

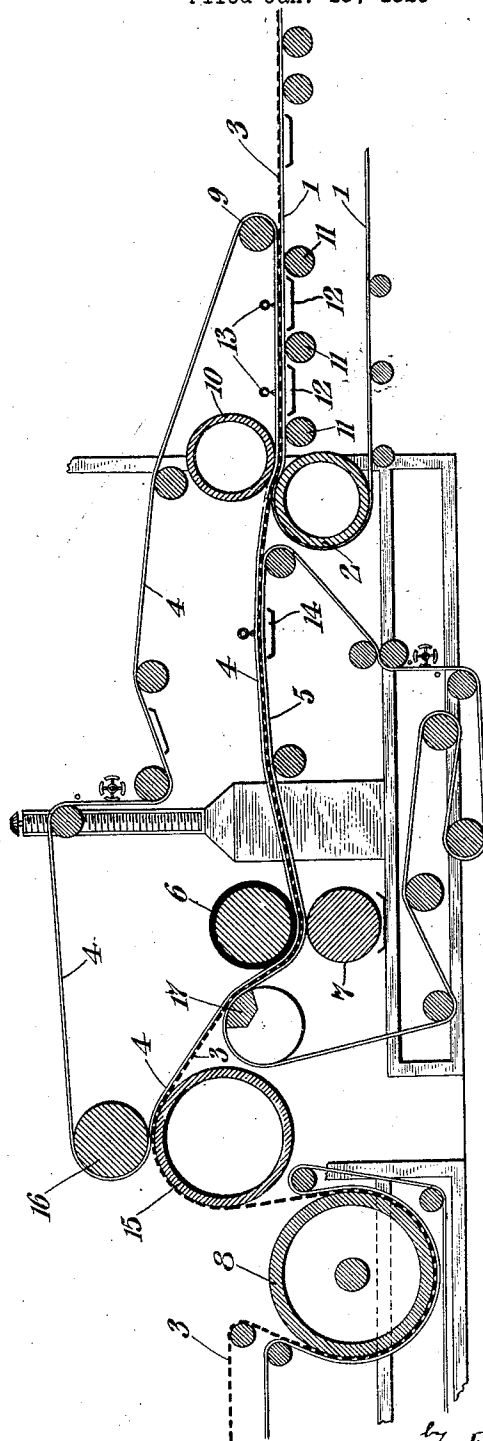
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PAPER MAKING MACHINE

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PAPER-MAKING MACHINE.

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The invention in certain of its aspects relates more particularly to a paper-making machine of the Fourdrinier type, wherein the stock is initially deposited upon a forming wire, and has for an object to provide a simple and efficient arrangement for removing water or moisture from the fibres while carried by the forming wire, and without injuring the newly formed paper web.

The invention also aims to carry the paper web along from the forming wire and through the press rolls without necessitating bends or undulations which are liable to injure the web, and to continually support the web in its travel from the forming wire to the drying section of the machine, thus eliminating any stretch or sag which might strain the fibres sufficiently to injure the bond between them.

One feature of the invention is the provision of a device to insure that the paper web will follow along properly with a felt apron which is employed to carry it from the press rolls to the drying section of the machine. Further objects and advantages of the invention will be in part obvious and in part specifically pointed out in the description hereinafter contained, which, taken in conjunction with the accompanying drawings, discloses a preferred embodiment thereof; such embodiment, however, is to be considered as merely illustrative of its principles. In the drawings:

The single figure is a diagrammatic longitudinal sectional view of certain parts of a paper-making machine constructed in accordance with the invention.

Referring to the drawing, I have disclosed a paper making machine of the Fourdrinier type having a forming wire 1 passing around a lower couch roll 2, the paper web 3 being initially deposited upon the forming wire in the usual manner, after which the web passes between upper and lower felt aprons 4 and 5 respectively, to upper and lower press rolls 6 and 7, and from thence to the driers 8.

In accordance with the present invention, the upper felt apron 4 is extended over to overlie the forming wire 1, and runs around a roller 9 which presses the felt apron into engagement with the upper surface of the paper web 3. An upper couch roll 10 is also employed, and this roll I prefer to locate slightly in advance of lower couch

roll 2, in such manner that its weight is partially carried by the lower couch roll and partially by the forming wire, thus relieving the forming wire to some extent from being pressed too tightly between the rolls, and more efficiently expressing moisture from the upper felt apron 4, to render it more certain that the web 3 will be carried along by and in contact with the upper felt apron from the couch rolls, instead of sagging and stretching, as would be the case if the web traveled along unsupported.

A plurality of rollers 11 underlie the forming wire 1 and serve to support the latter in the region where the felt apron 4 overlies the same.

During the time that the paper web 3 is supported between the forming wire and the felt apron 4, I withdraw water and moisture from underneath by means of one or more suction boxes 12 which underlie the forming wire 1. The suction is aided by gravity, being in a downward direction, and furthermore the removal of water in the above manner does not necessitate the bending of the paper web in such a way as to injure the bond between the newly deposited fibres, but it will be noted that the web travels along in a substantially flat condition which does not destroy the bond. The suction boxes also are relatively inexpensive and require only a small amount of power, as compared to other devices such as suction rollers, which latter would also require the bending of the paper web to make the suction effective.

I prefer also to employ in connection with the suction boxes above mentioned, one or more air blast pipes 13 which direct a downwardly-directed blast of air through the upper felt apron to augment the drying action of the suction boxes. This also may be done without injury to the paper web, since the latter is supported between the felt apron and forming wire at all points between the rolls 9 and 10, so that the fibres are not readily displaced. The partial drying of the paper web while upon the forming wire as above described tends to stabilize the fibres with their loadings in the body of the web, and render it less likely that the same will be squeezed out at the press rolls.

The paper web is then carried along from the couch rolls by the upper felt apron 4 into connection with the lower felt apron 5,

and between the press rolls. To relieve the lower felt apron from an excess of water at the press rolls, I prefer to employ a suction 14 under the lower felt apron 5 adjacent its junction point with the upper felt apron and paper web.

I also prefer to extend the upper felt apron 4 beyond the press rolls, and bring it over into contact with a separating roll 15, or first drier, the upper felt apron running around a roll 16 in the present instance for the above purpose. The lower felt apron 5 also follows along with the upper felt apron for a short distance beyond the press rolls, and passes around a blow roll 17 from within which a blast of air is directed on to the paper web 3 to insure that the latter will be carried along by and in contact with the upper felt apron 4. Thus the paper web will be adequately supported against stretch or sag at this point in its travel.

While a specific embodiment of the invention has been described, it will be obvious that many changes may be made therein without departing from its principles, as defined in the appended claims.

I claim:

1. A paper-making machine comprising a forming wire, a felt apron overlying a substantially flat section of the same to hold a length of the paper web in substantially flat condition against the forming wire, and a suction box disposed beneath said section of the forming wire to withdraw water while the web is held between the felt apron and the forming wire.

2. A paper-making machine comprising a forming wire, a felt apron overlying a substantially flat section of the same to hold a length of the paper web in substantially flat condition against the forming wire, and means for directing a blast of air under pressure down onto the overlying part of the felt apron.

3. A paper-making machine comprising a forming wire, a felt apron overlying a substantially flat section of the same to hold a length of the paper web in substantially flat condition against the forming wire, a suction box disposed beneath said section of the forming wire to withdraw water while the web is held between the felt apron and the forming wire, and means for directing a blast of air down onto the overlying part of said felt apron to act in conjunction with said suction box.

4. A paper-making machine comprising a forming wire, press rolls, an upper felt apron passing between said press rolls and also overlying a substantially flat section of the

forming wire to hold a length of the newly formed paper web in substantially flat condition against the forming wire, a suction box disposed beneath said section of the forming wire to withdraw water while the said web is held between the upper felt apron and the forming wire, a lower felt apron meeting the upper felt apron at a point between the forming wire and the press rolls, whereby the upper felt apron leads the paper web into contact with said lower felt apron, and a suction device underlying said lower felt apron adjacent its above-mentioned point of meeting with the upper felt apron.

5. A paper-making machine comprising press rolls with upper and lower felt aprons passing therebetween, said upper felt apron also extending over into contact with the first roll of the drier section of the machine, said lower felt apron also extending along with the upper felt apron somewhat beyond the press rolls, and means for directing a blast of air onto the above-mentioned extending portion of the lower felt apron to cause the paper web to follow the upper felt apron.

6. A paper-making machine comprising press rolls with upper and lower felt aprons passing therebetween, said upper felt apron also extending over into contact with the first roll of the drier section of the machine, said lower felt apron also extending along with the upper felt apron somewhat beyond the press rolls, and a blow roll around which the above-mentioned extending portion of the lower felt apron passes.

7. A paper-making machine comprising a forming wire, a felt apron overlying a substantially flat section of the same to hold a length of the paper web in substantially flat condition against the forming wire, and means for withdrawing water in a downward direction through the forming wire from the paper web while the latter is held between the felt apron and the forming wire.

8. A paper-making machine comprising press rolls with upper and lower felt aprons passing therebetween, said upper felt apron also extending over into contact with the first roll of the drier section of the machine, and means for directing a blast of air through the lower felt apron to cause the paper web to follow the upper felt apron after the web leaves the press rolls.

In testimony that I claim the foregoing, I have hereunto set my hand this 5th day of January, 1925.

JOHN D. TOMPKINS.