(No Model.)

A. W. CASE.

MACHINE FOR MAKING PAPER BOARD.

No. 598,241 Patented Feb. 1, 1898.

Fig. 1.

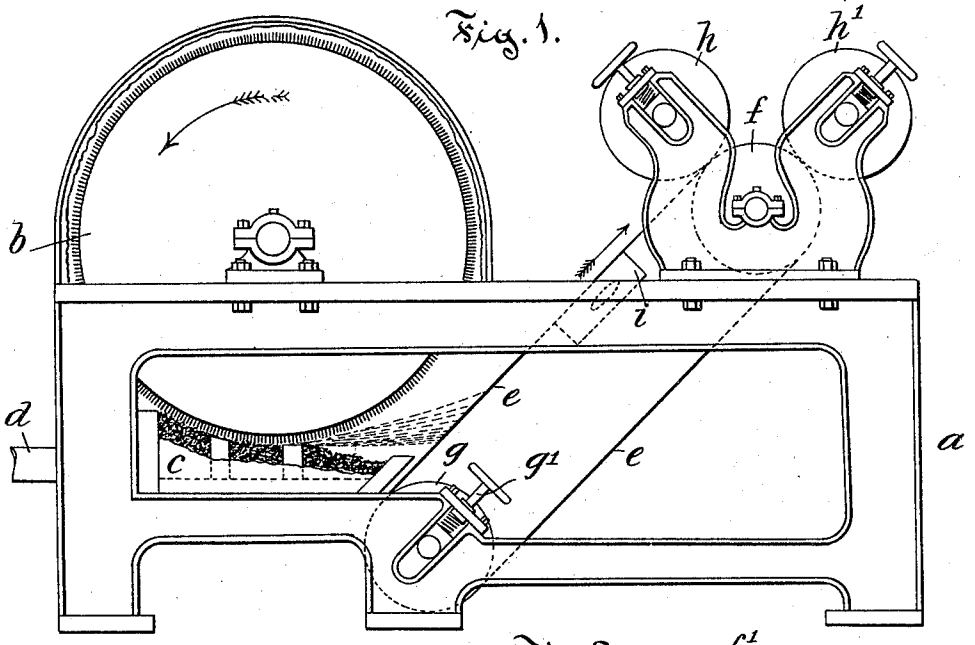
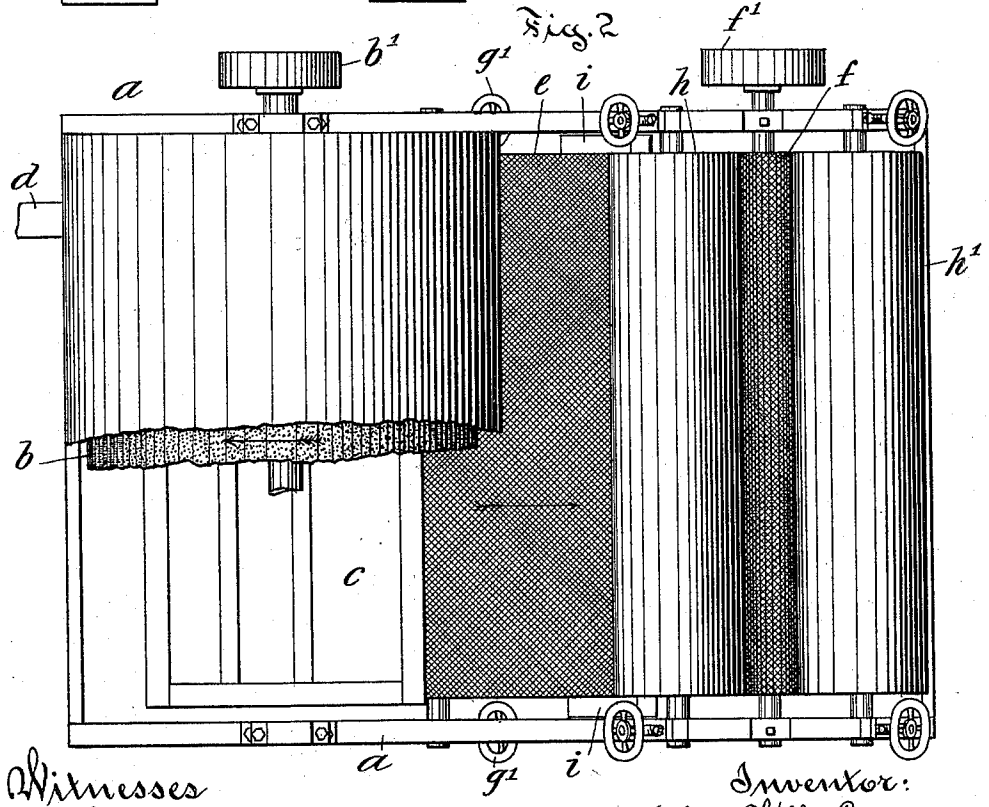


Fig. 2



Witnesses
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ALFRED WELLS CASE, OF HIGHLAND PARK, CONNECTICUT.

MACHINE FOR MAKING PAPER-BOARD.

SPECIFICATION forming part of Letters Patent No. 598,241, dated February 1, 1898.

Application filed May 22, 1894. Serial No. 512,087. (No model.)

To all whom it may concern:

Be it known that I, ALFRED WELLS CASE, a citizen of the United States, and a resident of Highland Park, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Machines for Making Paper-Board, of which the following is a full, clear, and exact description, whereby any one skilled in the art can make and use the same.

My invention relates to the class of paper-making machines which are used for producing a sheet of paper made of pulp of any ordinary materials employed in paper-making.

The object of my invention is more particularly to provide a machine by means of which a continuous sheet of paper or paper-board may be made on a machine in such manner as to avoid the lamination of the sheet, which results when a thick sheet of paper is made by some of the old methods where machinery is employed.

My invention relates more particularly to machines for making "paper-board," as it is called, these being thick sheets of the material adapted for special use in providing material for use of bookbinders and also in other branches of the mechanical arts.

In the manufacture of paper-board by machinery it has been customary to make up a sheet of a limited thickness on a wire or blanket and to wind such sheet over the upper wet press-roll until the superimposed layers are built up to the required thickness. This paper-board is then slitted lengthwise and stripped from the roll, pressed, dried, and otherwise treated to put it in proper condition for use. A disadvantage in paper-board made in this manner is that the layer which was on the outside of the roll becomes wrinkled when the cylindrical sheet is spread flat, and such wrinkles and wavy lines are objectionable. Another defect is in the separation of the layers or laminæ, the board of course being separable into as many distinct layers in the sheet spread out as there are separate layers on the cylinder on which the board was formed.

My invention consists in the details of the several parts making up the device as a whole and in the combination of such parts as are hereinafter described, and more particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a detail view, in side elevation, of a machine for the practice of my invention with parts cut away to show construction. Fig. 2 is a detail top or plan view of the machine with parts cut away.

In the accompanying drawings the letter *a* denotes the frame of the machine, which may be made of any desired shape and proportion; *b*, the pulp-feed cylinder mounted on suitable journals preferably near one end of the frame and provided with means, as a pulley *b'*, for driving the cylinder at the desired rate of speed. Below the pulp-feed cylinder *b* is arranged a stuff-box *c*, into which the paper-stock in the pulp form is conveyed, as through the pipe *d*, by means of a pump. This stuff-box is preferably divided lengthwise into a series of compartments, so as to enable the pulp as it flows from one compartment to the other to be brought properly into contact with the swiftly-moving surface of the feed-cylinder.

The pulp is supplied to the stuff-box *c* in what may be termed a "semiliquid" state—that is, in such a state as to enable it to flow somewhat slowly from a high to a low point. This will enable the mass to be supplied to the stuff-box *c* as by means of a pump, and the mass will flow slowly along the stuff-box over the partitions in the direction of movement of the surface of the cylinder. This semiliquid state of the mass will cause the pulp to remain at a higher level at the point where it enters the stuff-box and comes in contact with the cylinder than at the opposite end, the supply through the pipe *b* being properly regulated to accomplish this result.

In a suitable position, preferably inclined, as shown, and located in front of the feed-cylinder and the box is a wire-cloth or felt *e*. This cloth *e* is supported on a roll *f*, mounted in suitable bearings on the frame and having a pulley *f'*, by means of which it may be rotated. It is preferably in the form of an endless apron extending also around the tension-roll *g*, mounted in slotted bearings and provided with the usual adjusting-screws *g'*, by means of which the tension of the wire-cloth or apron may be regulated. There are also

preferably provided in suitable bearings the two press-rolls *h h'*, which serve to in a degree remove a part of the superfluous moisture from the material as it is fed underneath them. The sheet of material formed on the apron is removed therefrom and conducted to a drier or other support in any ordinary manner. A suction-box *i*, suitably arranged below the wire-cloth or felt apron, serves also to remove a portion of the moisture from the pulp as it passes over the box on the apron.

In the machine described herein the feed-cylinder is rotated at a speed sufficient to throw the pulp by centrifugal force upon the apron and cause it to adhere and be built up upon the apron while the latter is in motion. The surface of the feed-cylinder *b* is roughened or provided with teeth or like parts that pick up from the surface of the mass of pulp in the box or vat a certain quantity of fiber and throw it forward at a tangent to the cylinder. Under such conditions of operation the thickness of the sheet formed upon the apron will depend upon the relative speed of the apron, and that may be determined by any convenient mechanism. By this means of making a sheet of paper or like board it is obvious that a continuous sheet can be formed and also that it will be homogeneous and free from any laminations and of any desired thickness, depending, as stated, on the relative speed of the apron, the speed of the feed-cylinder, and the condition of supply of pulp to the cylinder being constant.

I claim as my invention—

1. In a paper-making machine in combination a frame, a pulp-vat having a series of crosswise partitions, a pulp-supply pipe communicating with the vat, a rotary feed-cylinder having its surface provided with means for gathering a quantity of pulp from the surface of the pulp in the vat and discharging it from the surface of the cylinder, an endless apron or wire-cloth mounted on rollers in the frame, means for moving the apron, the suction-box and the press-rolls adapted to extract moisture from the layer of pulp on the wire, all substantially as described.

2. In combination in a paper-making machine, a pulp-vat having a series of crosswise partitions, a rotary feed-cylinder having a movement across the compartments formed by the partitions, and provided with means for gathering a quantity of pulp from the surface of the mass of pulp in the vat, an endless apron or wire-cloth mounted in rollers on the frame and having a movement in an endless path away from the cylinder, means for moving the apron, and means for rotating the cylinder, all substantially as described.

3. In combination in a paper-making machine, a pulp stuff-box, a rotary feed-cylinder having its outer surface arranged partly within the stuff-box, means for rotating the feed-cylinder, a movable cloth or wire placed at an angle to a tangent to the surface of the feed-roll and adjacent thereto at its point of contact with the pulp in the stuff-box, whereby the stuff is delivered by the roll directly onto the apron.

4. In a paper-making machine in combination a frame, a pulp-vat having a series of crosswise partitions, a rotary feed-cylinder having a movement across the compartments formed by the partitions and provided with means for gathering a quantity of the pulp from the vat and discharging it from the surface of the cylinder, a movable cloth or wire placed at an angle to a tangent to the surface of the rotary feed-cylinder at its point of contact with the pulp in the stuff-box.

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