

United States Patent Office.

CYRENIUS C. FITZGERALD, NEW YORK, N. Y.

Letters Patent No. 104,006, dated June 7, 1870.

IMPROVEMENT IN COLORING AND DRYING PAPER.

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, CYRENIUS C. FITZGERALD, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in the Process of Coloring Paper; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, and to the letters of reference marked thereon, which form a part of this specification.

The nature of my invention consists in a new mode or process of coloring paper of every quality, paste-board, *papier-maché*, wall-paper, wrapping, writing, ornamental papers, &c., in every shade and color, by passing it on and under the surface of a coloring solution, drying and rolling it in rolls ready for the market at the rate of from thirty to forty feet per minute, with the attention of two persons.

Color is ordinarily given to paper while in the pulp, or colored afterward by laying color on the paper, suspending it for several hours to dry, and then rolling it for market. This method has a great many objections, some of which are: the long time required to dry; it is not colored through, but simply receives a surface finish; the expense incurred being considerably more than my process; the liability of the running and lapping over the already-colored surfaces, making different shades on the surface where uniformity is desirable; paper-hangings, either cracked by folding, or torn, always exposing the white inner surface, renders the surface-colored paper inferior to a thorough colored mass; and numerous other objections of equal importance, while the economy in cost and time in my process produces equal or superior beauty, a completely colored mass applicable to every style of tint or fibrous formed paper, at about half the cost of the usual styles of manipulating the fine colors.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe the manner in which the same is or may be performed.

The paper is placed on a reel, and, by pulling the end, it readily uncoils. The end is passed between two feed-rollers or cylinders, which move so tightly against the paper as to carry it along. It is then passed under two coloring-cylinders, which are located with their lower surfaces in the coloring-matter to the depth of one-eighth of an inch. The coloring-matter is contained in a metal box of any size convenient for the dimensions of the paper required to be colored. The paper then rises and passes between two other cylinders, which work with equal velocity as the feed-rollers above mentioned. Then it passes over and un-

der three steam-heated cylinders, and then between two calendar cylinders; thence to a reel, where it is rolled up in a complete condition.

The paper is fed by the two first rollers, receives its color while under the next two, and partially dried by passing between the third set of rollers, and fully dried by the three steam-heated cylinders, which are of the same size as the third set of rollers, where the paper was partially dried. The paper is pressed smooth by the calendar-rollers, and wound to rolls on a reel.

The machine may be constructed in any suitable manner so as to conform to these requirements, and to let the paper pass through the different stages of preparation, as herein described.

The coloring-matter may be any suitable material, but I prefer to use what is known as aniline colors in solution, and I will here give the manner of preparing some of said colors:

To one gallon of alcohol, at ninety-five per cent., dissolve one-half ounce of the aniline color, and add the usual mordant used in dyeing cotton goods. This gives the colors generally desirable in paper. The colors may be varied by adding aniline in greater proportions, or lessened by diminishing the quantity.

For Nile green, the same solution as above, with one-half ounce picric acid in solution.

Animal color, or cochineal, say about four ounces finely pulverized cochineal, one ounce alum, one gallon alcohol, and four ounces gallic acid.

And in like manner any desired color and shade may be given to paper.

By my process the paper is dried perfectly without overlapping the colors, and obtains a uniform shade, and is rolled up at a speed of about thirty feet per minute.

Having thus fully described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. Drying colored paper by bringing it in contact with one or more heated surfaces, substantially as herein set forth.

2. The method herein described of coloring and drying paper by passing it under rollers or cylinders within the coloring solution, then between other rollers to become partially dried, and, lastly, over and under steam-heated cylinders, to be perfectly dried, substantially as herein set forth.

In testimony that I claim the foregoing as my own, I affix my signature in presence of two witnesses.

C. C. FITZGERALD.

Witnesses:

C. B. SMITH,
A. P. SMITH.