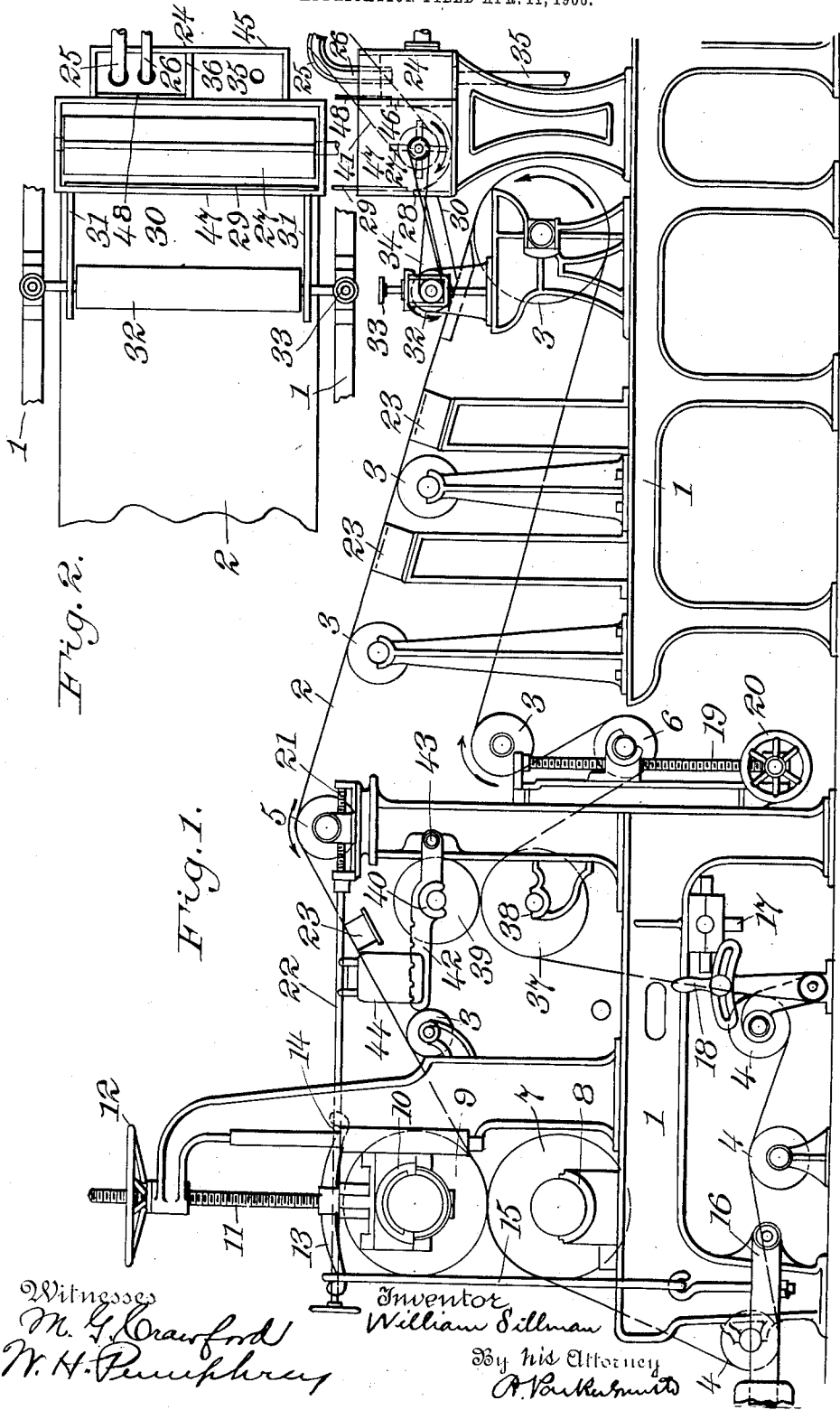


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MACHINE FOR MAKING MILLBOARDS.
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MACHINE FOR MAKING MILLBOARD.

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To all whom it may concern:

Be it known that I, WILLIAM SILLMAN, a citizen of the United States of America, and a resident of the borough of Brooklyn, county of Kings, city and State of New York, have invented certain new and useful Improvements in Machines for Making Millboard, of which the following is a specification.

My invention relates generally to the manufacture of plates, sheets, or boards out of pulp-like mixtures, and more specifically consists of improved mechanism for economically handling mixtures containing ingredients of great fineness of pulverization and considerable specific gravity.

Heretofore it has been customary to employ apparatus of the general paper-making or cardboard-making machine type known in the art as "wet" machines for the purpose of making millboard and heavier plates or sheets out of various pulped fibrous materials including short asbestos fibers mixed with various pulverized materials as fillers and as active constituents in the composition. When a material which is finely pulverized, such as hydraulic cement, and which has considerable specific gravity is employed in large quantity in such manufacture, the same is wasted in large part by being drawn through the meshes of the wire-cloth-covered roll upon which the pulp material is originally deposited by the action of suction and so carried away and also by being deposited in the bottom of the tank of the wet machine by virtue of its greater specific gravity. My invention overcomes this feature of waste by practically compelling all of the heavier and finely-divided constituent of the mixture to enter into the finished product, and has other advantages and economies to be hereinafter pointed out.

One form of apparatus embodying my invention is illustrated in the accompanying sheet of drawings, in which—

Figure 1 is a side elevation of the machine, and Fig. 2 is a detail plan view of the mixing-box and connections and spreading-roller.

Throughout the drawings like reference-figures indicate like parts.

1 1 represent parts of the main frame of the machine, and 2 is an endless band of felt running over a series of guide-rollers 3 3, &c. 17 is a beater for cleaning said felt; 4, an adjusting-roll for guiding the felt in proper re-

lation to the beater, the position of which is controlled by the adjusting-lever 18.

23 23, &c., are suction-boxes of any convenient form over which the felt 2 passes. The suction may be produced by steam-jets, blowers, or in any convenient manner. (Not here illustrated.) The felt 2 is properly guided with reference to these suction-boxes by the adjustable roll 5, the position of which is controlled by the screw 21, operated by the hand-wheel shaft 22.

6 is a tightening-roll for the endless band of felt, the position of which is controlled by the screw 19 and the hand-wheel 20.

7 is a lower press-roll mounted in stationary journal-bearings 8, and 9 the upper press-roll mounted in movable journal-bearings 10, carried by the lever 13, pivoted to the main frame at 14 and pulled downward by the link 15, which is connected to the weighted pressure-lever 16.

11 is a screw for limiting the downward motion of the upper press-roll 9 by means of the adjustable hand-wheel nut 12. The endless felt of course passes between the press-rolls, as shown.

37 is the lower drying-roll for the felt, mounted in stationary journal-bearings 38, and 39 is the upper drying-roll mounted in journal-bearings 40 in the lever 42, pivoted to the main frame at 43 and pressed downward by the adjustable weight 44.

24 is the mixing-box, to which the stock or material, such as asbestos fiber and Portland cement beaten up with a sufficient quantity of water, is delivered through the stock-pipe 25.

26 is a water-pipe through which a suitable quantity of water is delivered.

46 is a passage leading from the mixing-box to the distributing-trough 47. This passage is controlled by a gate 48. The trough 47 has a curved bottom, as shown in dotted lines.

27 is an agitator of any convenient form, located in the distributing-trough. As shown, it consists of a horizontal shaft with a series of beater-arms, the shaft being rotated by a power-belt 41 or any other convenient means. The side of the distributing-trough, which is next the agitator, has a horizontal delivery-slot 28 formed therein at a height approximately corresponding to the axis of the agitator 27. 29 is an adjustable gate for said slot.

30 is an inclined apron of oil-cloth or similar material extending from the edge of the distributing-trough below the slot 28 down to a point over the upper strand of the endless felt 2. This apron has upturned sides 31 31.

32 is a regulating-roll having a face of rubber or similar suitable material mounted in journal-bearings, which can be adjusted toward or away from the felt by means of the adjusting-screw 33. This roll may cooperate with the felt 2 or with the apron 30 or with both at their juncture. It is rotated by the belt 34 in the direction to produce circumferential travel on its under side opposite to the travel of the felt at the point of contact therewith or opposite to the direction of flow of the material down the apron 30.

35 is an overflow-pipe from the mixing-tank, and 36 a partition which permits any excess of material to flow over into the compartment 45, which serves as an overflow-box and which is drained by the overflow-pipe 35.

The operation of my invention is as follows: The guide-roller system and the endless band of felt 2, carried thereby, being set in motion by means of power, (not shown,) and the supply of pulp-stock, cement, and water being turned onto the mixing-box, the same will overflow through the slot 28 in an even stream down the inclined apron 30 to the upper strand of the endless felt 2, upon which it will be deposited in a thin even layer or film by means of the action of the regulating-roll 32 and the traveling motion of the felt. A compound layer of cement and pulp is thus formed on the felt 2, and as this passes over the suction-boxes 23 23, &c., a considerable quantity of the water or other liquid is sucked down through the felt, and the layer of material on the felt is left in a sufficiently dry condition to adhere to the upper press-roll 9 as the felt passes through said press-rolls. This press-roll is usually made of iron. A film of material is therefore wound upon the upper press-roll 9, the same rising as the thickness of the winding on its surface increases until a predetermined thickness is attained, when the cylindrical covering thus formed is slit longitudinally of the cylinder by a knife in the hands of the operator and removed in the shape of a plate or sheet whose length is the length of the cylinder and whose width is the circumference thereof. The felt from which the major portion of the material has thus been removed passes on down around the guide-rolls 4 and up by the beater 17, which knocks out of the felt the small quantity of material remaining therein. The felt then passes between the drying-rolls 37 38, which squeeze the moisture out of it, and thence around the tightening-roll 6 back to the neighborhood of the mixing-tank, where it

again has deposited upon it the film of material.

The advantages of my invention comprise the practically complete saving of all waste of material, there being no opportunity for any of the cement or other substance to escape deposition upon the felt 2, the prolonged life of the felt itself which is not forced into destructive contact with the wire-cloth used in former machines, and the possibility of cleaning and drying the felt, &c.

It is evident, of course, that various changes could be made in the relative arrangement and form of the parts of my invention without departing from the spirit and scope thereof, so long as the general principle of operation above set forth be adhered to.

Having, therefore, described my invention, I claim—

1. In a machine for making millboard and similar substances, the combination of a pair of press-rolls, a series of suction-boxes, an endless band of felt passing over said suction-boxes and through said rolls and means for initially depositing a dilute mixture of pulped fiber and cement on the upper section of said endless felt.

2. In a machine for making millboard and similar substances, the combination of a pair of press-rolls, a series of suction-boxes, an endless band of felt passing over said suction-boxes and through said rolls and means for initially depositing the materials to be employed on the upper section of said endless felt, said means comprising a distributing-trough, means for supplying a dilute mixture of pulped fiber and cement thereto, a graduated sluiceway therein, approximating in length the width of the felt, and a conveyor from said sluiceway to the upper section of the endless felt.

3. In a machine for making millboard and similar substances, the combination of a pair of press-rolls, a series of guide-rolls, an endless band of felt passing over said guide-rolls and through said press-rolls and means for initially depositing a dilute mixture of pulped fiber and cement on the upper section of said endless felt, said means comprising a distributing-trough, a graduated sluiceway therein, an agitator in the trough located adjacent to the sluiceway, and an apron extending from the sluiceway to the upper section of the endless felt.

4. In a machine for making millboard and similar substances, the combination of a pair of press-rolls, a series of guide-rolls, an endless band of felt passing over said guide-rolls and through said press-rolls and means for initially depositing a dilute mixture of pulped fiber and filler on the upper section of said endless felt, said means comprising a distributing-trough, a graduated sluiceway therein, an agitator in the trough located adjacent to

the sluiceway, and an apron extending from the sluiceway to the upper section of the endless felt, said apron having upturned sides spaced apart a distance equal to the width of the millboard to be formed.

5 5. In a machine for making millboard and similar substances, the combination of a pair of press-rolls, a series of guide-rolls, an endless band of felt passing over said guide-rolls, 10 and through said press-rolls, and means for initially depositing a dilute mixture of pulped fiber and cement on the upper section of said endless felt, together with a distributing-roll located over the felt near the point where the 15 material is delivered to it.

6. In a machine for making millboard and similar substances, the combination of a pair of press-rolls, a series of guide-rolls, an endless band of felt passing over said guide-rolls 20 and through said press-rolls and means for initially depositing a dilute mixture of pulped fiber and filler on the upper section of said endless felt, together with a distributing-roll located over the felt near the point where the

material is delivered to it, said roll revolving 25 in a direction to produce circumferential travel on its under side opposite to the travel of the felt at the point of contact therewith.

7. In a machine for making millboard and similar substances, the combination of an 30 endless traveling belt, a distributing-trough having a semicircular bottom cross-section, an agitator-reel journaled in said trough concentrically with said semicircular cross-section, an opening in the side of the trough par- 35 allel to the axis of the reel and in about the same horizontal plane, means for conducting the overflow from said opening to the endless belt, means for rotating the reel and means for supplying stock to the distributing- 40 trough at a constant and uniform rate.

Signed at Brooklyn, New York, this 7th day of April, 1906.

WILLIAM SILLMAN.

Witnesses:

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