

UNITED STATES PATENT OFFICE.

FRANCIS N. DAVIS, OF BELOIT, WISCONSIN.

IMPROVEMENT IN PAPERS FOR BUILDINGS.

Specification forming part of Letters Patent No. 117,155, dated July 18, 1871.

To all whom it may concern:

Be it known that I, FRANCIS N. DAVIS, of Beloit, in the county of Rock and State of Wisconsin, have invented a new and Improved Building-Paper; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention has for its object to provide an improved building-paper or board to be applied to the interior walls of buildings in place of plastering.

I am aware that thick board, made in continuous lengths from straw, has heretofore been employed for this purpose, either saturated or charged with tar, resin, oil, or oleaginous compounds; but it is objectionable for the following reasons: 1st, the employment of tar imparts a disagreeable odor to the straw board and renders its use upon the interior of buildings objectionable. 2d, the employment of oil, &c., discolors the board or paper to a great extent, and, owing to its greasy nature, precludes the use of paper-hangings after the board is applied. These various manufactures are, of course, highly inflammable, and, consequently, unsafe for use in light structures. I am also aware that straw board in continuous lengths has been treated with silicate to render it fire-proof; but, while it accomplishes this result, it does not make it impervious to dampness. When applied therefore to the interior of buildings it is liable to swell and contract under the varying influence of the weather to such an extent as to destroy its uniform appearance, causing it to crack and scale off.

My invention, to obviate these difficulties, consists in treating the board, as it leaves the paper-machine in continuous lengths, with such materials as shall render it fire-proof and impervious to dampness, and at the same time finish its surface without discoloration.

In carrying out my invention the web of straw-pulp is conducted first to one series of drying-rolls, which is heated by steam, and is by it partially dried and hardened. From these driers it passes under a roller, which rotates within a vat containing a solution of alum or its equivalent, which coats the board upon both sides, impregnating it to a certain degree. In this con-

dition, however, it must not be wound into rolls, because the adhesive nature of the chemicals would cause its contiguous surfaces to adhere and prevent its being unrolled for use. To avoid this difficulty the board is passed between a second series of drying and calendering-rolls, to which increased heat is applied, and is by it thoroughly dried and hardened before being passed between the final calender-rolls. The latter, in fact, may be dispensed with if desired. Instead of the second series of drying-rolls a hot-air chamber may be employed for the purpose of drying the board, and may be arranged either in front or in rear of the final calenders. The effect of this second step in the process is to fill the board with crystallized alum, harden and finish its surface, and render it not only fire-proof but impervious to dampness. It also imparts a light color to the board and admits of its being wound into rolls without danger of adhering.

The straw board thus treated is not, strictly speaking, water-proof, although if immersed in water it will resist its action for many hours, but, when applied to the interior of buildings, will not be effected by atmospheric changes. If the board after being treated with the fire-proof solution should adhere to the surface of the second series of rollers, the latter may be coated with oil by any suitable arrangement of devices to remedy the difficulty.

If it should be found desirable a vat containing coloring matter, or combinations of the same, may be arranged between the first and second series of rollers, through which the board may pass to give it any preferred color or tint. Instead of a vat, rollers or brushes may be used to apply the coloring matter. When such colors are used as are not neutralized by the action of the fire-proof substances they may be placed directly in the vat containing the latter, and the coloring-vat, rollers, brushes, &c., dispensed with.

By my invention I am enabled to produce, by continuous operations from the pulp-vat to the winding device, continuous lengths of straw board made both fire-proof and impervious to dampness, and either colored by pigments or left plain.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. As a new article of manufacture, fire and damp-proof straw-board in continuous lengths, either plain or colored with pigments, for the purpose specified.

2. The process, substantially as herein de-

scribed, for treating continuous lengths of straw board to render them fire-proof and impervious to dampness, for the purpose specified.

FRANCIS N. DAVIS.

Witnesses:

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