

1,018,450.

W. E. SHEEHAN.
PAPER MAKING MACHINERY.
APPLICATION FILED SEPT. 7, 1909.

Patented Feb. 27, 1912.

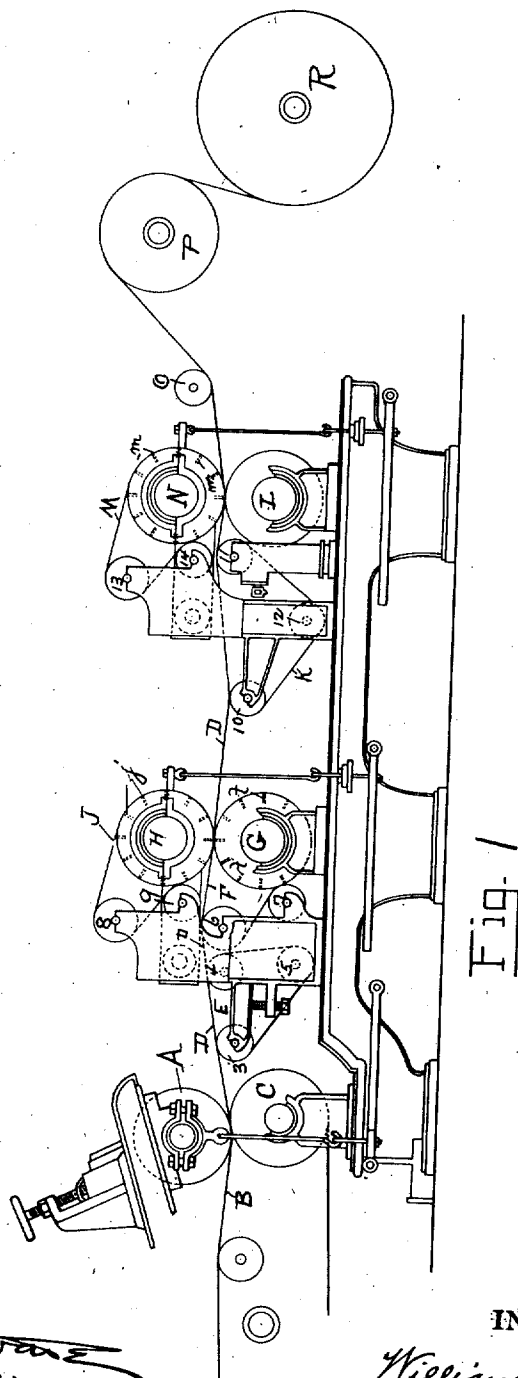


Fig. 1

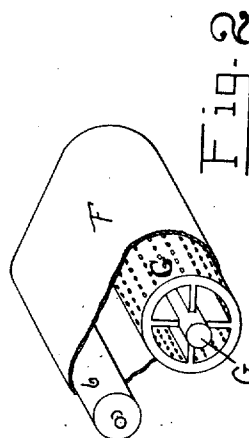


Fig. 2

WITNESSES:

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WILLIAM E. SHEEHAN, OF ALBANY, NEW YORK.

PAPER-MAKING MACHINERY.

1,018,450.

Specification of Letters Patent.

Patented Feb. 27, 1912.

Application filed September 7, 1909. Serial No. 516,435.

To all whom it may concern:

Be it known that I, WILLIAM E. SHEEHAN, a citizen of the United States, residing at the city of Albany, in the county of Albany and State of New York, have invented certain new and useful Improvements in Paper-Making Machinery, of which the following is a specification.

My invention relates to paper making machinery, and the object of my invention is to provide a paper making machine in which the water may be removed from the web of paper quickly, effectively and economically, together with such elements and combinations as are hereinafter more particularly set forth and claimed. I accomplish these objects by means of the mechanism illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation. Fig. 2 a perspective detail view, with parts broken away, of the perforated roll and endless apron.

Similar letters refer to similar parts throughout the several views.

I have shown a Fourdrinier type of paper making machine in which the couch roll, A, is mounted in the usual manner above the wire, B, which passes over the roll C, and upon which the paper stock, D, is deposited, and which is taken from the couch roll, A, and laid upon a carrier, E, which carrier passes over the rolls, 3, 4 and 5. The web of paper passing from the carrier, E, to the apron, F. The apron F passes over the roller 6 and also over the perforated press roll G, making an endless band of thick, porous, fibrous material, through which the water will pass, finding vent in the perforated press roll G and in the space between the perforated roll C and the roll 6. A squeeze roll, 7, is mounted to press against the apron F, for the purpose of causing the apron when it approaches the roller 6 to have a portion of the water forced out of it. Above the press roll G I place a similar press roll H about which is a similar apron, J, passing over a roller 8, and provided with a squeeze roll 9.

The water will be forced from the web of paper through the apron, J, into the press roll H, passing through the perforations, *j*, as well as through the apron F and perforations, *f*, in the press roll G. After passing between the press rolls H and G the web D will pass to the carrier, K, similar to the carrier, E, which carrier passes over the

solid press rolls 10, 11 and 12, and then comes in contact with the hard or solid press roll L and with the apron M, placed about the perforated press roll N and over the roll 13. The perforated press roll N, apron M and roll 13 being similar in construction and operation to the press roll G, apron F and roll 6. The moisture will be taken up by the apron M, which will be drained by the perforations, *n*, in the roll and pass out the ends of the roll. The apron being squeezed by the squeeze roll 14. After leaving the press rolls N and L the web passes to the guide roll O, going over the roll P and under the drying cylinder R in the usual manner. I do not, however, limit myself to the use of or number of combinations of rolls for pressing the water out of the web of paper, nor to the location of such rolls as indicated in the drawings and described herein.

My perforated roll covered with a very porous apron, thick so that the pressure of the water against the perforated periphery shall not result in spotting the paper, and which will permit of the ready passage of the fluid therethrough and which is arranged so that there is an air passage between the apron and the small roller, provides a means for causing a ready and rapid, as well as positive and effective means for eliminating the water from the web of paper and at the same time enables me to use, instead of a long expensive felt a short inexpensive jacket of much cheaper, as well as much more effective, material.

The rapidly revolving press rolls create a draft of air at the place of meeting between the two rolls and by my arrangement this air, which naturally rises, will pass through the porous apron and carry the moisture from the paper through the apron to the interior of the perforated roll. For this reason I place the perforated roll above the solid roll, and although in the first press I have shown two perforated rolls with their corresponding porous covering, it is the upper one, H, which I depend upon for taking out the larger amount of moisture, and use the lower one simply as an auxiliary.

The endless fibrous aprons, F and M, take the wet web of paper through the nip of the perforated rolls. Instead of the water passing through an open woven felt, as heretofore and down on to the periphery

of the bottom solid roll, this water passes into the top endless band or apron and into the perforated hollow roll and is carried away at the ends of the roll. The moisture or water passes upward readily through the fibrous apron because of its great porosity and also because the roll is perforated and the centrifugal motion of the rolls causing air pressure, the air and moisture finding the point of least resistance, which is through the roll. The water is thus prevented from lying on top of the bottom roll and causing the paper to be crushed or otherwise injured, as heretofore.

15 In my preferred arrangement the wet paper does not come in contact with the wet metal roll in the first press, and I thereby eliminate a large percentage of waste now existing by the paper adhering to the metal roll, because the paper will not so readily adhere when it comes in contact with the fibrous apron. Another great advantage obtained in the use of the perforated roll and fibrous apron is that it permits the use of a closer, heavier, matted fibrous material which will draw and absorb instead of press the large amount of water through the paper down through the woven felt and onto the periphery of the bottom roll, where the paper is liable to be crushed.

I consider important that feature of my invention which permits the air and water to pass out of the paper through the perforated roll and out the end of the rolls instead of down the outside periphery of the roll as in the old method.

My perforated roll is partly open, has no jacket which covers it snugly and the perforations are large, permitting the greatest opportunity for the free passage of air and water from the apron. I obtain a diffusion of air and water upward through the endless porous apron, and a uniform diffusion of the moisture so that at the pinch of the rolls, where the paper passes, the paper will not become spotted, that is the large perforations in the roll will not

leave one spot in the paper more moist than another. Of course the size of the perforations, thickness of the apron and the degree of porosity of the material determines the rapidity of drainage and absorption, which may be regulated as desired.

I do not limit myself to the use of a one piece apron, as I may of course unite or place side by side a number of aprons, each passing over the same perforated roll.

What I claim as my invention and desire to secure by Letters Patent is:

1. In a paper making machine, a carrier comprising a felt; rollers suitably mounted, over which said felt passes; an apron adapted to receive the paper from the carrier and conduct it between two rolls, one of which is perforated; aprons passing around portions of each of said rolls; solid rollers for supporting each of said aprons respectively; squeeze rollers mounted in connection with each of said aprons and said rolls, so arranged and connected up that the web of paper will have the water pressed from it by the rolls and the drainage delivered at the ends of said perforated roll.

2. In a paper making machine, a carrier comprising a felt; rollers suitably mounted, over which said felt passes; an apron adapted to receive the paper from the carrier and conduct it between two perforated rolls, one above the other; aprons passing around portions of each of said perforated rolls; solid rollers for supporting each of said aprons, respectively; squeeze rollers mounted in connection with each of said aprons and said perforated rolls, so arranged and connected up that the web of paper will have the water pressed from it by the perforated rolls and the drainage delivered at the ends of said perforated rolls.

In testimony whereof I have affixed my signature in presence of two witnesses.

WILLIAM E. SHEEHAN.

Witnesses:

FREDERICK W. CAMERON,
LOTTIE PRIOR.