P. W. HUDSON.
PAPER-MACHINE.

No. 195,821. Patented Oct. 2, 1877.

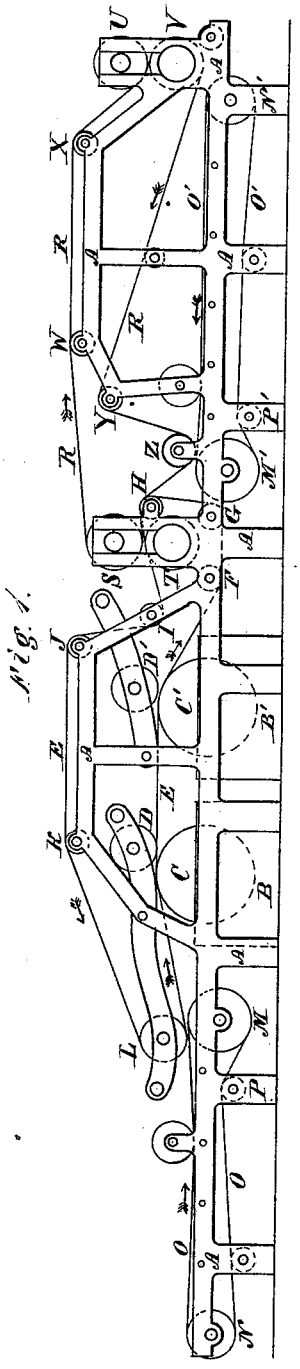

Fig. 1.

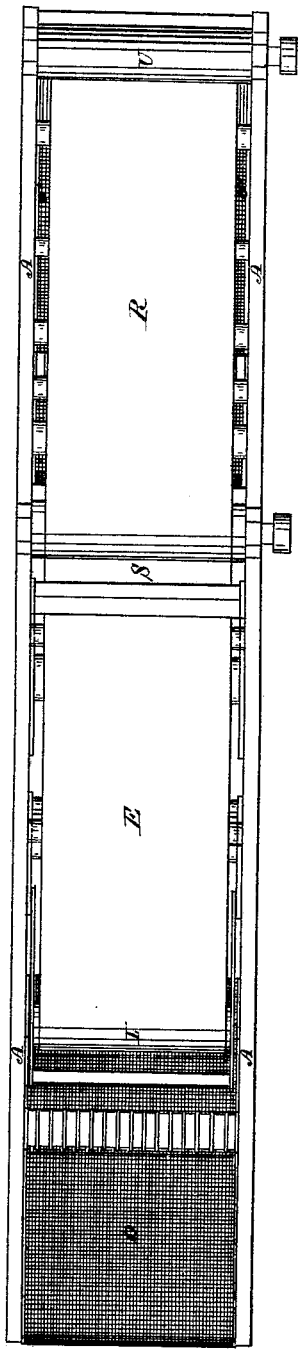

Fig. 2.

Witnesses.
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PHILIP W. HUDSON, OF NORTH MANCHESTER, CONNECTICUT.

IMPROVEMENT IN PAPER-MACHINES.

Specification forming part of Letters Patent No. **195,821**, dated October 2, 1877; application filed April 30, 1877.

To all whom it may concern:

Be it known that I, PHILIP W. HUDSON, of North Manchester, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Paper-Making Machinery; and I do hereby declare that the following is a full, clear, and exact description thereof, whereby a person skilled in the art can make and use the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

Like letters in the figures indicate the same parts.

My improvement relates to machines for the manufacture of paper consisting of more than one layer of different qualities of stock, part of which layers are made upon what is known as the "cylinder-machine," and part upon the "Fourdrinier machine," so called.

The object of my invention is to provide a machine which shall make a paper having a cheap interior material, and which shall be provided with surfaces of the best quality and finish, and also make a paper of different colors upon the two sides and interior, if desired, so as to manufacture an opaque paper, or one that is made of different colors for ornamental purposes.

My invention consists in combining a cylinder-machine, which may be of the ordinary single or double construction, with two Fourdrinier machines, in such a manner that the cylinder-machine shall make the interior of the combined sheet and the Fourdrinier machines shall make the surfaces of the same.

It also consists in the several mechanical combinations and arrangements of devices by which the desired result is produced.

In the accompanying drawing, Figure 1 shows a side view of my improved machine. Fig. 2 shows a top view of the same.

A is the stationary part of the frame, which is constructed in the customary manner. B B′ are the pulp-boxes of the cylinder-machine. C C′ are the making-cylinders, which take up a layer of pulp as they revolve, in the usual manner. D D′ are the couching-rolls, which operate in the usual manner. E is a felt, which passes over the circumference of the making-cylinders and then around the guide-rolls F G H I J K and the larger roll L, the purpose of which will be hereinafter described. The rolls D, D′, and L are hung in frames, which are jointed to the stationary frame A in such a manner that they press downward with a certain degree of pressure upon the felt underneath them. M and N are the principal rollers, which carry the wire apron O of a Fourdrinier machine. This apron is supplied with pulp, and is operated in the usual manner for such machines. I is a tightening-roller for the apron O, which also passes over the customary sustaining-rolls. The roller D rests down upon the wire apron, near the large roller M.

At the other end of my improved machine is another Fourdrinier machine, in which the letters M′ N′ O′ P′ represent the same parts as the corresponding letters at the other end of the machine.

Motion is given to these two Fourdrinier machines in the usual manner, and the aprons are furnished with all the appliances commonly employed.

Above the last-described Fourdrinier machine is the endless felt R, passing between the pressure-rollers S T and U V, and over the rollers W X Y Z H, as shown in Fig. 1.

The operation of my improved machine is as follows: The aprons O O′ of the two Fourdrinier machines and the cylinders C C′ of the cylinder-machines being supplied with pulp of the desired quality and color, and the machine being set in motion by pulleys and belts in the usual manner, a single sheet or layer of paper to form one side of the combined sheet is taken up from the apron O by the roller L and transferred to the surface of the felt E. As this felt passes along the direction of the arrow additional layers of paper, to form the interior of the combined sheet, are placed upon the first Fourdrinier layer by the cylinders C and C′. These layers then pass along upon the felt E, around the guide-rollers F and G, to the roller H, where they meet the second Fourdrinier layer, which is taken off from the apron O′ by means of the roller Z upon the felt R, or it can be couched onto the three layers at guide-roll H in the ordinary manner. This, it will be observed, covers the layers from the cylinder-machine, so that the two Fourdrinier layers form the outside surfaces of the combined sheet. The whole sheet then passes between the pressure-rollers S T and is transferred to the felt R, over which it passes in the

direction of the arrow, and, after passing between the pressure-rollers U V, leaves this machine to be submitted to further operations, in the usual manner, to complete and finish the paper.

What I claim as my invention is—

1. The combination of two Fourdrinier machines for forming the outside surfaces of a sheet of paper with a cylinder-machine for making the interior filling, substantially as herein described.

2. The combination of the couching-roller L and the felt of a cylinder-machine with the wire apron O of a Fourdrinier machine, for transferring the Fourdrinier layer to the cylinder-felt, substantially as herein described.

3. The combination of the apron O, the felt E, the apron O′, and the junction-felt R with suitable rollers arranged so that successive layers shall be taken up in the manner described—that is, so that the layers from the aprons O and O′ shall be outside those from the cylinders C and C′, substantially as herein set forth.

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Witnesses:
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