

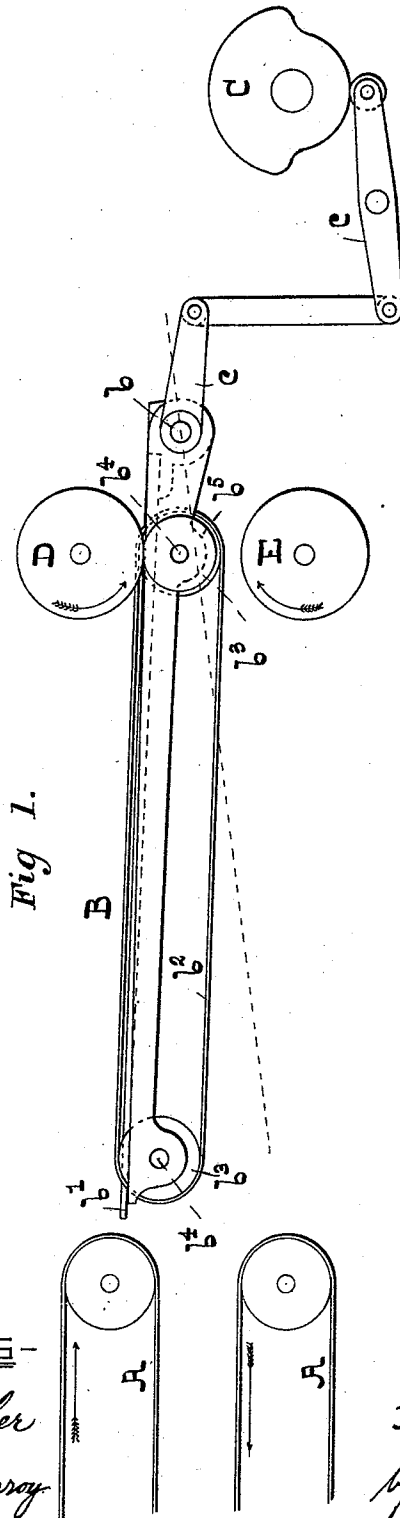
(No Model.)

2 Sheets—Sheet 1.

F. X. HOOPER.  
DRYING APPARATUS.

No. 499,460.

Patented June 13, 1893.



-WITNESSES-

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# UNITED STATES PATENT OFFICE.

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## DRYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 499,460, dated June 13, 1893.

Application filed October 10, 1892. Serial No. 448,288. (No model.)

*To all whom it may concern:*

Be it known that I, FRANCIS X. HOOPER, a citizen of the United States, residing at Baltimore, Maryland, have invented a certain new and useful Improvement in Drying Apparatus, of which the following is a full, clear, and exact description.

This invention relates generally to a drying apparatus used in connection with apparatus for paper coating, and it relates particularly to certain improvements upon Patent No. 363,335, granted to me and William Hollingsworth, May 17, 1887.

The object of my invention is to provide a simple and efficient apparatus, by means of which the paper to be dried can be run off the conveyer belt and automatically shifted to the upper or lower canvas, as may be desired, without bending, folding or turning the paper. This object may be accomplished by means of a vertically vibrating flier frame arranged opposite the ends of each pair of overlying paper conveying belts, said frame carrying a series of transporting tapes, which are adapted to run in one direction as the paper is being run from the belt to the frame and reversed by the vibration of the frame whereby the paper is automatically shifted to the next lower or upper conveyer belt, but I do not limit myself to this method of shifting the paper, as there are many other ways of accomplishing this object.

My invention consists also in certain details of construction and combination of parts whereby the operations of the principal parts are facilitated in their various functions, all of which will be fully explained hereinafter and designated in the appended claims.

In the drawings forming a part of this specification and in which the same letters of reference indicate the same parts:—Figure 1 is a side view of overlying conveyer belts and the vibrating flier frame arranged opposite the ends of the same, the operation of the frame being indicated by a dotted line. Fig. 2 is a top plan view of the top belt and flier frame.

In the practical embodiment of my invention I employ a series of overlying conveyer belts A, adapted to carry the paper to be dried. In order to transfer the paper from an upper belt A, to the next lower one, or from lower to

upper as the case may be without folding, bending or turning the paper, I provide a flier frame B, which is mounted upon a shaft *b*, arranged opposite the ends of the belt and a short distance forward of the same. The flier frame is adapted to vibrate vertically upon the shaft *b*, and to thus operate the frame, I employ a cam C, or other intermittent power device and use any suitable form of lever connections *c* between the power device and forward end of flier frame. The rear end of the flier frame swings adjacent to the forward ends of the belts whereby the paper can be easily run on and off the belt as shown.

The flier frame consists of a series of fly-sticks *b'* and a series of transporting tapes *b<sup>2</sup>* said tapes passing around rollers *b<sup>3</sup>* mounted upon the transverse shafts *b<sup>4</sup>*, the forward shaft *b<sup>4</sup>* being extended laterally beyond the sides of the frame and carrying the friction rolls *b<sup>5</sup>* upon its outer ends.

D indicates a friction wheel arranged above the flier frame, and E a similar wheel below the same which wheels derive their power from any suitable source. I do not confine myself to any one particular mechanical arrangement, however, to produce this result. The wheels shown, however, are revolved in opposite directions as indicated by the arrows in Fig. 1, and when the frame is elevated so as to receive a sheet from the upper belt, the wheel D will contact with the friction roll *b<sup>5</sup>* and drive the tapes *b<sup>2</sup>* in a forward direction which runs off the belt on to the frame B. By this time the cam has operated to vibrate the frame, throwing the same downward. The wheel D is now thrown out of engagement with the roller *b<sup>5</sup>* but the wheel E is immediately thrown into contact with this roll and as the wheel E revolves in a reverse direction the tapes *b<sup>2</sup>* will be moved in a rearward direction thus shifting the sheet from the flier frame to the next lower belt without bending or lining the paper.

It is to be understood that I do not wish to limit myself to the precise form of power transmitters shown in Fig. 1, but may employ other mechanical contrivances to reverse the direction of the tape as the flier frame is vibrated.

It will be observed that the flier frame when elevated is somewhat below the upper range

of upper belt in order to facilitate the removal of the sheet from said belt and when the frame is lowered it rests a short distance above the lower belt so that the paper will run easily  
5 from the frame.

Having thus described the construction, operation, and advantages of my invention, what I claim, and desire to secure by Letters Patent, is—

10 1. An improved apparatus for drying paper consisting of a series of overlying carrier belts and a vertically vibrating flier frame, arranged opposite the ends of each pair of  
15 belts, said flier frame carrying a series of transporting tapes the motions of which are adapted to be reversed as the flier frame vibrates, substantially as and for the purposes described.

20 2. An improved drying apparatus consisting of a series of overlying belts, a vertically vibrating flier frame arranged opposite the ends of each pair of belts the reversible transporting tapes carried by said frame and the power transmitters arranged above and below

the flier frame whereby as the frame is vibrated the motion of the tapes will be reversed, substantially as and for the purpose described.

3. In an apparatus of the character described, a vertically vibrating flier-frame composed of a series of fly-sticks and endless transporting tapes, and pulleys located above and below the said tapes and revolving in opposite directions, and adapted to be alternately brought in contact with the tapes by the vibration of the flier frame to reverse their  
35 motion, substantially as described.

4. In a drying apparatus, the combination with the overlying belts of the vertically vibrating flier frame, composed of fly-sticks and reversible transporting tapes, the friction rolls, the friction wheels, arranged above and below the friction rolls, and the intermediate power device for vibrating the frame, substantially as shown and described.

FRANCIS X. HOOPER.

Witnesses:

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FRANCIS H. ABBES.