(No Model.) 2 Sheets—Sheet 1.

# G. S. EYSTER.

## Machines for Lining Straw-Board.

No. 226,733. Patented April 20, 1880.

Fig. 1.

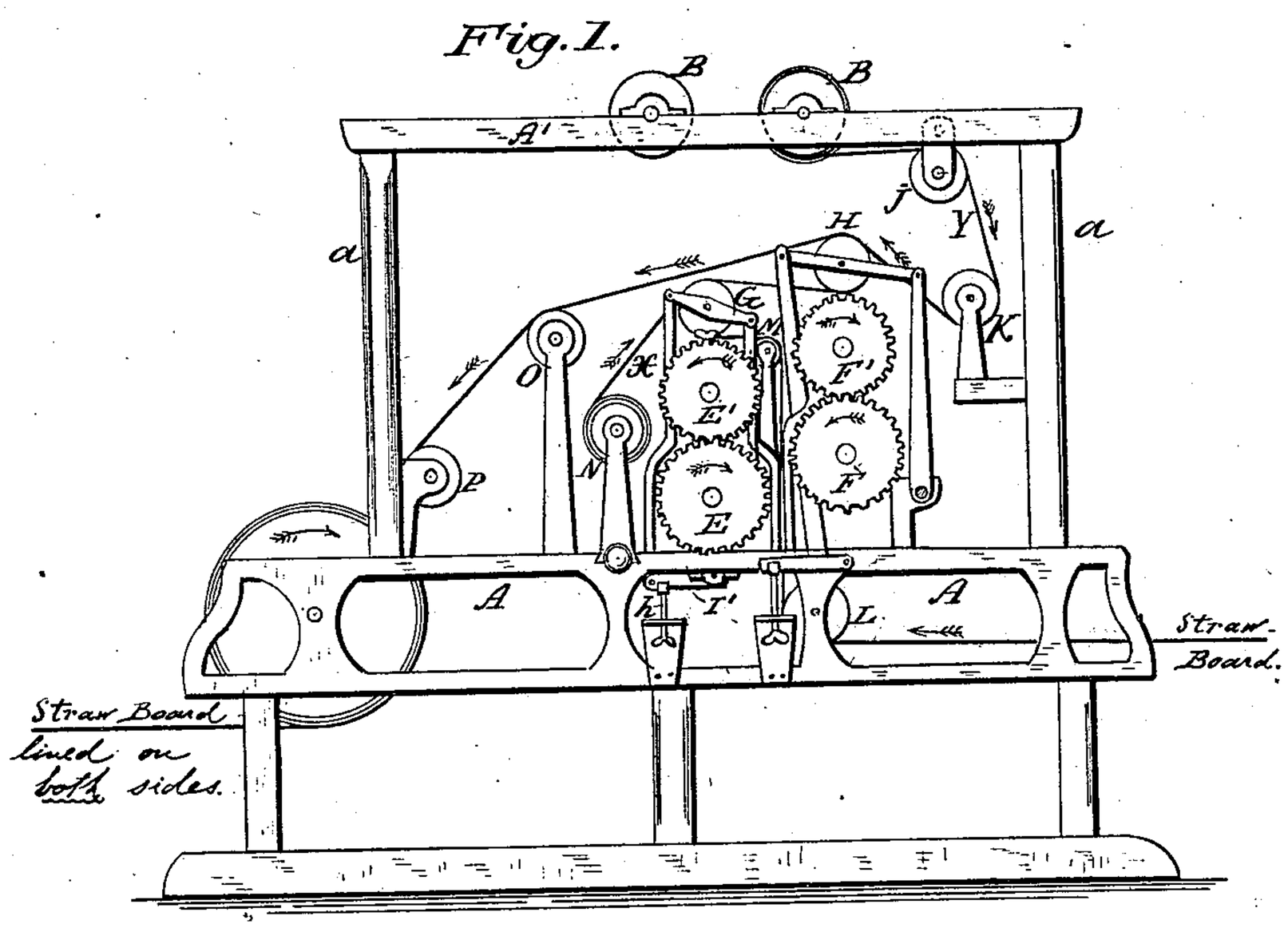
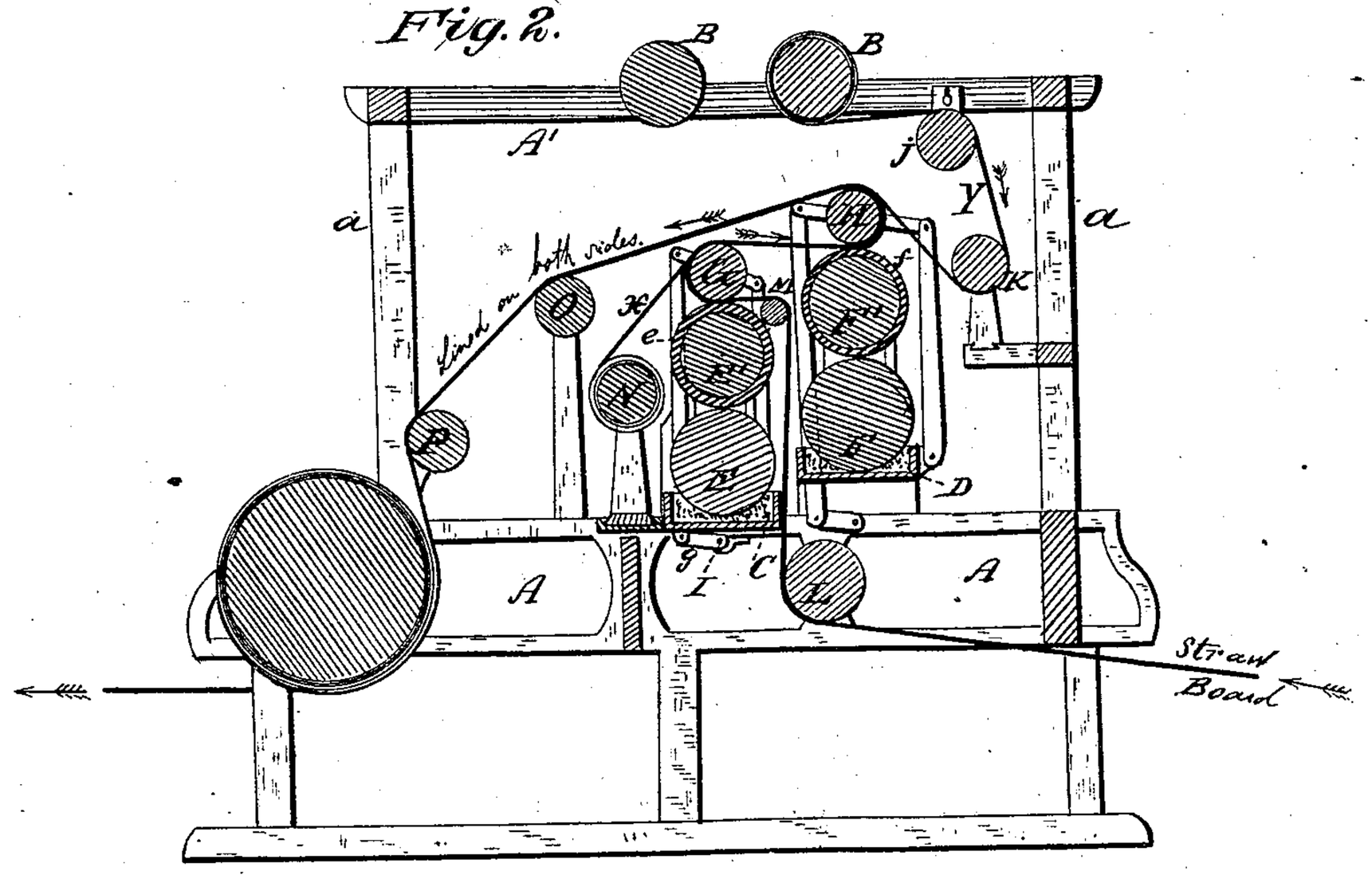



Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

# G. S. EYSTER.

## Machines for Lining Straw-Board.

No. 226,733. Patented April 20, 1880.

Fig. 3.

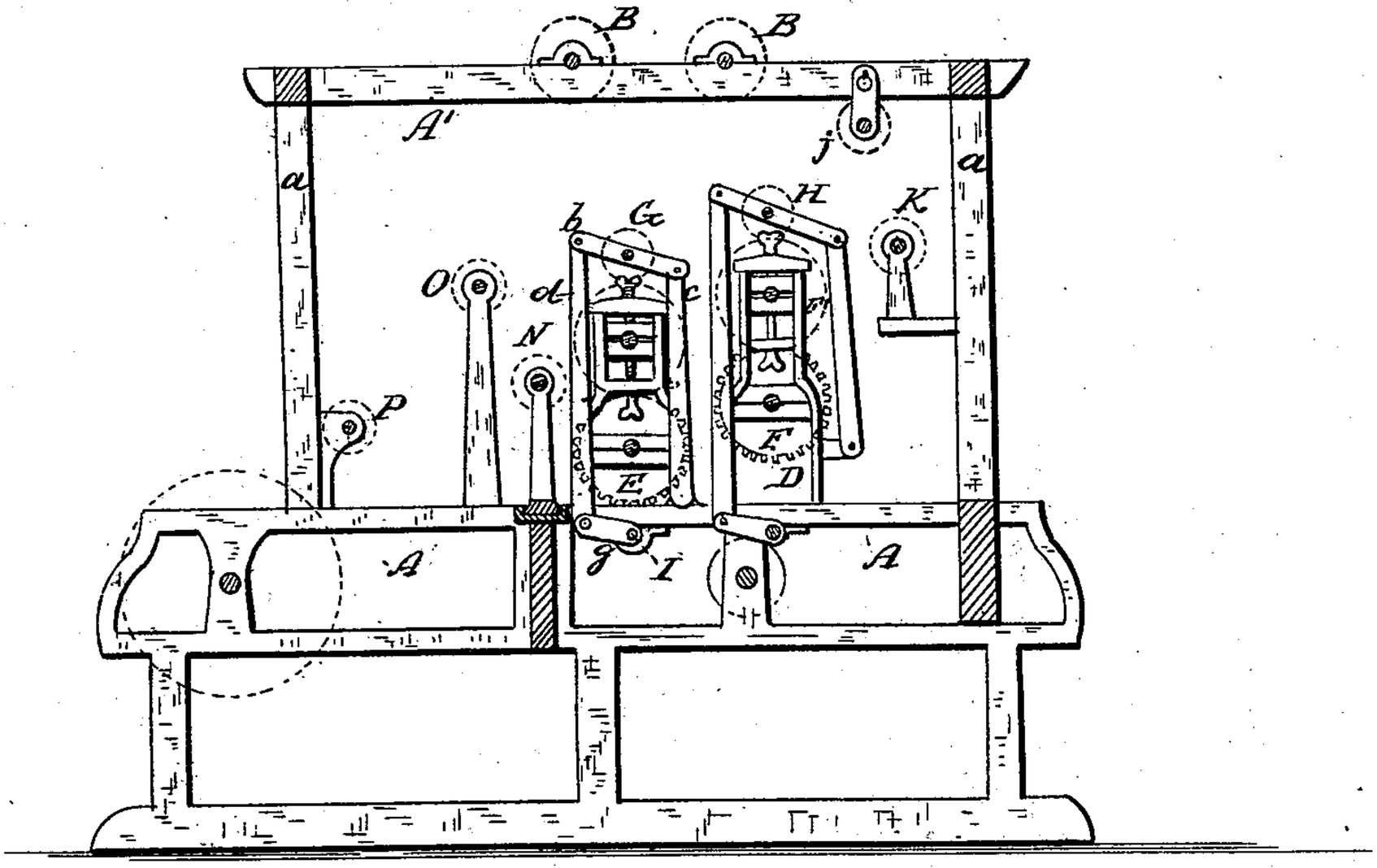
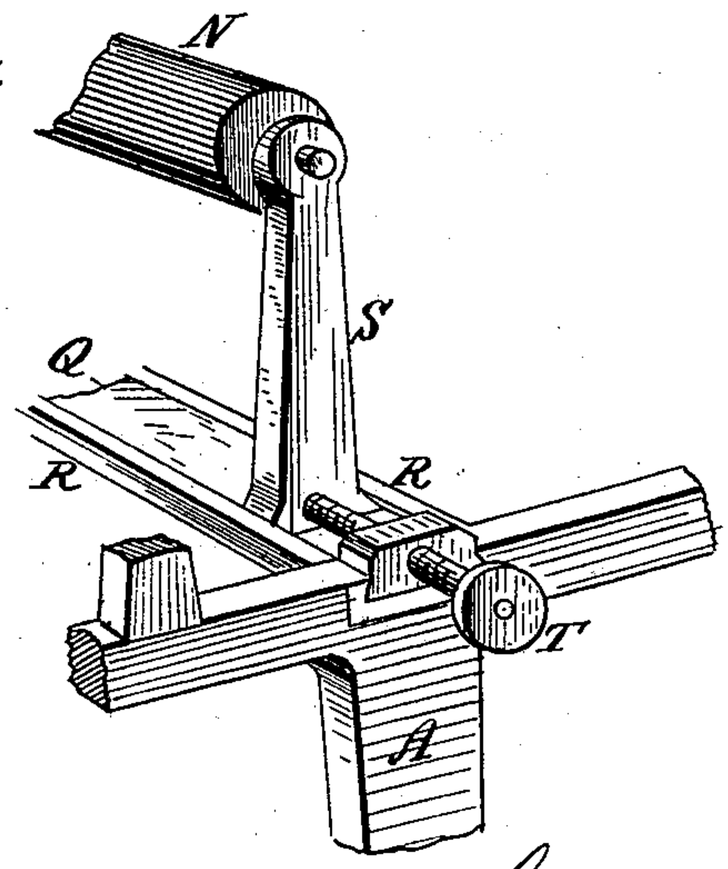



Fig. 4.

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# UNITED STATES PATENT OFFICE.

GEORGE S. EYSTER, OF HALLTOWN, WEST VIRGINIA.

## MACHINE FOR LINING STRAW-BOARD.

SPECIFICATION forming part of Letters Patent No. 226,733, dated April 20, 1880.

Application filed March 3, 1880. (No model.)

*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 vertical longitudinal section through the middle line of the machine. Fig. 3 is a similar section through one side of the machine, (parallel to the section represented in the foregoing figure,) showing the arrangement of the device for regulating and adjusting the tension of the upper or tension roller; and Fig. 4 is a detail view of the device for adjusting and regulating the position of the blue-paper roll in respect of the upper roll or tension-roller.

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 thin paper or textile fabric; and it consists in the construction and arrangement of parts of a machine adapted to line both sides of the straw-board simultaneously and at one operation—for example, applying white lining-paper to one side and blue paper to the other side—substantially as hereinafter more fully set forth.

In the Letters Patent of the United States No. 221,403, granted to me on the 11th day of November, 1879, I have shown and described a machine for lining a continuous web of straw-board with a continuous web of lining-paper on one side by first applying a thin film of paste to that side of the straw-board which is to receive the lining, and then uniting the paste-coated board and dry lining-paper by tension, in contradistinction to effecting the union by passing the board and paper between two or more pressure or uniting rolls.

In the machine which forms the subject of my present invention I employ the same principle; but instead of applying the paste to one side of the board only I apply a thin film of paste upon both sides—that is, first on one side, which then receives its lining, after which the lined board is pasted on its unlined side and the second lining applied, which, with the exception of drying this doubly-lined board, completes the operation.

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.

Two paste-vats, C D, are employed, arranged parallel to but one a little above the other, each of which has its appropriate paste-roller E F and distributing-roller E′ F′, each of which said distributing-rollers is covered, as usual, with a jacket, *e f*.

The several rolls or rollers E E′ F F′ are provided with suitably-arranged intermeshing gear-wheels, and one of them should have a drum or pulley, so that the whole set or series may be run by a single belt, if desired, revolving as plainly indicated by the arrows in Fig. 1. Each of the distributing-rollers E′ F′ is adapted to be adjusted in its boxing with reference to its paste-roller, to regulate the supply of paste which it is to receive from the latter.

The roller G is journaled in a pair of parallel arms, *b*, each of which is pivoted in the upper end of an upright, *c*, of which there is one on each side of the machine, opposite to each other. In the free end of one (or both) of said pivoted arms *b* is hinged a rod, *d*, the lower end of which is pivoted in a crank, *g*, at one (or both) end of a rock-shaft, I, which said rock-shaft is provided with a projecting arm or lever, I′, the free end of which may be adjusted by means of a set-screw, *h*, bearing against it from the under side in such a manner that lever I′ 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, G, may be adjusted in its relation to E′—that is, the distance between the two rollers E′ G may be

regulated at will for the purpose of regulating the supply of paste. After this adjustment has, however, been properly effected in the manner described, or by equivalent means, the said rollers E′ G are to remain in their relative positions during the operation or run of the machine.

In like manner and by a similar arrangement of pivoted arms supporting its axle, a connecting rod or rods, and a crank-shaft provided with a lever-arm, the adjustment of which is effected by a set-screw, may roller H be adjusted in relation to its co-operating roller F′; and, if desired, these adjusting devices may be so constructed and connected that the operation of one affects the other, so that by adjusting roller G roller H is adjusted to the same extent, or vice versa.

If desired, the said upper rollers, G H, may be provided with cog-wheels that mesh with the gear-wheels on rollers E′ and F′, respectively, which does not interfere with the function of said upper or tension rollers, and under certain circumstances proves very efficacious.

The proper adjustment of the several rolls having been effected, the straw-board is fed between rollers E′ G, as shown in Fig. 2, by passing it over suitably-arranged guide-rollers L M. In its passage between rollers E′ G, the side facing roller E′, it is coated with a thin film of paste, and is then doubled around the tension-roller G, where it meets the blue paper X, which is fed from the blue-paper roll N up over roller G, where it comes in contact with and is united by its tension to the paste-coated side of the straw-board. The blue-lined board now travels, in the direction of the arrow, in between the next pair of rollers, F′ H, where the unlined side of the board receives a film of paste, after which it is doubled around roller H, where it meets the white lining-paper Y from the white-paper roll over the rolls J K, and is united thereto simply by the tension of the white paper over roller H, and without the aid of spreading-rolls, pressure-rolls, or similar contrivances of any sort. The board, which is now lined on both sides, next passes over rolls O P, set at different elevations, and over a series of drying-cylinders, where the double-lined straw-board is thoroughly dried and finished.

The blue paper feed-roll N should be made adjustable in a plane parallel to that of the axis of roller G—that is, transversely to the bed or frame of the machine, which can be effected in different ways. I prefer to use the arrangement shown more clearly in Fig. 4 on Sheet 2 of the drawings, which consists simply of a dovetailed bar, Q, placed transversely across the frame and sliding between dovetailed guide-bars, or in a dovetailed plate, R. Bar Q has an upright, S, at each end, between which the blue-paper roll N is hung, and the sliding bar may be adjusted by means of a set-screw, T, working through a collar secured on one side of the machine-frame, so that by simply turning this screw the position of the blue-paper roll relative to the tension-roll G may be effected with great nicety and accuracy, thus smoothing out wrinkles in the lining-paper and counteracting the effect of untrue or uneven winding of the paper upon its roll from which it is fed.

It will be seen, on comparison of this machine with the lining-machine for which Letters Patent were granted to me on November 11, 1879, No. 221,403, that it is substantially the same machine, with the addition of the paste-vat C and rollers E E′ G, or, considering these as parts of the old machine, with the addition of the vat D and its rollers F F′ H. Hence, simply by adding this extra set of rolls with their vat to the old machine, this is transformed into a double-lining machine without otherwise disturbing or affecting its operative parts.

The advantages of a machine adapted to line straw-board and analogous material on both sides by a single operation will readily be appreciated without further explanation. It saves time, labor, and money, and produces a better and more merchantable article of manufacture than board which is lined upon one side only, or lined in a continuous web upon one side by machinery only, and then cut up in sheets which are lined each separately on the other side by hand.

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

1. A machine for lining a continuous web of straw-board or analogous material upon both sides by a single operation without the use of pressure or compressing rolls, substantially as set forth.

2. The process of lining a continuous web of straw-board or analogous material upon both sides and by a single operation with two continuous webs of dry facing or lining paper, one for each side, by uniting each sheet or web of dry lining-paper to its respective paste-coated side of the board to be lined by stretching the board successively over two rolls arranged parallel to each other but at different elevations, and then stretching or passing one of the webs of lining-paper over one of these rolls and the second web of lining-paper over the second roll, both webs being in a state of tension, and united to their respective sides of the paste-coated board by such tension and without the use of co-operating pressure or uniting rolls, substantially as set forth.

3. In a machine or apparatus for lining straw-board or analogous material, two paste-rollers mounted in parallel planes and each operating in conjunction with a distributing-roller, in combination with a pair of tension-rollers operating in conjunction with the said distributing-rollers, one of which said tension-rollers operates, first, to feed the continuous web of board against the paste-coated surface of its co-operating distributing-roller, where it (the board) receives a thin film of paste; and

second, to double the paste-coated board, as it leaves said distributing-roller, around itself and present it to a continuous web of lining-paper, while the second of said tension-rollers operates, first, to feed the continuous web of board (lined upon one side) with its unlined side against the paste-coated surface of its co-operating distributing-roller, where it (the board) receives a thin film of paste; and, second, to double said lined and paste-coated board, as it leaves said distributing-roller, around itself and present its unlined side to a continuous web of lining-paper, thus lining the board on both sides by a single operation, substantially as and for the purpose herein shown and set forth.

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

GEORGE S. EYSTER.

Witnesses:
T. B. MOORE,
J. ALLISON EYSTER.