2 Sheets—Sheet 1.

G. S. EYSTER.

Machine for Lining Straw-Board.

No. 221,403. **Patented Nov. 11, 1879.**

Fig. 1.

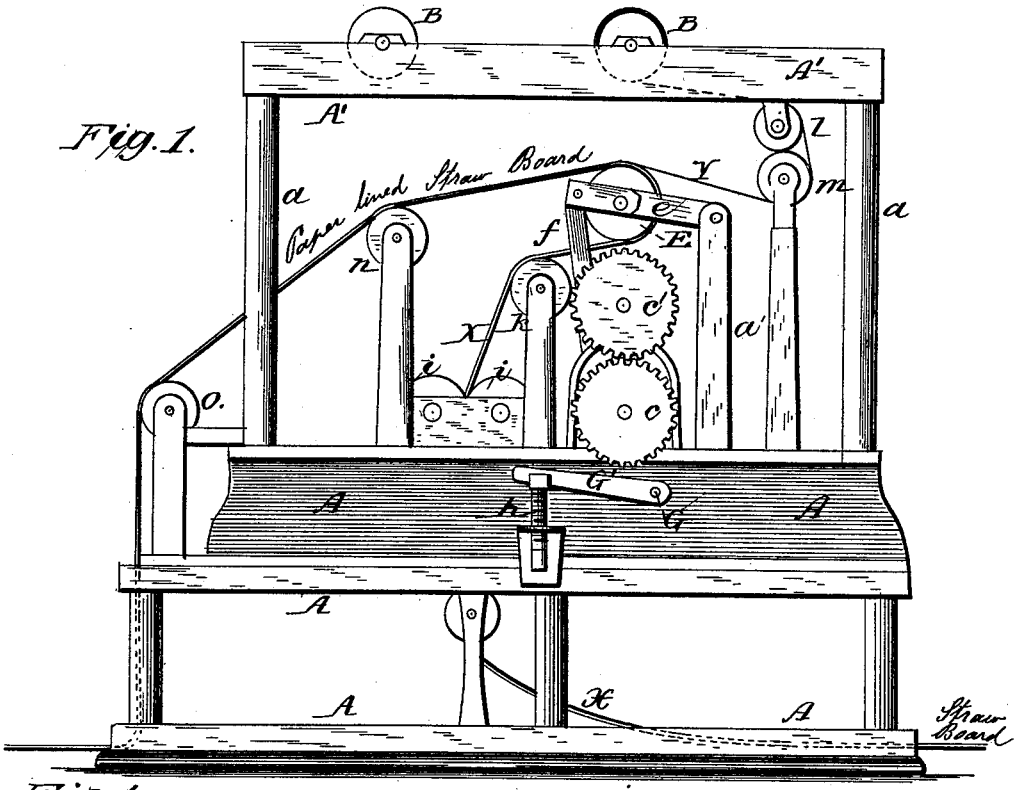
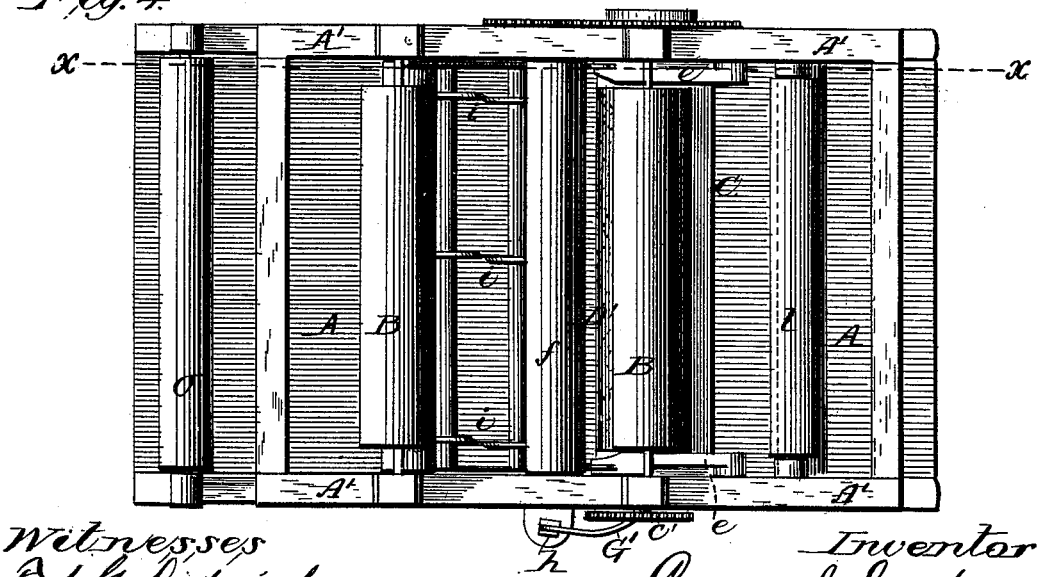


Fig. 4.



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Inventor.
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by Louis Bagger & Co.
his Attorneys

2 Sheets—Sheet 2.

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Fig. 2.

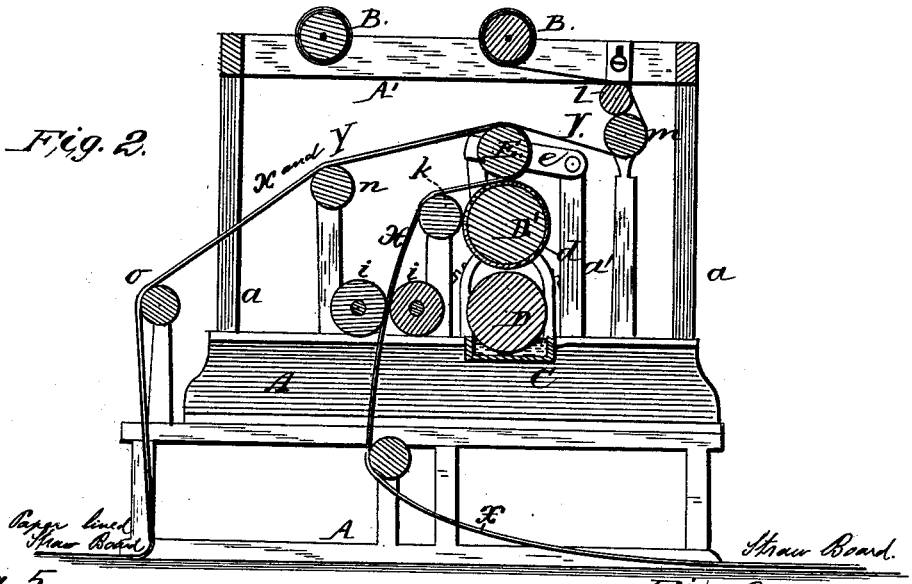


Fig. 5.

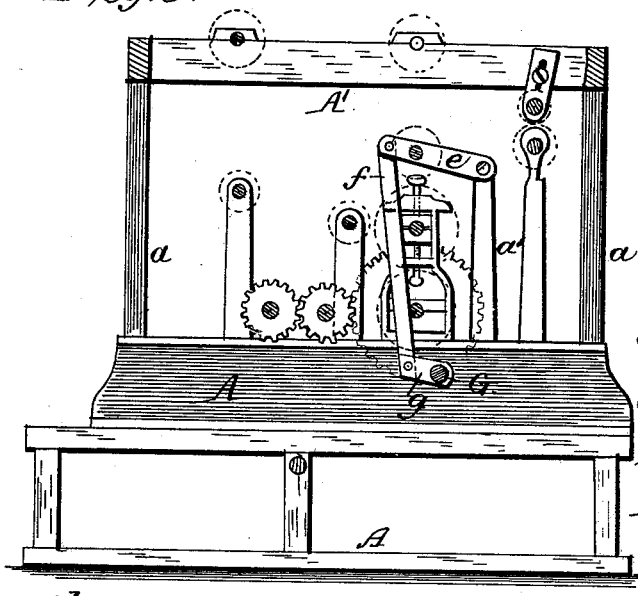
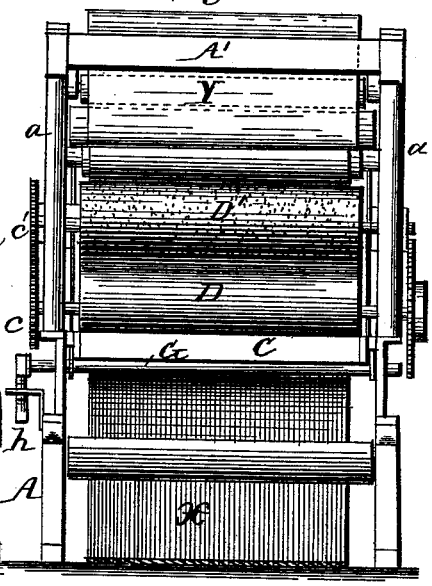


Fig. 3.



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UNITED STATES PATENT OFFICE.

GEORGE S. EYSTER, OF HALLTOWN, WEST VIRGINIA.

IMPROVEMENT IN MACHINES FOR LINING STRAW-BOARD.

Specification forming part of Letters Patent No. **221,403**, dated November 11, 1879; application filed July 18, 1879.

To all whom it may concern:

Be it known that I, GEORGE S. EYSTER, of Halltown, in the county of Jefferson and State of West Virginia, have invented certain new and useful Improvements in Machines for Lining Straw-Board; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a side elevation. Fig. 2 is a central longitudinal vertical section. Fig. 3 is a rear elevation. Fig. 4 is a plan or top view, and Fig. 5 is a longitudinal section taken on line *x x* in Fig. 4.

Similar letters of reference indicate corresponding parts in all the figures.

My invention has relation to that class of machines which are employed for lining continuous lengths of straw-board or other analogous material with a thin web of paper or textile fabric; and it consists in the construction and arrangement of parts of a machine adapted to apply the paste upon the straw-board instead of upon the thin paper lining, and then unite the paste-coated board and dry lining-paper by tension—that is, by carrying the continuous web of lining-paper across and bearing down against the roll, where it receives its board backing, in contradistinction to effecting the union by passing the board and paper between two or more pressure or uniting rolls, and thus causing the lining-paper to adhere to the board by direct pressure.

Heretofore this class of machines have been so constructed as to apply the paste, by means of suitably-arranged pasting-rollers, upon the continuous thin web of facing or lining paper, which is then applied to the surface of the straw-board (during the process of its manufacture and before it leaves the rolls, and becomes a finished and merchantable article as plain or unlined board) by pressure-rollers; but this process is objectionable for the reason that the web of lining-paper, being very thin and of a spongy or bibulous nature, will absorb the wet paste, which destroys its cohesion and makes it liable to tear or break on its passage from the pasting-rollers to the pressure roller or rollers, where it receives the straw-board. Again, the wet or moist facing-paper is liable to form wrinkles when it is applied upon the straw-board, even where the greatest care is exercised in the adjustment of the machinery, whereas the facing-paper, if applied in its natural dry condition upon a paste-covered surface, is less liable to break or wrinkle, admitting of a stronger tension and more thorough, even, and perfect union.

Hence the object of my present improvement is to construct a machine for applying facing-paper by tension, and without the use of pressure-rollers, upon straw-board, the paste being applied upon the surface of the board, which then receives the dry and perfectly-smooth lining of facing-paper.

In the two sheets of drawings hereto annexed, A represents the bed of the machine, the standards *a a* of which support an upper frame, A′, in which the white-paper rolls B B are journaled, their journals being provided with adjustable resistance or friction blocks, to provide for the proper tension of the paper as it is being wound off.

C is the paste-vat, in which the paste-roller D is partially immersed, while its mate or the distributing-roll D′, which is covered with a jacket, *d*, is journaled vertically above it, the rollers D D′ being operated by gear-wheels *c c′*, which mesh with each other, and by a drum or pulley arranged upon the shaft of either; and the distributing-roller D′, which receives the paste from D, may be adjusted in its boxing to regulate the supply of paste which it is to receive from the lower roller, which dips into the paste-vat.

Above the distributing-roller D′ is another roller, E, which is journaled in arms *e e* that are pivoted in the upper end of uprights *a′*, one on each side of the machine. In the other end of the pivoted arms *e* is hinged a rod, *f*, the lower end of which is pivoted in the crank *g* (see Fig. 5 of the drawings) of a rock-shaft, G, one end of which has a lever, G′, which is adjustable by means of a set-screw, *h*, in such a manner that lever G′ is free to move in an upward direction, while it is prevented from moving downward by the bifurcated head of

set-screw *h*, in which it rests. It follows that by operating the said set-screw the upper roller, E, may be adjusted in its relation to D'—that is, the distance between the two rollers D' E may be regulated at will for the purpose of regulating the supply of paste; but after this adjustment has once been effected, by manipulating screw *h* rollers D' E will remain in their relative positions during the operation or run of the machine.

From the foregoing description, taken in connection with the drawings, the operation of my machine will readily be understood. The finished but unlined straw-board (denoted by the letter X) is fed to the machine over suitably-arranged rollers, and may be split and trimmed by rotary cutters *i i* prior to lining. It is then carried over a roll, *k*, in between the adjustable distributing roller D, and hinged tension-roller E, where it receives a uniform coating of paste, and, being turned back or doubled over roller E, meets the dry white paper, (denoted by the letter Y,) which is passed over the rolls *l m*, and is united thereto. The paper-faced straw-board then passes over rolls *n o*, set at different elevations, and over a series of drying-cylinders, (not shown in the drawings,) where the lined straw-board is thoroughly dried and finished.

It will be observed that I dispense entirely with spreading and pressure rolls for smoothing, pressing, and uniting the facing-paper to the web of straw-board, this being effected solely by the tension of the dry lining-paper as it passes across and bears against the upper roll, E, and the intermediate web of board, this tension being obtained by placing the axle of the tension-roll E in bearings elevated above the rolls *m n*, as shown in the drawings.

After the paste-coated straw-board has received its lining of dry facing-paper no further operation than the drying of the lined straw-board is necessary.

It will further be observed by reference to the foregoing description, taken in connection with the drawings, that the straw-board is not lined in the process of manufacture, but fed to my lining-machine as a finished and merchantable article, as straw-board *per se;* nor does it, after it has received its thin paper lining, pass between pressing or uniting rolls, as usual in this class of machines as heretofore made.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a machine or apparatus for lining straw-board or analogous material, the combination, with a paste-roller and its distributing-roller, of an adjustable tension-roller, so arranged in its relation to the distributing-roller that it will operate, first, to feed the continuous web of board against the paste-coated surface of the distributing-roller, where it (the board) receives a thin film of paste, and, second, double the paste-coated board, as it leaves the distributing-roller, around itself, and present it to the continuous web of lining-paper at a point diametrically opposite to the point where it (the board) receives its film of paste from the distributing-roller, substantially as and for the purpose herein shown and set forth.

2. In a machine or apparatus for lining straw-board or analogous material, the combination, with a paste-roller and its distributing-roller, of an adjustable tension-roller, so arranged in its relation to the distributing-roller that it will receive the continuous web of finished but unpasted and unlined board between itself and the distributing-roller, bring it (the board) at this point in contact with the paste-film covering the distributing-roller, then double the straw-board around itself and present it to a continuous web of dry lining-paper, which is fed across and bears down against said tension-roller and the intermediate web of paste-coated straw-board, the union of the board and its lining being effected at this point by the tension or strain of the lining-paper against the board as it passes across the tension-roller, and without the aid of pressure or uniting rolls, substantially as and for the purpose herein shown and described.

3. In a machine or apparatus for lining straw-board or analogous material, the combination of a paste-reservoir, a paste-roll, a distributing-roll, and a hinged and adjustable tension-roll, for feeding and pasting the continuous web of board, with a pair of rolls arranged parallel to, but on opposite sides of, the tension-roll, and journaled in a lower plane than this, for feeding the dry lining-paper across and bringing it, by tension, in contact with the paste-coated board, and thus uniting the board and thin paper lining without the use of pressure or uniting rolls working on opposite sides of the lined board, substantially as and for the purpose herein shown and specified.

4. The process of lining a continuous web of dried and finished (calendered) straw-board with a continuous web of dry thin lining-paper, which consists in, first, coating the finished straw-board, by suitable pasting mechanism, with a thin film of paste, and, second, bringing the paste-coated board in contact with and uniting it to a continuous web of dry thin lining-paper while in a state of tension, and without the use of co-operating pressure or uniting rolls for effecting said contact and union, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

GEORGE S. EYSTER.

Witnesses:
LOUIS BAGGER,
GEO. F. GRAHAM.