delivered may be made to depend upon a suitable valvular arrangement, and the speed with which the reservoir is moved. With this reservoir may be employed the deckle, especially if considerable depth of solution is to be left upon the surface of the sheet.

While this process was devised by me with reference to the preparation of paper for use by photographers, I do not by any means consider it as limited to such use, as sheets of material may be coated in the manner described with alcoholic, aqueous, alkaline, or acid solutions, or with fused resins, oils, varnishes, or paints. But care must be taken to have the fluid, with which the sheet is saturated, one with which the covering or coating solution or fluid has an affinity.

The object of thoroughly and uniformly saturating the sheets before applying them to the table is to cause them to lie flat thereupon, so that, if the sheet is of uniform thickness, there will be no valleys in which the deposit of coating matter will be thick, or hills on which it will be thin.

As one of the prominent objects for which my process will be used is the preparation of paper for use in photography, it may be well to briefly notice all of the processes known to me for coating such papers with gelatine or albumen. It has been floated on the surface of solutions of gelatine or albumen, and then hung up to dry. This makes the coating thin at one end of the sheet and thick at the other. It has been drawn over the surface of said solutions and then hung up to dry, but with the result just named. It has been floated, as before mentioned, and then placed with the coated side uppermost upon a flat disk, which an operator dexterously turns and tips in such a manner as to make the coating approximate to a uniform thickness. It has been made into a belt, arranged to pass over drums, so that the lower side of the paper would touch lightly the surface of the solution. And another method has been to first rub over a glass plate with gall, or with a mixture of nitric

acid and alcohol, and then to pour the coating solution upon the plate, and, before said solution became dry, the paper to be coated was gently pressed thereupon; and, when dry, or nearly so, the paper, with the coating adhering thereunto, was removed from the plate. But each of such processes has been attended with difficulties and serious objections, for it is extremely difficult, if not impossible, by either of them to cover paper or other sheets with a coating of uniform thickness; and if the coating used for photographic purposes is not of uniform thickness the tone of pictures taken thereupon cannot be uniform throughout. In my process, by thoroughly saturating or dampening the paper, and then laying it, as described, on a level table, the upper surface of the paper will necessarily be level, and the coating fluid poured thereupon will necessarily distribute itself by gravity uniformly in thickness over the surface.

I claim the described process for coating sheets of material with fluid substances or compounds.

JOHN C. CROSMAN.

Witnesses:

J. B. CROSBY,

FRANCIS GOULD.