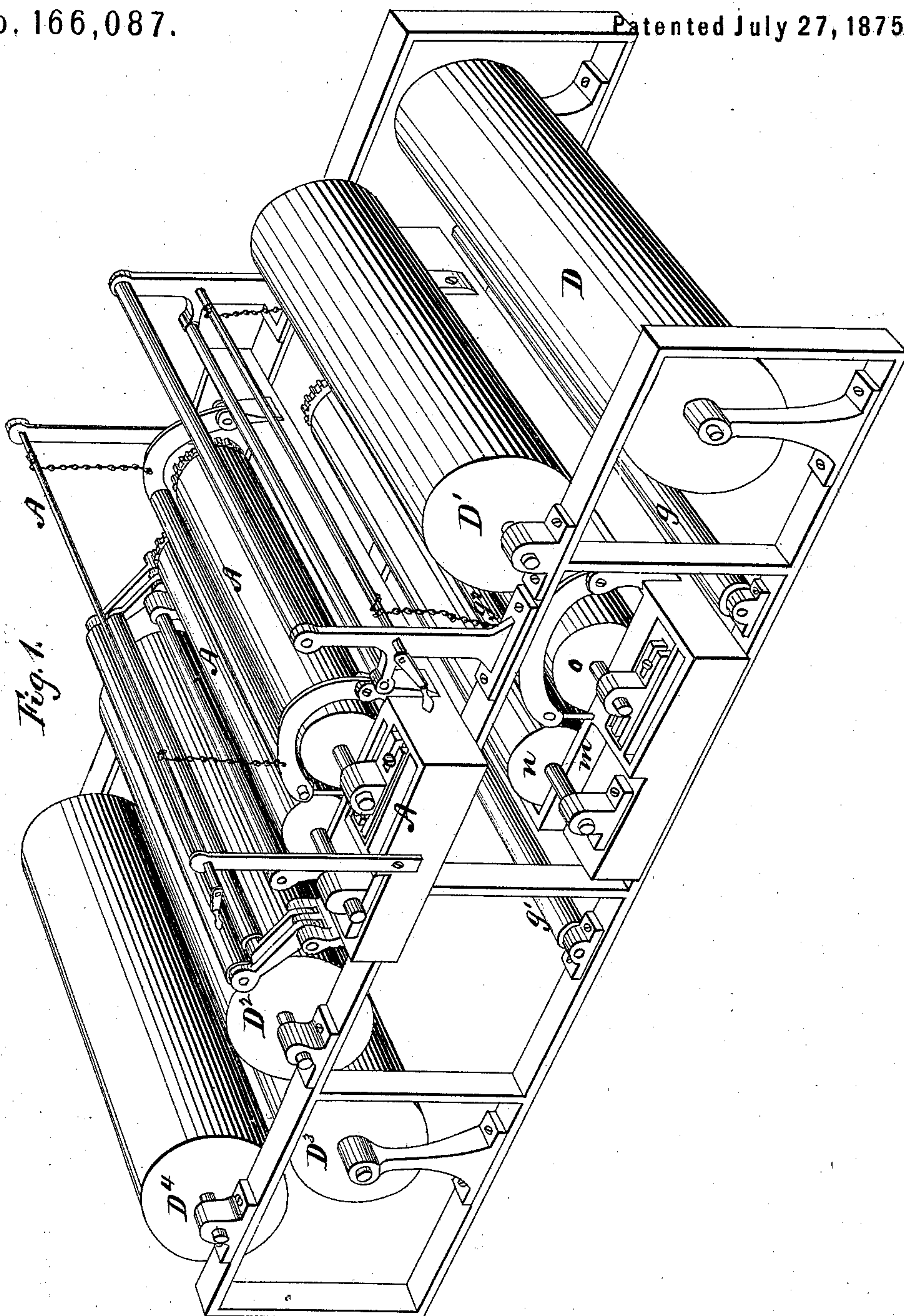


B. F. FIELD.

Manufacture of Lined Straw Board.

No. 166,087.

Patented July 27, 1875.



WITNESSES

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F. McKenny

INVENTOR

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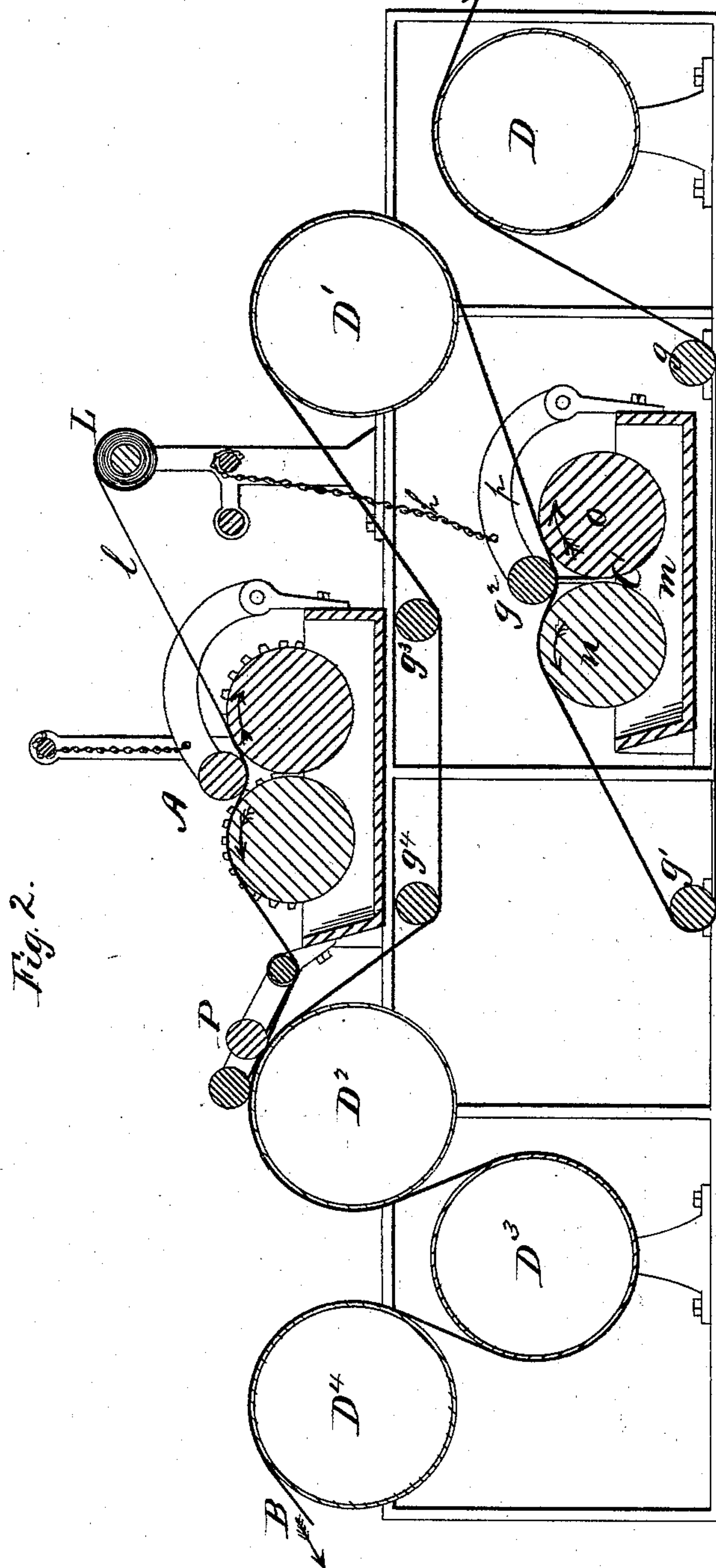
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2 Sheets--Sheet 2.

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UNITED STATES PATENT OFFICE.

BENJAMIN F. FIELD, OF FOND DU LAC, WISCONSIN.

IMPROVEMENT IN THE MANUFACTURE OF LINED STRAW-BOARD.

Specification forming part of Letters Patent No. 166,087, dated July 27, 1875; application filed June 8, 1875.

To all whom it may concern:

Be it known that I, BENJAMIN F. FIELD, of Fond du Lac, in the county of Fond du Lac and State of Wisconsin, have invented new and useful Improvements in the Manufacture of Lined Straw-Board; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings forming part of this specification, in which—

Figure 1 is a perspective view, representing a section of a straw-board machine having a lining apparatus and a coloring and smoothing apparatus attached; and Fig. 2 is a longitudinal vertical section of the same.

Similar letters of reference in the accompanying drawings denote the same parts.

In preparing straw-board for box making and other similar purposes, it is necessary that the board should have a comparatively smooth surface imparted to it, which surface must be of uniform color, white, grey, blue, or other shades differing from the natural color of the straw-board being generally preferred by the trade. Such colored surface is given to the board by lining it with white or tinted lining-paper of good quality, and, as heretofore applied, the lining-paper must be of considerable thickness in order to prevent the tawny color of the board from showing through, and the felt marks and other inequalities from plainly appearing. Such thick heavy lining-paper is comparatively expensive, and adds materially to the cost of producing good board for the purposes mentioned.

The object of this invention is to avoid the necessity and save the expense of using such thick heavy lining-paper, by enabling equally as good or better results to be reached by the use of the thinnest and lightest varieties of paper which heretofore could not be applied to the purpose of lining at all. To this end the invention consists, first, in a process or mode of surfacing straw-board and other thick dark-colored paper-board, to wit, by first coloring and smoothing the surface of such board, and then lining it over the coloring matter with thin paper; and it consists, secondly, in mechanism adapted to carry out such process, substantially as I will now proceed to set forth.

In the drawings, D D¹ D² D³ D⁴ are some of

the driers of an ordinary straw-board machine, over which the board, in the process of manufacture, passes in continuous lengths from right to left, as shown at B, in Fig. 2, being guided in its course by the driers acting conjointly with suitable guide-rolls g g^1 g^2 g^3 g^4 . L is the roll from which the lining-paper l is fed, said roll being provided with any suitable tension apparatus. A is the pasting mechanism which coats the under side of the sheet l with a thin film of paste, and P is the pressure-frame and rolls which unite the lining-paper to the straw-board. All these parts are of any suitable form and construction, such as are ordinarily employed for pasting thin lining-paper upon straw-board by machinery, and, preferably, such as are described in my Letters Patent dated January 6, 1874, No. 146,240. C is the coloring and smoothing apparatus by which I apply a coating of coloring matter to the board, and smooth it down thereon, after the board has been made and partially dried, and before it receives the lining-paper. This apparatus may be constructed in any suitable manner, although I prefer to use mechanism similar to the pasting mechanism A, namely, a suitable box, m , to contain the coloring paste or liquid; an adjustable gage-roll, n , driven by gearing in a direction opposite to the movement of the sheet, and at about the same velocity as the sheet; a color or paste-roll, o , driven by gearing slightly faster than the roll n , and in the opposite direction, for the purpose of smoothing and spreading the color-paste; and a guide-roll, g^2 , which properly directs the course of the sheet and keeps it in contact with both rolls n o . The guide-roll should be adjustable, and is, therefore, mounted on a hinged frame, p , one end of which is supported by the chain h ; but it should not press with its weight upon the straw-board, as it might cause it to part occasionally in weak places, or when not sufficiently dried, and, besides, it would squeeze out the paste so that the coloring would be imperfect.

The coloring apparatus may be arranged at any suitable place among the driers, where the straw-board will have become partially dried before reaching it, so as to be in a fit condition for receiving the coloring material;

but one or more driers should always operate between the coloring apparatus and the pasting apparatus, in order that the wet coloring dye or paste may be dried in before the lining-paper is applied. The direction of the straw-board is so changed by the drier D¹, or other equivalent means, that its colored side is presented to receive the lining-paper. A good coloring material may be obtained from a mixture of Georgia clay, twelve parts, and common glue, one part, or about in that proportion, with water enough to render the mixture about the consistence of paste, and with or without any pigment to color it. This mixture fills up the inequalities in the surface of the board, and to a great extent obliterates the felt-marks, and when dried by the roll or rolls D¹ adheres firmly to the board, forming a hard smooth base for the lining-paper. I do not limit myself, however, to this mixture, but may use any other that will be found to answer the purpose as well or better.

The coloring and pasting apparatus may be duplicated and applied to the coloring and lining of both sides of the board, if desired. It is not necessary for me here to describe suitable modifications for such purpose, as any mechanic skilled in the art will be able to accomplish it from his knowledge of the art, after becoming familiar with the operation of the mechanism above described.

The surface of the straw-board being thus prepared and colored preliminarily to the application of the lining-paper, the latter need not be of the fine quality heretofore necessary, but may be of the thinnest and lightest material, even tissue-paper being sufficient for the purpose. If the lining-paper is white,

coloring-paste should be employed, and whatever may be the tint of the lining-paper a similar tint should be given to the coloring-paste, as it shows through the thin paper.

Having thus described my invention, I claim as new—

1. The mode or process of finishing straw-board, and other coarse dark paper-boards, by coating or dyeing one or both surfaces with coloring material, and afterward lining such colored surface with thin lining-paper, substantially as and for the purposes set forth.

2. As an article of manufacture, straw-board, or other dark heavy paper or board, lined with thin paper, and having a coating or wash of coloring material, or coloring and smoothing material, applied between the lining and the board, substantially as described.

3. The combination of a straw-board machine with an apparatus for applying lining-paper, and an apparatus for coloring or sizing the surface of the board preparatory to the application of the lining-paper, substantially as described.

4. The combination of a straw-board machine, driers for partially drying the straw-board, a coloring apparatus for coloring the surface of the board, additional driers for drying in or hardening the coloring material, a lining apparatus, and, finally, other driers to dry the lining-paste, all operating in the order and for the purposes set forth.

Witness my hand at Washington, D. C., this 30th day of May, A. D. 1875.

BENJAMIN F. FIELD.

Witnesses:

H. A. HALL,
M. CHURCH.