G. WILSON & A. RAYMOND.
Paper-Machine.

No. 215,422. Patented May 13, 1879.

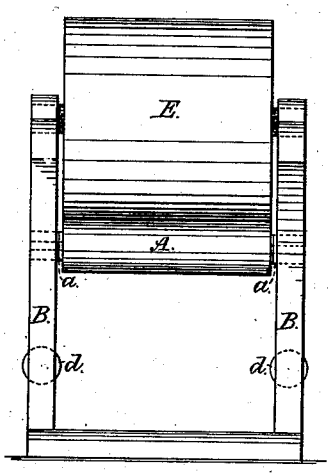

FIG. 1.

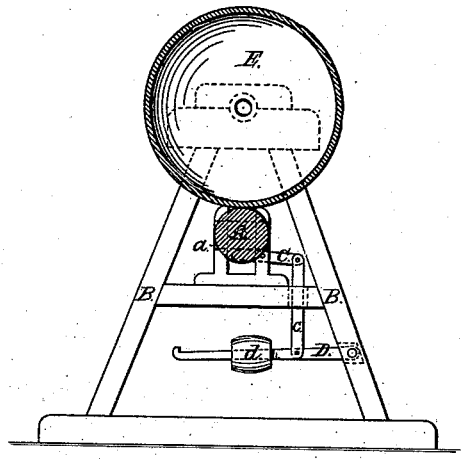

FIG. 2.

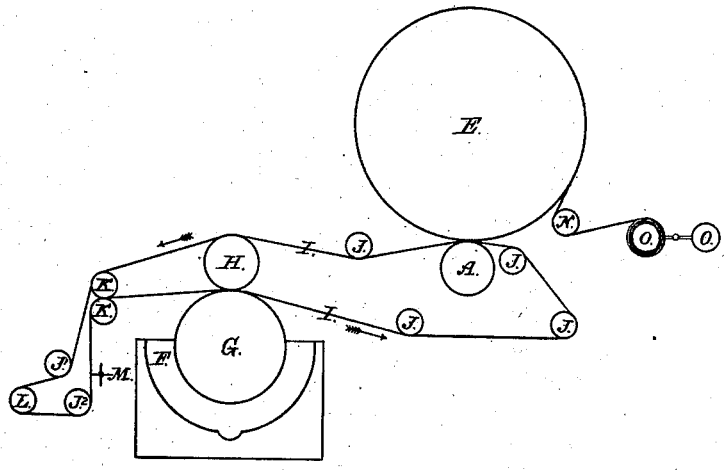

FIG. 3.

Witnesses,
E. F. Benham,
C. J. Mattison.

Inventors,
GEORGE WILSON,
ANDREW RAYMOND,
~by~
William H. Low,
Attorney.

UNITED STATES PATENT OFFICE.

GEORGE WILSON AND ANDREW RAYMOND, OF AMSTERDAM, NEW YORK.

IMPROVEMENT IN PAPER-MACHINES.

Specification forming part of Letters Patent No. **215,422**, dated May 13, 1879; application filed April 9, 1879.

To all whom it may concern:

Be it known that we, GEORGE WILSON and ANDREW RAYMOND, of Amsterdam, in the county of Montgomery and State of New York, have invented certain new and useful Improvements in Paper-Machines, of which the following is a full and exact description.

The object of our invention is to simplify the construction of paper-machines by dispensing with many of the pressing and drying rollers heretofore used, and by utilizing the drying-rollers to perform the double function of pressing and drying, as herein described, whereby a material saving is effected not only in the cost of construction in the machinery, but in the cost in the time and labor in manufacturing the paper.

To attain this end our invention consists in substituting for the many pressing and drying rollers commonly used in paper-machines a single pressing-roller and a single drying-roller arranged in relation to each other, as herein shown and described, the drying-roll being enlarged to obtain sufficient surface to effectually dry the paper while it is passing over the roller.

In the accompanying drawings, which form a part of this specification, and to which reference is herein made, Figure 1 is a front elevation of our arrangement of combined pressing and drying rollers; Fig. 2, a longitudinal section of same; and Fig. 3, a skeleton drawing, showing the general arrangement of our improvement to the other parts of the paper-machine.

As shown in the drawings, A is the bottom press-roll, made in all respects like the ordinary press-rolls of the paper-machine. It runs in the movable bearings *a* in the side frames, B. Said bearings are carried by the levers C, connected by rods *c* to the lever D, to which the adjustable weights *d* are fixed to regulate the pressure required to be imparted by the roller.

E is the upper roller, revolving in fixed bearings in the side frames, B, over the roller A. This roller E is designed to perform the usual function of the upper roller of the press-rolls, and in addition thereto to serve as a drying-roller. For that purpose we make it hollow, so as to heat it by steam in the usual manner; and in order to obtain sufficient drying-surface we increase its diameter to five or six feet, and even larger when necessary, for the purpose of completing the drying of the paper while passing over this single roller.

The rolls A and E are arranged in relation to the other parts of the paper-machine in the manner shown in Fig. 3, in which figure F is the pulp-vat; G, the cylinder-mold; H, the coucher; I, the blanket or felt; J J^1 J^2, guide-rolls for carrying the felt; K, squeeze-rolls for removing the moisture from the felt; L, stretching-roll for tightening the felt; M, the felt-washer; N, guide-roll for the paper; and O, the winders.

As shown in Fig. 3, the felt I runs over the top of the cylinder-mold G, and between it and the coucher H. From thence, as indicated by the arrows, the felt runs forward over the guide-roll J, thence backward between the press-rolls A and E, thence under a guide-roll, J, and over the top of the coucher H, over the upper squeeze-roll K, under the guide-roll J^1, around the stretching-roll L, thence forward under the guide-roll J^2, from whence it passes vertically past the felt-washer M, (where it is subjected to the action of the water discharged by that device,) to and between the squeeze-rolls K, and from thence to the place of beginning, as above described.

The pulp raised by the cylinder-mold G and deposited on the blanket I by passing between the cylinder-mold and coucher has the water partially pressed out of it, and is compressed into sufficient consistency to adhere to the blanket, by which it is carried between the press-rolls A and E, by which the compression of the pulp into paper is completed. The paper, being still damp, has a greater affinity for the heated roll E than for the blanket I, and is taken up by the said roll, and is carried by it until from the great extent of the heating-surface of the roll the paper becomes thoroughly dry. The paper then passes under the paper-roll N, and thence to the winders O, where it is received in proper condition to be taken from the machine.

In addition to the great advantage gained by lessening the cost of construction of the

machine, we also greatly reduce the labor in manufacturing paper, as in our machine the material only requires to be handled by the operator once, while in machines of the ordinary construction the operator is compelled to handle the material from six to eight times from the time the pulp is put into the vat until the paper is removed from the machine.

We claim as our invention—

In a paper-machine, the combination, with a solid press-roll, A, of a hollow roll, E, adapted for heating, as herein described, the said rolls being arranged to co-operate to produce a simultaneous compression and drying of the paper at one operation, as specified.

GEORGE WILSON.
ANDREW RAYMOND.

Witnesses:
MERVIN WEATHERBY,
WILLIAM ASHTON.