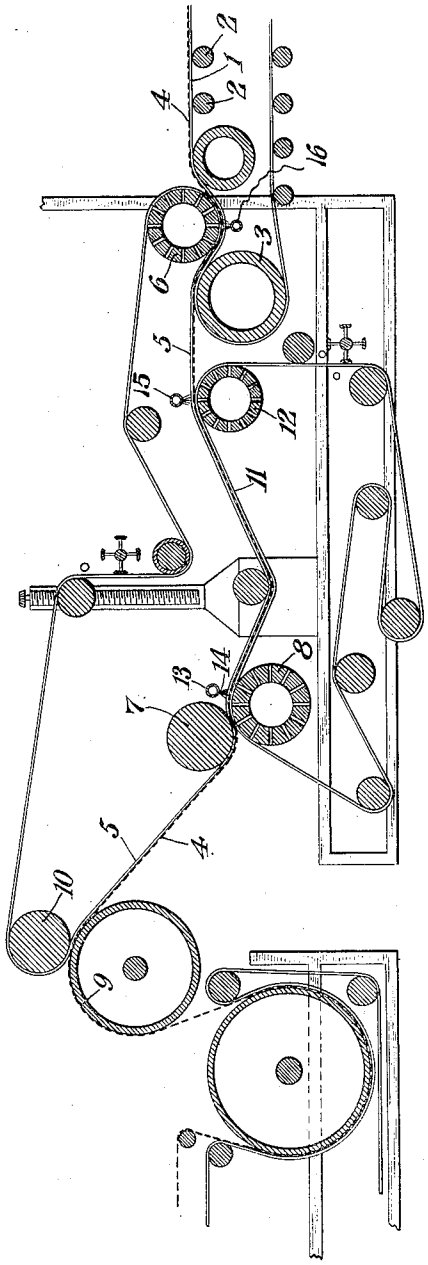
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J. D. TOMPKINS

PAPER MAKING MACHINE

Filed April 11, 1922



John D. Tompkins Inventor

By his Attorneys

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UNITED STATES PATENT OFFICE.

JOHN D. TOMPKINS, OF VALATIE, NEW YORK.

PAPER-MAKING MACHINE.

Application filed April 11, 1922. Serial No. 551,575.

To all whom it may concern:

Be it known that I, JOHN D. TOMPKINS, a citizen of the United States, a resident of Valatie, in the county of Columbia and State of New York, have invented a certain new and useful Paper-Making Machine, of which the following is a specification.

The invention has for an object to facilitate or improve the operation of extracting water from the fibers of a paper web as it passes through a paper making machine, particularly at the time when such fibers are carried by the forming wire, and in such manner that the removal of water or moisture from the fibers will not displace the same from proper position.

Another object of the invention is to utilize the step of removing water or moisture as above mentioned, to assist in causing the web to adhere properly to the felt which is relied upon to carry the web along to parts of the machine which are to perform further operations thereon.

Other 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 connection with the accompanying drawings, discloses a preferred embodiment thereof; such embodiment, however, is to be considered merely as illustrative of its principle. In the drawings—

The single figure is a diagrammatic vertical longitudinal section showing a paper making machine adapted to operate in accordance with the invention.

Referring to the drawing, the particular type of paper making machine illustrated, embodies a paper web forming means, comprising a forming wire 1 running over a plurality of small rolls 2, and around a lower couch roll 3. The newly formed paper web 4 is carried in the first instance upon forming wire 1, and is transferred therefrom to a felt apron 5, in the present instance the upper felt apron, which latter is pressed into engagement with the paper web 4 by means of an upper couch roll 6; the upper felt apron passes between upper and lower press rolls 7 and 8 respectively, and as shown also serves to carry the paper web from the press rolls to the first roll 9 of a series of dryers, by passing around a roller 10 which presses against roll 9. A lower felt apron 11 passes over a roller 12 and between press rolls 7 and 8, and thus as the paper web is fed to the press rolls it is held between the felt aprons 5 and 11. As shown, the lower press roll 8 is of the suction type, and as the paper web 4 passes over lower press roll 8, it is also subjected to a blast of compressed air supplied by suitable means, such as a pipe 13 having perforations 14 therein directed toward the paper web. The suction of roll 8 and the air blast serve to assist in the operation of extracting water or moisture from the web, and preferably the roll 12 is also made of the suction type, and an air blast employed in connection therewith, as by means of a pipe 15, similar to the pipe 13 previously described.

The amount of moisture which can be drawn from the paper web when the latter is held between felt aprons, or the rate at which moisture can be withdrawn therefrom, is necessarily limited owing to the fact that the felt aprons are not of such open texture as to permit the free and unimpeded passage of the air blast therethrough. According to the present invention, I subject the paper web to the action of an air blast at a time when the web is still carried by the forming wire 1, the meshes or interstices of the forming wire being relatively large or open, and permitting a relatively free passage of the air blast therethrough. As shown, this air blast is supplied by means of a pipe 16, similar to the pipe 13 previously described, the pipe 16 being preferably located underneath web 4, and directing the air blast upwardly through the forming wire 1.

I also prefer to subject the paper web to the air blast passing through the forming wire, at a time when the opposite surfaces of the web are adequately supported. The paper fibers may be easily displaced in the stage at which they are carried by the forming wire, but if supported by the forming wire on one side, and also properly supported on the other side, the danger is avoided that the air blast might blow the fibers out of position. In the present instance, the pipe 16, which supplies the air

blast as above-mentioned, is positioned beneath the upper couch roll 6, and thus the paper web 4 is supported on its upper side by felt apron 5 to prevent the air blast from blowing the fibers out of position, as above-mentioned. Preferably the upper couch roll 6 is of the suction type to cooperate with the air blast pipe in extracting more moisture from the web.

Furthermore, if felt apron 5 be employed to carry the paper web along from the couch rolls, as is the case with the machine illustrated, the action of the air blast from pipe 16 also makes it more certain that the web will separate from the forming wire and adhere properly to the felt apron when the latter passes away from the forming wire.

In some instances, particularly where the machine is being used for the manufacture of papers of light weight, the extraction of water from the newly formed paper web when carried by the forming wire, in conjunction with the further step of removing water from the web and both felt aprons, by means of the suction roll 12 in combination with the air blast issuing from pipe 16, will render unnecessary the use of a lower press roll 8 of the suction type, thus reducing the expense of the suction roll and the amount of power consumed in driving this part of the machine. The effect of the dry air blast upon the upper felt apron 5 is to make this felt apron relatively dry, and when the two felt aprons pass between press rolls 7 and 8, the blotting or absorptive properties of the felt aprons are sufficient to take up the necessary amount of water remaining in a paper web of light weight, even though plain press rolls be employed, and the machine run at high speed.

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 principle, as defined in the following claims.

I claim:

1. The method of making paper which comprises forming a paper web upon a member having relatively large openings therein, directing an air blast through the openings in said member and on to the web to remove moisture therefrom, and maintaining a supporting surface in engagement with the side of the web opposite to the side which engages the forming member to prevent the blast from imparting movement to the web as a whole, at the time when the air blast is being applied thereto, and later removing the web from the forming wire.

2. The method of making paper which comprises forming a paper web upon a forming wire, maintaining an upper felt apron in contact with the side of the web opposite to the side which engages the forming wire, and passing a blast of air through the forming wire to the paper web while the latter is held between the forming wire and the felt apron.

3. A paper making machine comprising a member having openings therein and adapted to form a web of paper upon its surface, a supporting means for the web adapted to engage the same on the side thereof opposite from the forming wire to prevent the blast from imparting movement to the web as a whole, means for projecting an air blast through the forming member and toward said supporting means, said supporting means acting later to remove the web from the forming member.

4. A paper making machine comprising a forming wire, a felt apron passing over the surface of said forming wire, and means disposed beneath said forming wire adapted to project an air blast upwardly through the forming wire, and against said felt apron.

5. A paper making machine comprising a forming wire, a lower couch roll associated therewith, an upper couch roll located in advance of said lower couch roll, a felt apron passing around said upper couch roll and over said forming wire and lower couch roll, and means disposed beneath the forming wire and said upper couch roll for projecting an air blast upwardly through the forming wire toward the upper couch roll.

6. The combination set forth in claim 5, wherein said upper couch roll is of the suction type.

7. A paper making machine comprising a couch roll, a forming wire passing over the same, and means located in advance of the couch roll for directing an air blast upwardly through said forming wire from underneath.

8. The method of making paper which comprises forming a paper web upon a member having relatively large openings therein, maintaining an upper felt apron in contact with the exposed side of the web, leading the web between the upper felt apron and a lower felt apron to press rolls, and removing water by passing an air blast through the web while the latter is held between the forming member and the felt apron, and also subjecting the paper web and the upper and lower felt aprons to an air blast in advance of the press rolls.

9. The combination set forth in claim 5 together with press rolls, a lower felt apron adapted to cooperate with said upper felt apron to lead the paper web through the press rolls, and means in advance of the press rolls for subjecting both of said felt aprons to an air blast.

10. The method of making paper which comprises forming a paper web, leading a felt apron into contact with one side of the

web, extracting water from said web and felt apron by applying an air blast to the exposed side of the web, leading the web between said felt apron and another felt apron to press rolls, and removing further water from both of said felt aprons and web by applying a further air blast to the exposed side of said first-mentioned felt apron toward the web and the remaining felt apron.

In testimony that I claim the foregoing I have hereunto set my hand this 31st day of March, 1922.

JOHN D. TOMPKINS.