

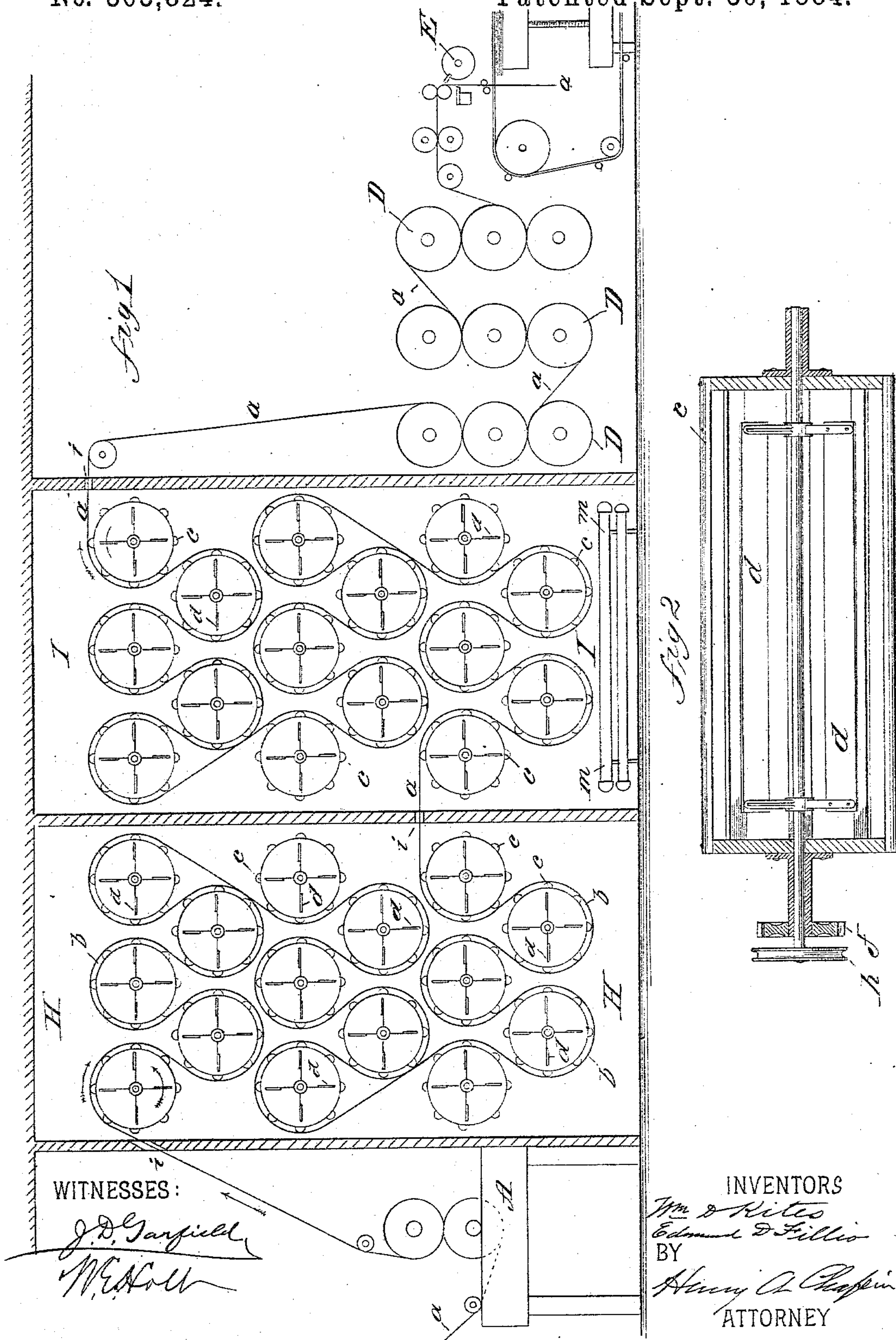
(No Model.)

W. D. KITES & E. D. FILLIO.

APPARATUS FOR AND PROCESS OF TUB SIZING, AIR DRYING, AND  
CALENDERING PAPER IN A CONTINUOUS WEB.

No. 305,824.

Patented Sept. 30, 1884.





# UNITED STATES PATENT OFFICE.

WILLIAM D. KITES, OF RUSSELL, AND EDMUND D. FILLIO, OF DALTON,  
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APPARATUS FOR AND PROCESS OF TUB-SIZING, AIR-DRYING, AND CALENDERING PAPER IN A CONTINUOUS WEB.

SPECIFICATION forming part of Letters Patent No. 305,824, dated September 30, 1884.

Application filed June 20, 1884. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM D. KITES and EDMUND D. FILLIO, citizens of the United States, residing, respectively, at Russell and Dalton, in the counties, respectively, of Hampden and Berkshire, and State of Massachusetts, have invented new and useful Improvements in Apparatus for and Process of Tub-Sizing, Air-Drying, and Calendering Paper in a Continuous Web, of which the following is a specification.

This invention relates to improved means for drying and calendering tub-sized paper in a continuous moving strip as it comes from the machine, the object being to thereby supersede the usual method of producing loft-dried paper, which is practiced by cutting and transporting the sheets to a drying-room, and afterward calendering each of said sheets separately, whereby much time and expense is saved, and less loss results by reason of damage to the paper.

Our process consists, essentially, in taking the strip of paper from a sizing-tub located at the delivery end of a paper-machine to a series of air-drying cylinders, and from thence to a series of calendering-rolls, and from the calendering-rolls to a cutter for dividing the strip into sheets, both of said drying and calendering rolls being adapted to pass the paper in a continuous strip and deliver it to the cutter air-dried and in a condition to be cut. This process, together with the apparatus, is fully illustrated in the accompanying drawings, in which—

Figure 1 is a partial sectional elevation of a machine embodying our invention, and Fig. 2 is an enlarged sectional view of one drier.

A is a size-tub located at the delivery end of a paper-machine. (Not shown.)

b are the drying-cylinders, arranged to receive a strip of paper from the tub A.

D are the calendering-rolls, arranged to take the strip of paper from the drying-cylinders b.

E is a cutter arranged to operate upon the strip of paper as it leaves the calendering-rolls D, and a is a strip of paper delivered from the paper-machine to the cutter E after

passing consecutively over all of the drying-rolls and through the calendering ones.

The drying-rolls b we prefer to form, as shown more particularly in Fig. 2, of open drums of suitable length having longitudinal slats c, and having within them fans d, which we prefer to revolve in the opposite direction to the drums. The drums are connected by gearing f upon one end, and are arranged in series, as shown, to cause their revolution to move the strip a uniformly and continuously. The fans d, in bearings within the trunnions of the drums, are provided with pulleys h outside of the gears f, by means of which a revolution may be given them all together and at a speed or in a direction independent of the drums. The calendering-rolls are of the usual form of construction, and deliver the dried strip of paper a to the cutter E, which is shown arranged over the apron of a paper-piling machine.

H I are two compartments, each of which is shown containing a series of the drying-rolls b, openings i through their walls permitting the passage of the strip a.

In the compartment I, m is a steam-heater, shown arranged upon the floor beneath the driers, and by means of which heater a uniform temperature and hygrometric condition is maintained in the compartment last left by the paper before entering the calendering-rolls, to insure the strip always leaving the drying-rolls in the same condition. By these means we are able to entirely supersede the tedious process of loft-drying heretofore in general use, while obtaining all of the qualities peculiar to air-dried paper.

Now, having described our invention, what we claim is—

1. In combination with a paper-machine having a sizing-tub located at its delivery end, a series of air-drying cylinders, and a series of calendering-rolls, both of said cylinders and rolls being adapted to receive and pass the paper along in a continuous strip from the size-tub to the cutter, substantially as shown and described.

2. In combination with a paper-machine having a sizing-tub located at its delivery end,



a series of air-drying cylinders located in two separate compartments, and a series of calendering-rolls, both of said cylinders and rolls being adapted to receive and pass the paper 5 along in a continuous strip from the size-tub to the cutter, substantially as shown.

3. In combination with a paper-machine having a sizing-tub located at its delivery end, a series of air-drying cylinders located in separate compartments, one of which is adapted 10 to be artificially heated and dried, and a series of calendering-rolls, both of said cylinders and rolls being adapted to receive and pass the strip of paper continuously from the size-tub to the cutter and through said cylinder 15 containing compartments, substantially as set forth.

4. The within-described process of drying and calendering tub-sized paper as it is delivered from the machine in a continuous 20 strip, which consists in passing the paper from the sizing-tub over one or more series of air-drying cylinders, from the latter over a series of calendering-rolls, and from thence to the cutter, whereby the paper is completely air- 25 dried and calendered in the strip and finally divided into suitable sheets.

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