F. M. CHAPMAN.

MACHINE FOR SCREENING PAPER.

APPLICATION FILED JAN. 29, 1919.

1,437,720.

Patented Dec. 5, 1922.

2 SHEETS—SHEET 1.

Fig. 1.

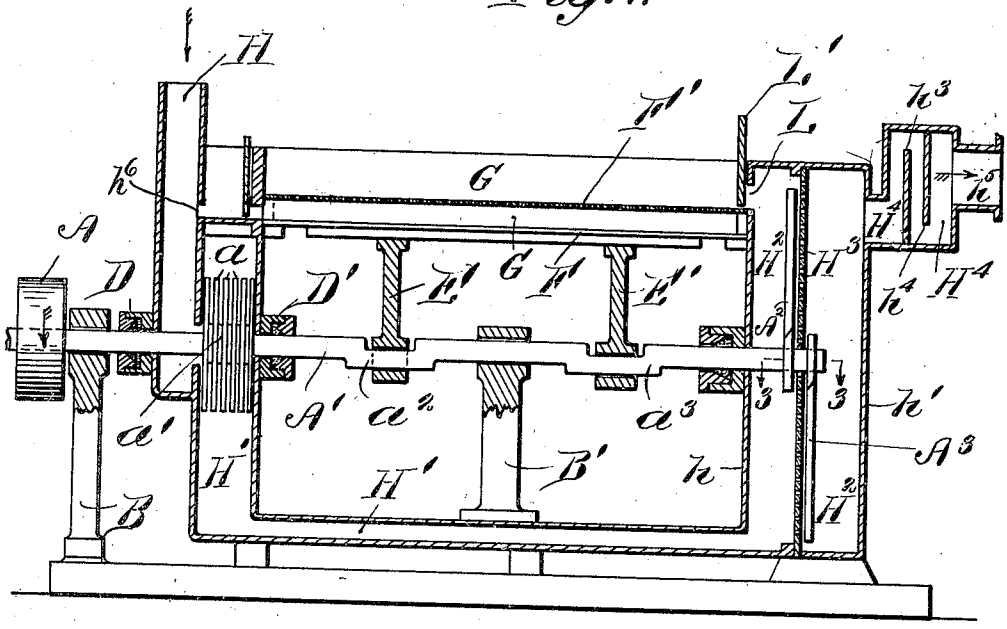


Fig. 4.

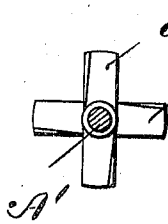


Fig. 2.

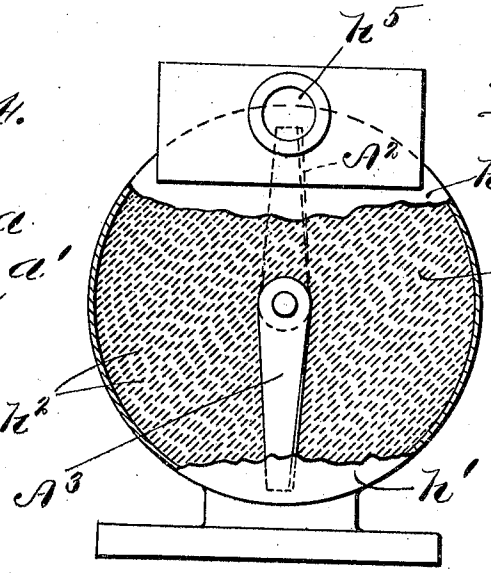
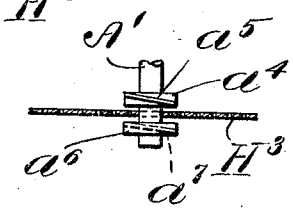


Fig. 3



Inventor

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2 SHEETS—SHEET 2.

Fig. 5

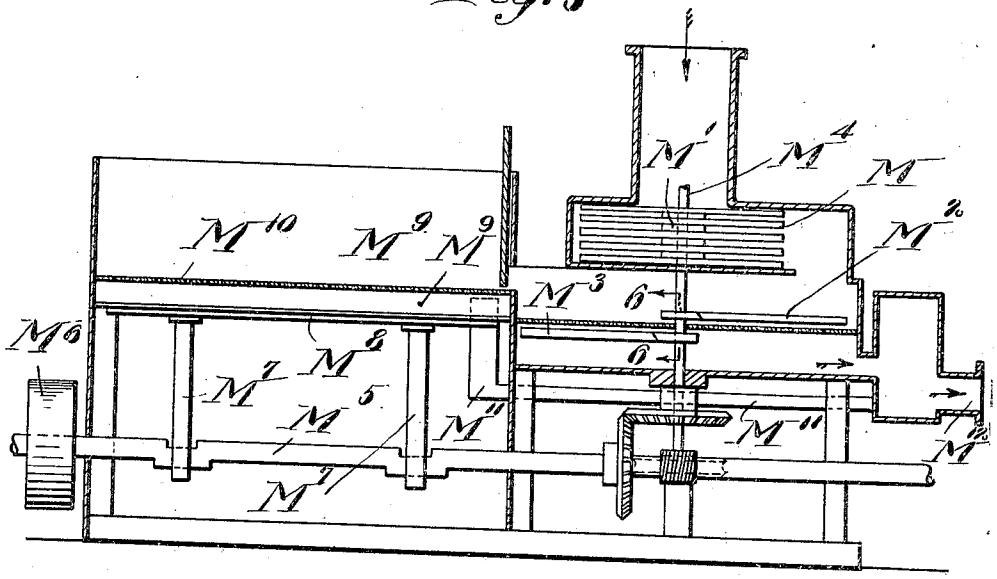


Fig. 7

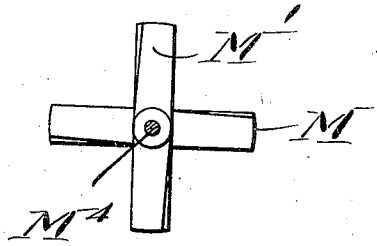
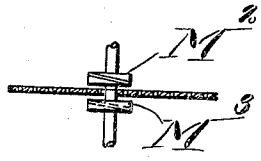


Fig. 6.



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UNITED STATES PATENT OFFICE.

FRANK M. CHAPMAN, OF NASHUA, NEW HAMPSHIRE, ASSIGNOR TO ELIE W. LABOMBARDE, OF NASHUA, NEW HAMPSHIRE.

MACHINE FOR SCREENING PAPER.

Application filed January 29, 1919. Serial No. 273,841.

To all whom it may concern:

Be it known that I, FRANK M. CHAPMAN, a citizen of the United States, and resident of Nashua, in the county of Hillsborough and State of New Hampshire, have invented a new and useful Machine for Screening Paper, of which the following is a specification.

My invention relates primarily to the treatment of paper stock for the purpose of separating the coarse portions from the fine.

A feature of my invention consists in forcing the stock into adjacency to a screen by means of a pump, for example, and in the preferred form I provide means, such as paddles, for example, to push the stock back and forth through the screen, these paddles being preferably oppositely arranged and working in unison with the pump.

Another feature is in the combination with said pushing means of another screen to give further treatment to some of the stock.

Other features will be pointed out below.

In the drawings—

Figure 1 is an elevation, partly in section of a machine embodying my invention;

Figure 2 is an end view of the same, partly broken away;

Figure 3 is a detail, partly in section on line 3—3 of Figure 1;

Figure 4 is a side view of the pump;

Figure 5 is an elevation, partly in section, of a modification;

Figure 6 is a detail, partly in section on line 6—6 of Figure 5; and

Figure 7 is a plan of the pump of Figure 5.

Power is applied to pulley A fixed on shaft A′, the latter having fixed to it a pump comprising any suitable number of bevelled blades a alternating with bevelled blades a', said shaft having fixed to it bevelled paddles A^2 and A^3. Posts B and B′ furnish bearings for the shaft and stuffing boxes D and D′ are provided to prevent leakage of the material. Shaft A′ has eccentric portions a^2 and a^3 having pivotal connection with connecting rods E and E′ which are operatively connected to diaphragm F so as to move the latter toward and from screen F′ which is fixed in chamber G.

The stock enters the machine at inlet H which leads to the pump and is then forced by the pump through passage H′ to what is in effect a screening chamber H^2 the side walls of which are h and h' and in this chamber is arranged screen H^3 having a number of longitudinal openings h^2 which I much prefer to openings of any other shape. Leading from chamber H^2 is outlet chamber H^4 provided with a partition h^3 extending upwardly from the bottom and partition h^4 extending downwardly from the top, this staggered arrangement increasing very materially the efficiency of the machine and preparing the stock for outlet in proper form through opening h^5 to a suitable slide or spout.

The paddle A^2 has a hub portion a^4 fixed to shaft A′ and a blade portion a^5 bevelled or inclined to the screen H^3 at one side thereof at about an angle of 15 degrees and paddle A^3 has a hub a^6 fixed to the shaft and a blade portion a^7 bevelled or inclined to the screen H^3 at the other side thereof at about an angle of 15 degrees, said blades extending radially from the shaft in opposite directions. This construction in combination with the screen provides a pushing and suction effect back and forth through the screen and has a much larger capacity and gives much better quality of work than was possible with any prior machine and results in preventing clogging and in very efficient separation of the coarse from the fine portions of the stock, the pump acting in unison with the paddles and forcing the stock continuously toward the screen H^2, the pulley A rotating in the direction of the arrow in Figure 1 and care being taken in the particular form shown not to allow the pulp level to rise above opening h^6.

From chamber H^2 there is an outlet L controlled by a suitable gate L′ which is occasionally opened to permit stock to pass from chamber H^2 onto screen F′ through which some of the stock is passed by suction action of the diaphragm F, passing gradually to the opening h^6 and thence to inlet H and down to the pump, the diaphragm working in unison with the shaft A′. As occasion requires the operator may scoop up or otherwise remove the refuse stock from screen G.

In Figures 5 to 7 the pump blades M and M′ and paddles M^2 and M^3 are similarly fixed on a vertical shaft M^4 which has a bevel gear connection with shaft M^5 carrying pulley M^6, said shaft operating connecting rods M^7 which operate diaphragm M^8

which is the lower movable wall of chamber M^9, some of the material, as in the other form, passing through screen M^{10}, and thence through conduit M^{11} to the outlet M^{12} instead of to the pump as in the other form.

Among the advantages of my machine I may point out that it has greater capacity than any prior machine; that it separates the fibers more thoroughly; that it screens the stock more cleanly because a finer plate or screen may be used; that less power is required to operate it and that clogging is prevented by the oppositely arranged paddles, each forcing the stock through the adjacent screen.

What I claim is:

1. A machine of the character described comprising a screen; means to pump the stock into adjacency to said screen; and means to push the stock through said screen.

2. A machine of the character described comprising a screen; means to push the stock through the screen in one direction; and means to push the stock through the screen in the other direction.

3. A machine of the character described comprising a screen; means to pump the stock into adjacency to said screen; means to push the stock through the screen in one direction; and means to push the stock through the screen in the other direction.

4. A machine of the character described comprising a screen; and means to push the stock through the screen in opposite directions including a shaft, a paddle at one side of the screen fixed to said shaft and extending radially thereof, and a second paddle at the other side of the screen, fixed to said shaft and extending radially thereof in a direction opposite to that of the first paddle.

5. A machine of the character described comprising a screen; and means to push the stock through the screen in opposite directions including a paddle at each side of the screen, each paddle being inclined to the screen; and means to rotate the paddles in unison.

6. A machine of the character described comprising a screen; means to push the stock through the screen in opposite directions including paddles at opposite sides of the screen, each paddle being inclined to the screen at an angle of substantially fifteen degrees; and means to rotate said paddles in unison.

7. A machine of the character described comprising a screen; a pump to force the stock into adjacency to said screen; and means to push the stock through the screen in opposite directions including a shaft, a paddle at one side of the screen fixed to said shaft and extending radially thereof and a second paddle at the other side of the screen fixed to said shaft and extending radially thereof in a direction opposite to that of the first paddle; and means to operate said pump and said paddles in unison.

8. A machine of the character described comprising a screen; a shaft; a pump on said shaft to force the stock into adjacency to said screen; a paddle at one side of said screen fixed to said shaft and extending radially thereof and being inclined to the screen at substantially an angle of fifteen degrees; and a second paddle at the other side of the screen fixed to said shaft and extending radially thereof in a direction opposite to that of the first paddle and being inclined to the screen at substantially an angle of fifteen degrees, said paddles being in suitable adjacency to said screen.

9. A machine of the character described comprising a chamber; a screen in said chamber; means to push the stock through said screen in two directions; an outlet from said chamber leading to another chamber; means to control access to said other chamber; and means to screen the stock in said other chamber.

10. A machine of the character described comprising a screening chamber; means to screen the stock in said chamber; an outlet chamber leading from said screening chamber; a partition extending upwardly from the bottom of said outlet chamber; and a partition extending downwardly from the top of said outlet chamber said partitions acting to guide the stock over the first partition and then under the second partition.

11. A machine of the character described comprising a screen having longitudinal slits and means to push the material in two directions through said slits.

12. A machine of the character described comprising a screen; and means to push the stock through the screen in opposite directions including a paddle at each side of the screen, one of said paddles being inclined to the screen, the advance edge being nearer to the screen than the rear edge and the other of said paddles being inclined to the screen and having its advance edge farther from the screen than its rear edge; and means to rotate the paddles in unison.

13. A machine of the character described comprising a power shaft; a screen; means operated by said shaft to push the stock through said screen in one direction; and means operated by said shaft to push the stock through said screen in the opposite direction.

14. A machine of the character described comprising a screen; rotary means to push the stock through said screen in one direction; and rotary means to push the stock through said screen in the other direction.

15. A machine of the character described comprising a vertical screen; rotary means to push the stock through said screen in one

direction; and rotary means to push the stock through said screen in the other direction.

16. A machine of the character described comprising a screen; means to pump the stock into adjacency to said screen; means to push the stock through the screen in one direction; and means to push the stock through the screen in the opposite direction, the pumping means and the pushing means being connected so as to operate in unison.

17. A machine of the character described comprising a screen; a pump having a series of bevelled blades alternating with another series of bevelled blades, said pump acting to force the stock into adjacency to said screen; and means to push the stock through said screen, said pump and said means being connected so as to operate in unison.

18. A machine of the character described comprising a screen; means to push the stock through said screen in one direction; means to push the stock through said screen in the other direction; a second screen; a diaphragm cooperating with said screen; and means to actuate said diaphragm, both of said pushing means and said actuating means being connected so as to operate in unison.

FRANK M. CHAPMAN.