

No. 840,387.

PATENTED JAN. 1, 1907.

W. SILLMAN.
MACHINE FOR MAKING MILLBOARD.

APPLICATION FILED JUNE 11, 1906.

2 SHEETS—SHEET 1.

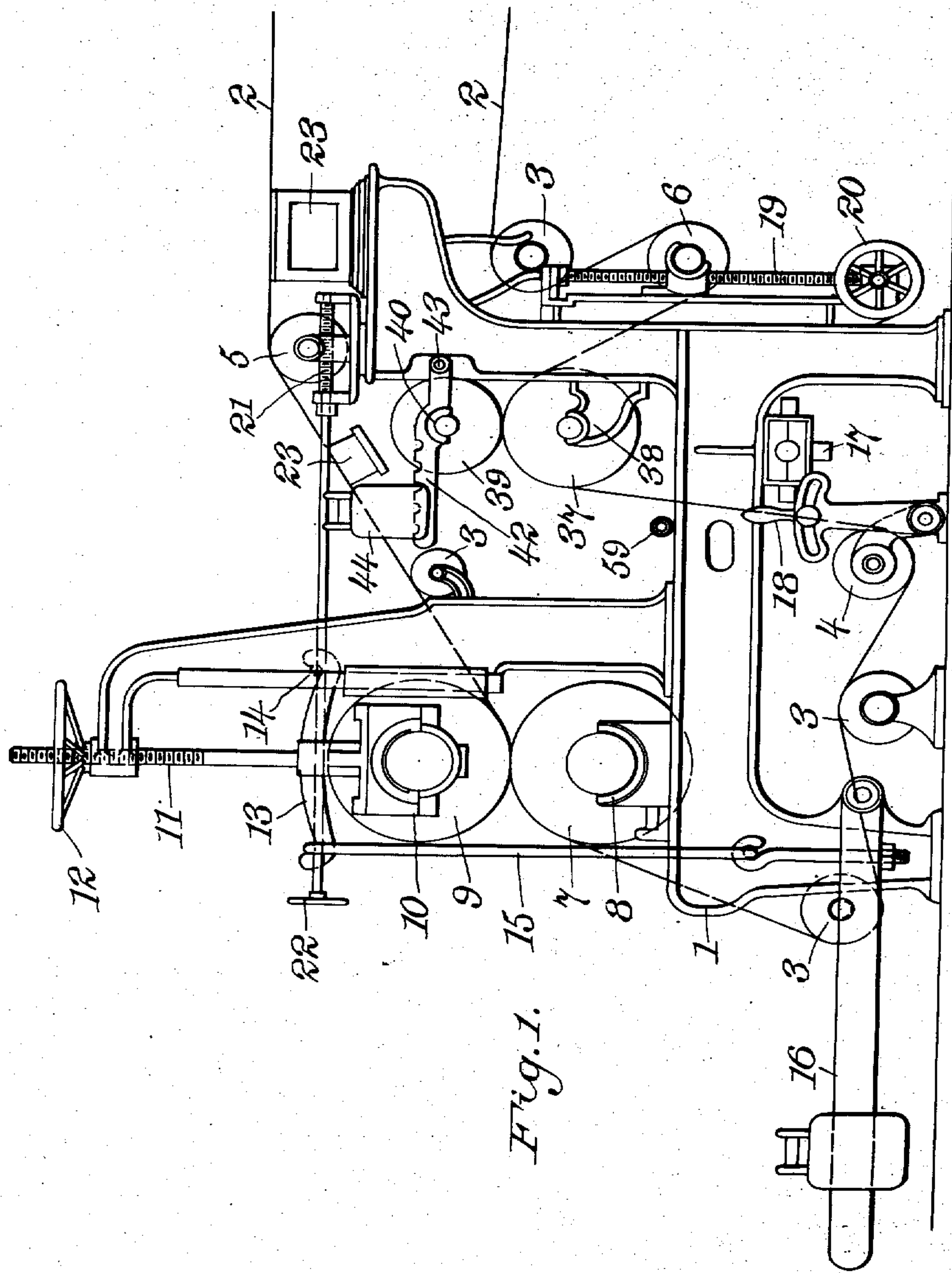


Fig. 1.

Witnesses
M. L. Crawford
N. H. Humphrey

Inventor
William Sillman
By his Attorney
A. Parker Smith

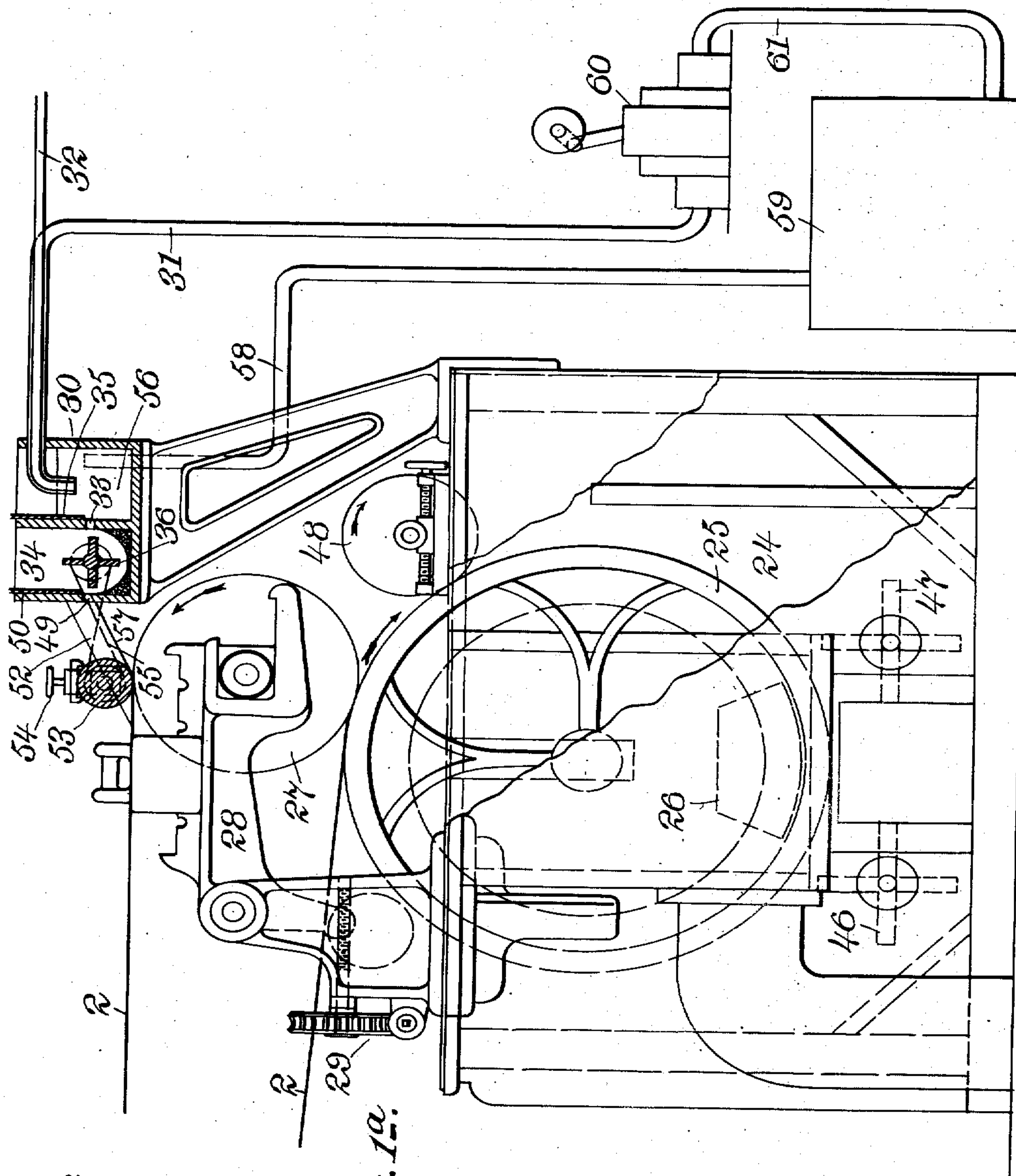
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Fig. 1a.

Inventor
William Sillman
By his Attorney A. Parker Smith

UNITED STATES PATENT OFFICE.

WILLIAM SILLMAN, OF NEW YORK, N. Y.

MACHINE FOR MAKING MILLBOARD.

No. 840,387.

Specification of Letters Patent.

Patented Jan. 1, 1907.

Application filed June 11, 1906. Serial No. 321,114.

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 to enter into the finished product and has other advantages and economies.

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

Figures 1, 1^a is a side elevation of the machine with parts broken away.

Throughout the drawings like reference-figures indicate like parts.

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

23 23, &c., are suction-boxes of any con-

venient 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.

7 is a tightening-roll for the endless band of felt, the position of which is controlled by roll mounted in movable journal-bearings 10, 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-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.

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. Before entering these drying-rolls the felt is further cleansed by the water-spray 59.

24 is a tank or vat to which one portion of the stock or material, such as asbestos fiber beaten up with a sufficient quantity of water, is delivered together with additional water if required, as in the process heretofore used upon the wet-machine. In this vat is the usual rotating wire-cloth cylinder 25, the interior portion of which is drained by the outlet connection 26.

46 47 are stirrers or agitators located in the bottom of the vat.

48 is a cleaning-roll by which any material picked up by the wire-cloth and not transferred to the endless belt 2 may be removed.

The guide-roller 27 is carried on the bell-crank 28, pivoted to the main frame and adjustable through the worm-wheel and worm-screw mechanism 29.

30 is a mixing-box to which one portion of the stock or material, such as Portland cement finely pulverized and mixed up with a sufficient quantity of water, is delivered through the stock-pipe 31.

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

33 is a passage leading from the mixing-

box to the distributing-trough 34. This passage is controlled by a gate 35. The trough 34 has a curved bottom, as shown in cross-section. 36 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 any convenient means. The side of the distributing-trough which is farthest from the mixing-box has a horizontal delivery-slot 49, formed therein at a height approximately corresponding to the axis of the agitator 36. 50 is an adjustable gate for said slot.

57 is an inclined apron, of oil-cloth or similar material, extending from the edge of the distributing-trough below the slot 49 to a point over the upper strand of the endless felt 2. This apron has upturned sides, one of which is shown at 52. A regulating-roll 53, having a face of rubber or similar suitable material, is mounted in journal-bearings which can be adjusted toward or away from the felt 2 by means of the adjusting-screw 54. This roll may cooperate with the felt 2 or with the apron 51, or with both at their juncture. It is rotated by the belt 55 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 51. The mixing-box is divided by a transverse partition 56, which permits any excess of material to flow over into the compartment behind the partition, which serves as an overflow-box and which is drained by the overflow-pipe 58.

59 is a stock-chest from which the cement solution is drawn by any suitable means, as the pump 60, through pipe 61 and delivered to stock-pipe 31. The overflow-pipe 58 returns the surplus pulp to this stock-chest.

The operation of my invention is as follows: The apparatus being set in motion, a felted layer of asbestos fiber will be deposited upon the wire-cloth cylinder and in turn will be transferred to the endless felt 2 in the ordinary and well-understood manner. As this layer of material passes under the apron 51 a suitable quantity of finely-divided cement in solution is deposited upon it. 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 up on 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 39, which squeeze the moisture out of it, and thence around the tightening-roll 6 back to the wire-cloth cylinder, where it again has deposited upon it the film of asbestos, to which cement is subsequently added, as before described.

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, and the ease of regulation of the raw materials and of the machine and process at every point of operation, 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. In case more or less water were needed to dissolve and set the dried cement, the action of the suction-boxes may be modified or dispensed with and, if desired, more water added to the pulp in the mixing-tank or to the cement in the mixing-box 30.

Having therefore described my invention, I claim—

1. In a machine for making millboard and similar substances, the combination with the ordinary mechanism of a "wet" paper-making machine including an endless band of felt on which a felted film of fibers is collected, of means adapted to deliver upon the upper strand of said endless felt a cement solution.
2. In a machine for making millboard and similar substances, the combination with the ordinary mechanism of a "wet" paper-making machine including an endless band of felt on which a felted film of fibers is collected, of means adapted to deliver upon the upper strand of said endless felt a cement solution, said means comprising a distributing-trough, a graduated sluiceway therein, approximating in length the width of the felt, and conveying means from said sluiceway to the upper section of the endless felt.
3. In a machine for making millboard and similar substances, the combination with the ordinary mechanism of a "wet" paper-making machine including an endless band of felt on which a felted film of fibers is collected, of means adapted to deliver upon the upper

strand of said endless felt a cement solution, 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 a point over the upper section of the endless felt.

4. In a machine for making millboard and similar substances, the combination with the ordinary mechanism of a "wet" paper-making machine including an endless band of felt on which a felted film of fibers is collected, of means adapted to deliver upon the upper strand of said endless felt a cement solution, 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 a point over the upper section of the endless felt, said apron having upturned sides spaced apart a distance equal to the width of the web to be formed.

5. In a machine for making millboard and similar substances, the combination with the ordinary mechanism of a "wet" paper-making machine including an endless band of felt on which a felted film of fibers is collected, of means adapted to deliver upon the upper strand of said endless felt a cement solution, 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 a point over the upper section of the endless felt, together with a distributing-roll located over the felt near a point where the cement solution is delivered to it.

6. In a machine for making millboard and similar substances, the combination with the ordinary mechanism of a "wet" paper-making machine including an endless band of felt on which a felted film of fibers is collected, of means adapted to deliver upon the upper strand of said endless felt a cement solution,

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 a point over the upper section of the endless felt, together with a distributing-roll located over the felt near a point where the cement solution is delivered to it, said roll revolving 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 with the ordinary mechanism of a "wet" paper-making machine including an endless band of felt on which a felted film of fibers is collected, of means adapted to deliver upon the upper strand of said endless felt a cement solution and means disposed between the point of such delivery and the press-rolls of the "wet" machine for varying the amount of water in the mixture formed on the felt.

8. In a machine for making millboard and similar substances, the combination with the ordinary mechanism of a "wet" paper-making machine including an endless band of felt on which a felted film of fibers is collected, of means adapted to deliver upon the upper strand of said endless felt a cement solution and means disposed between the point of such delivery and the press-rolls of the "wet" machine for varying the amount of water in the mixture formed on the felt, said last-mentioned means comprising a series of suction-boxes, located under the upper strand of felt.

Signed at Brooklyn, New York, this 8th day of June, 1906.

WILLIAM SILLMAN.

Witnesses:

CHAS. CURNOW,
E. N. ROBER.

Corrections in Letters Patent No. 840,387.

It is hereby certified that in Letters Patent No. 840,387, granted January 1, 1907, upon the application of William Sillman, of New York, N. Y., for an improvement in "Machines for Making Millboard," errors appear in the printed specification requiring correction, as follows: On page 1, line 65, the numeral "7" should read 6, and same page, the words "roll mounted in movable journal-bearings 10," comprising line 67, should be stricken out and inserted as a line after line 70 as now numbered, same page; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 22d day of January, A. D., 1907.

[SEAL.]

F. I. ALLEN,
Commissioner of Patents.

strand of said endless felt a cement solution, 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 a point over the upper section of the endless felt.

4. In a machine for making millboard and similar substances, the combination with the ordinary mechanism of a "wet" paper-making machine including an endless band of felt on which a felted film of fibers is collected, of means adapted to deliver upon the upper strand of said endless felt a cement solution, 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 a point over the upper section of the endless felt, said apron having upturned sides spaced apart a distance equal to the width of the web to be formed.

5. In a machine for making millboard and similar substances, the combination with the ordinary mechanism of a "wet" paper-making machine including an endless band of felt on which a felted film of fibers is collected, of means adapted to deliver upon the upper strand of said endless felt a cement solution, 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 a point over the upper section of the endless felt, together with a distributing-roll located over the felt near a point where the cement solution is delivered to it.

6. In a machine for making millboard and similar substances, the combination with the ordinary mechanism of a "wet" paper-making machine including an endless band of felt on which a felted film of fibers is collected, of means adapted to deliver upon the upper strand of said endless felt a cement solution,

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 a point over the upper section of the endless felt, together with a distributing-roll located over the felt near a point where the cement solution is delivered to it, said roll revolving 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 with the ordinary mechanism of a "wet" paper-making machine including an endless band of felt on which a felted film of fibers is collected, of means adapted to deliver upon the upper strand of said endless felt a cement solution and means disposed between the point of such delivery and the press-rolls of the "wet" machine for varying the amount of water in the mixture formed on the felt.

8. In a machine for making millboard and similar substances, the combination with the ordinary mechanism of a "wet" paper-making machine including an endless band of felt on which a felted film of fibers is collected, of means adapted to deliver upon the upper strand of said endless felt a cement solution and means disposed between the point of such delivery and the press-rolls of the "wet" machine for varying the amount of water in the mixture formed on the felt, said last-mentioned means comprising a series of suction-boxes, located under the upper strand of felt.

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