

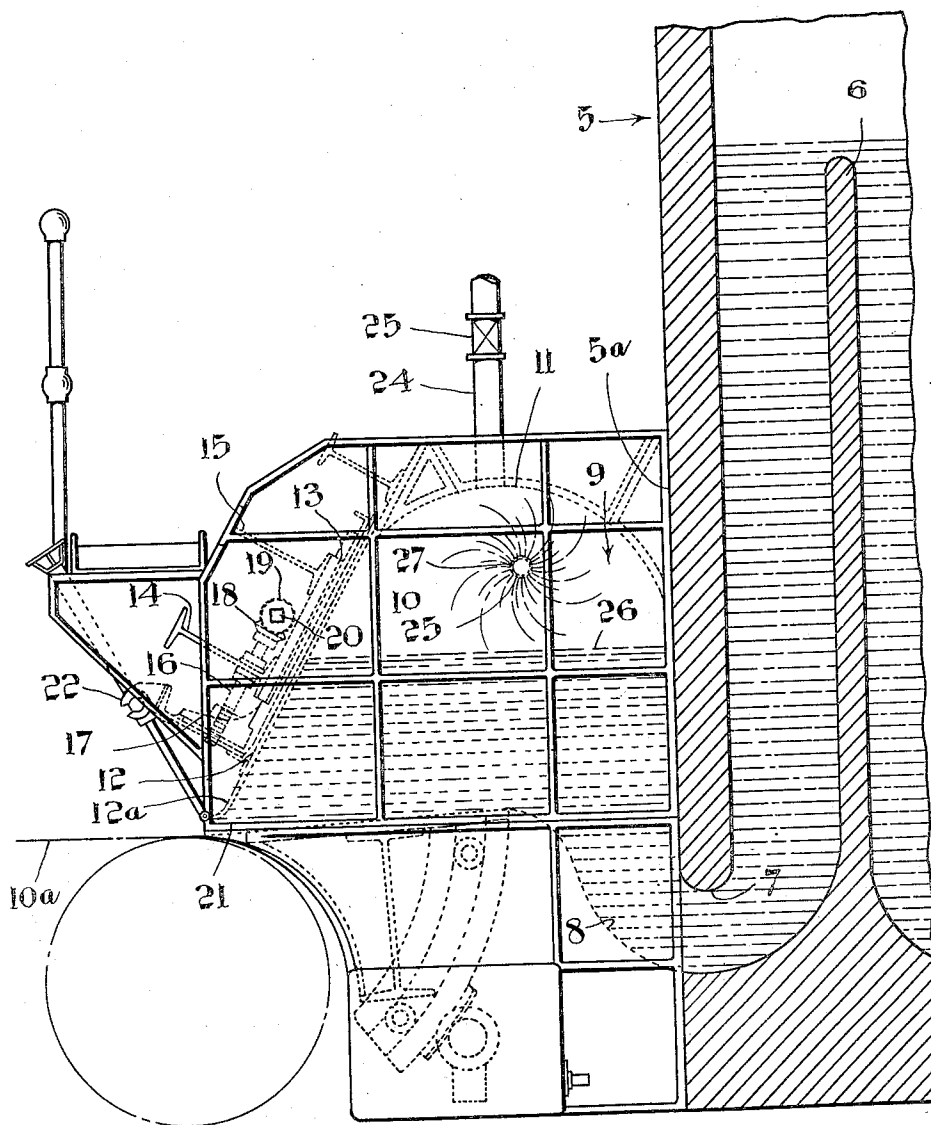
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PAPER MAKING MACHINE

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PAPER MAKING MACHINE

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5 Claims. (Cl. 92—44)

This invention relates to paper making machines and particularly to improved means for controlling the flow of stock from the head box to the forming wire.

In operating a Fourdrinier paper machine at high speeds the stock is caused to flow onto the forming wire at the requisite velocity by maintaining a high head of stock in a pond provided between the head box and the slice plate. This practice of maintaining a high pond of stock directly behind the slice plate is characterized by the existence of stagnant areas in which lumping of the stock is apt to occur and has other defects and disadvantages which are eliminated by the present invention.

According to this invention the stock is delivered from the head box into an enclosed pond chamber having its front wall formed by an adjustable slice plate under which the stock flows to the forming wire. Air pressure is established in the upper portion of the pond chamber to maintain the stock at a relatively low level behind the slice plate without diminishing the velocity of flow onto the forming wire as compared with the conventional practice of maintaining a high level of stock directly behind the slice plate. Another advantage resulting from the maintenance of air pressure in the upper portion of the enclosed pond chamber is that it keeps this portion of the chamber substantially clear of stock and provides a clear space for the mounting and operation of a shower pipe through which water may be introduced to wash down the walls of the chamber and to control the dilution of the stock.

Proceeding now to a more detailed description reference will be had to the accompanying drawing, wherein Fig. 1 is a side elevation of my invention as applied to a conventional Fourdrinier paper making machine.

Referring more particularly to the drawing, 5 designates a head box provided with the usual baffle 6 and stock outlet 7. The stock discharged through outlet 7 is delivered to the bottom inlet 8 of an enclosed pond chamber 9 having side walls 10 and a dome shaped top wall 11. In the present instance the rear wall of chamber 9 is formed by the front wall 5a of the head box 5. In some cases, however, the chamber 9 may be provided with an independent rear wall cast integral with the side walls 10 and the top wall 11. The front wall of chamber 9 is formed by an inclined slice plate 12 equipped with the usual flexible lip 12a. Plate 12 is slidable in a suitable guide structure 13 so as to vary the depth of the flow opening which is provided between the lip

12a and the bottom wall of chamber 9. This guide structure 13 is carried by I beams 14 and 15 which, in turn, are supported between the side walls 10.

The I beam 14 carries a plurality of rotatably mounted adjusting screws 16 having their lower ends threadedly engaged with a casting 17 fixed to the lower portion of the slice plate 12. The upper ends of screws 16 are equipped with bevel pinions 18 meshing with similar pinions 19 fixed to an operating shaft 20. By turning shaft 20 the slice plate 12 may be raised and lowered to regulate the depth of the flow opening provided between the lower edge of the lips 12a and the bottom wall 21 of the pond chamber 9. Suitable adjusting devices 22 are also provided to effect local flexure of the lip 12a at different points along its length so that fine adjustments with respect to varying the depth of the flow passage beneath the lip 12a may be obtained in addition to that resulting from operation of the screws 16.

It is not considered necessary to show or describe the adjusting means for the plate 12 and the lip 12a in greater detail since such means form no essential part of the present invention and may be more or less conventional.

The stock admitted to chamber 9 through inlet 8 is prevented from filling said chamber by reason of the fact that the upper portion of the chamber is filled with air under pressure, such air being introduced into the chamber through an air supply pipe 24 equipped with a pressure regulating valve 25. By varying the air pressure thus established in the upper portion of chamber 9, the head or depth of stock in said chamber may be controlled to give the optimum condition of velocity and turbulence immediately behind the outlet opening. The quantity and/or pressure of air maintained in the pond chamber 9 is regulated by means of the valve 25 to suit the speed of the paper machine and the head of stock maintained in the head box 5. This pressure is always such that the stock is permitted to rise above the outlet of chamber 9 but is prevented from completely filling said chamber. A rotary shower pipe 25, supplied with water under pressure from a suitable source (not shown), is rotatably mounted in chamber 9 above the level 26 of the stock and is provided with openings 27 through which water is directed against the top wall 11 and the upper portions of the front and rear walls of chamber 9 to clear these walls of any particles of stock adhering thereto. The shower pipe 25 may also be employed as a

means for controlling the dilution of the stock delivered to the forming wire.

The bottom wall 21 of the pond chamber 8 affords an apron over which the stock flows to the forming wire from the head box outlet 7. It will be noted that the rear portion of wall 21 is curved downwardly and rearwardly to form the bottom of the inlet 8.

Having thus described my invention, what I claim is:

1. In a paper making machine, a movable sheet forming element, a pond chamber of substantial vertical depth enclosed by top, bottom, front, rear, and side walls, said chamber being provided with stock inlet and outlet openings located a substantial distance below the top wall, means for supplying stock through said inlet so that the stock tends to rise in said chamber to a level above the top of the outlet, and means for introducing compressed air into the upper portion of said chamber for the purpose of controlling the depth and velocity of the stock immediately behind the outlet opening.

2. A paper machine as set forth in claim 1 including means for varying the superatmospheric pressure established in the upper portion of said chamber to suit different operating conditions.

3. In a paper making machine, a movable sheet forming element, a pond chamber enclosed by top, bottom, front, rear and side walls, said chamber being provided with stock inlet and stock outlet openings located a substantial distance below the top wall, means for supplying stock to said inlet so that the stock tends to rise to the top of said chamber, means for introducing compressed air into said chamber through an

opening located in the upper portion thereof to maintain the level of the stock in said chamber at a point above the stock outlet but substantially below the top wall of the chamber.

4. In a paper making machine, a movable sheet forming element, a pond chamber of substantial vertical depth enclosed by top, bottom, front, rear and side walls, said chamber being provided with stock inlet and outlet openings located a substantial distance below the top wall, means for supplying stock through said inlet so that the stock tends to fill said chamber, means for introducing compressed air into said chamber through an opening in the upper portion thereof to maintain the level of stock in said chamber at a point above the stock outlet but substantially below the top of the chamber, and a shower pipe mounted in the upper portion of said chamber so that, under normal operating conditions, the shower pipe is above the level of the stock.

5. In a paper making machine, a movable sheet forming element, a pond chamber of substantial vertical depth enclosed at the top, bottom, front, rear and sides, said chamber being provided with stock inlet and outlet openings located a substantial distance below the top thereof, a shower pipe mounted in the upper portion of said chamber, means for supplying stock to said inlet so that the stock tends to fill said chamber, means for introducing compressed air into the upper portion of the chamber to maintain the level of the stock at a point above the stock outlet but below said shower pipe, and means for controlling the air pressure established in said chamber by said air supplying means.

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