

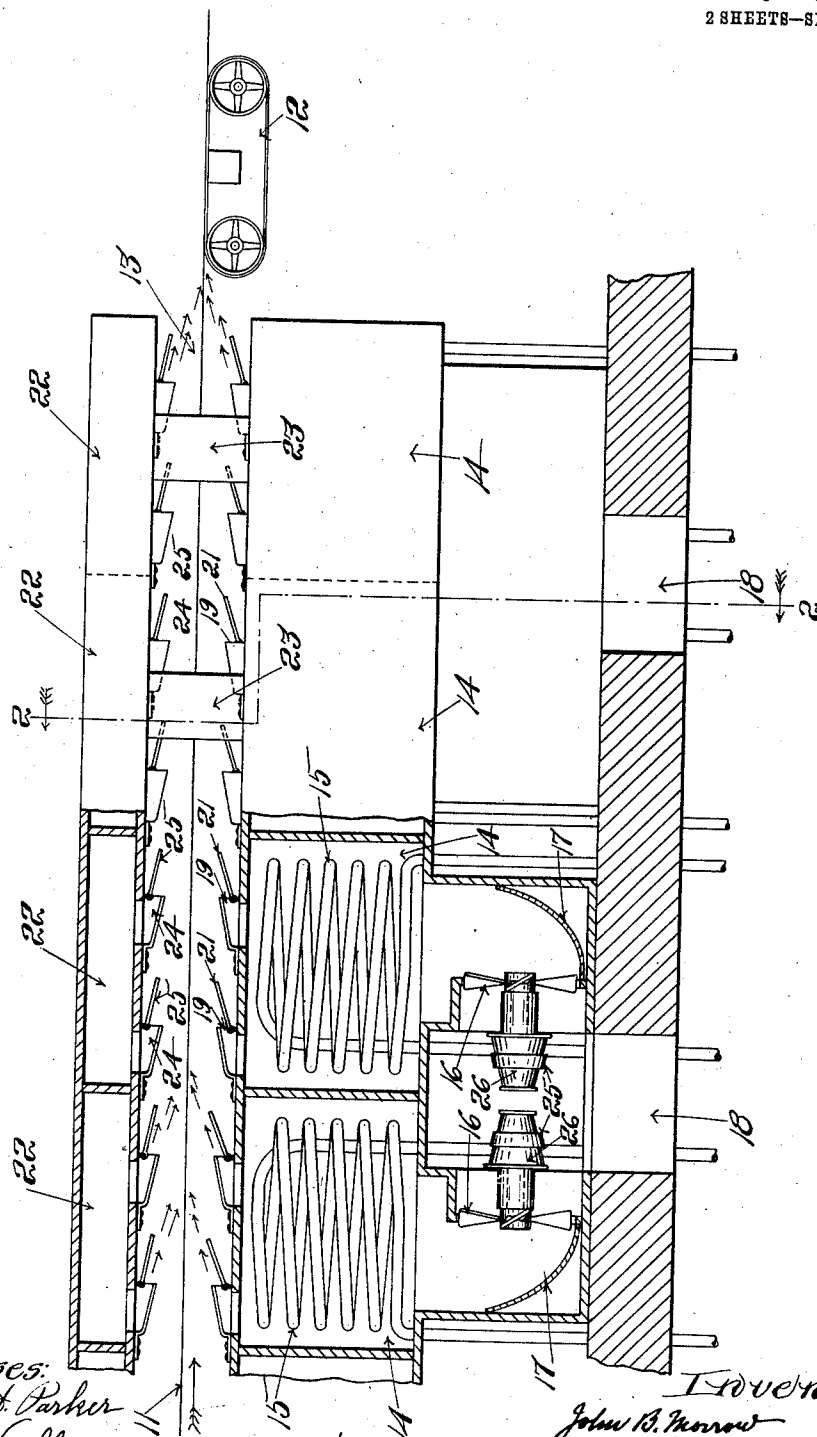
J. B. MORROW.
PAPER COATING MACHINE.
APPLICATION FILED MAY 26, 1908.

927,995.

Patented July 13, 1909.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
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R. Wallace.

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2 SHEETS—SHEET 2.

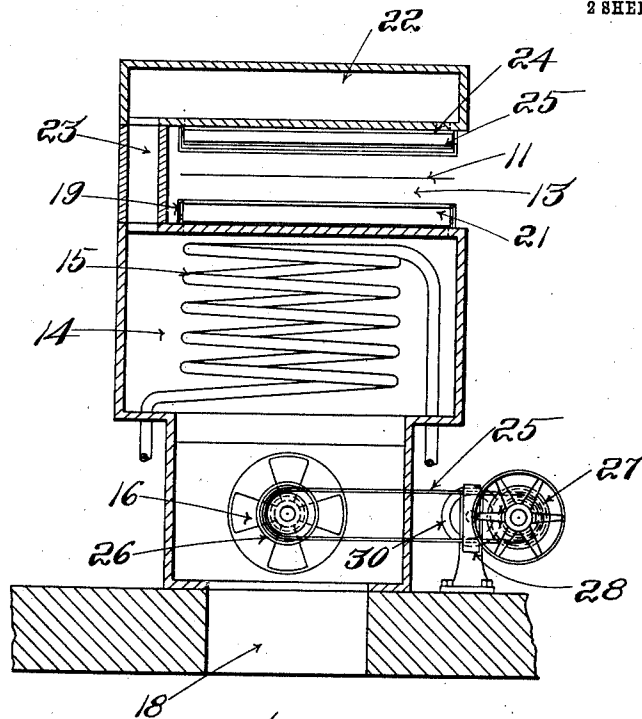


Fig. 2.

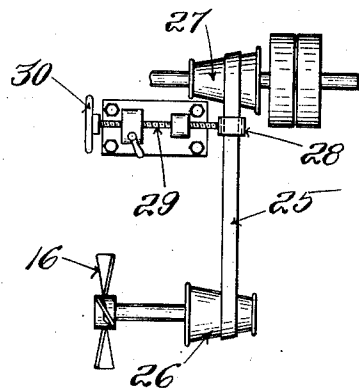


Fig. 3.

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UNITED STATES PATENT OFFICE.

JOHN B. MORROW, OF PEPPERELL, MASSACHUSETTS, ASSIGNOR TO PEPPERELL CARD & PAPER COMPANY, OF PEPPERELL, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

PAPER-COATING MACHINE.

No. 927,995.

Specification of Letters Patent.

Patented July 13, 1909.

Application filed May 26, 1908. Serial No. 435,096.

To all whom it may concern:

Be it known that I, JOHN B. MORROW, a citizen of the United States, residing at Pepperell, in the county of Middlesex, State of Massachusetts, have invented a certain new and useful Improvement in Paper-Coating Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention has to do with that part of a paper coating machine by means of which the paper, after having been coated, is given its preliminary drying before it is looped on the sticks of the festooning machine by means of which it is carried through the heated chamber in which it is finally dried. This process is sometimes called "floating" the paper. When the paper comes through the coating machine, the coating which has just been applied to the paper is in such a condition that if it touches any object, a streak is left on the paper which renders the paper imperfect and consequently a portion of it unsalable. In certain paper coating machines both sides of the paper are coated simultaneously and, therefore, it cannot be supported by any tangible object until the coating has dried sufficiently so that it will not be injured by coming in contact with tangible objects. This result has been accomplished by leading the paper through a chamber and supporting it in the chamber by blowing currents of air against its under side. It has also been customary to blow air upon the upper side of the paper and to regulate the position of the paper in the chamber by means of the intensity of the currents of air which strike the paper above and below. It will be understood, of course, that this air is heated to the proper degree, so that the coating on the paper is dried by the time that the paper leaves the chamber even though the web of paper runs at a high rate of speed. In driers of this kind, it has heretofore been customary to supply the air to the drier by means of a pipe running the length of the drier and through which the air is forced by means of a single fan driven at a high rate of speed. Very considerable difficulty has been experienced with machines of this class because of the fact that the air pressure at the various outlets varies so considerably that at one point the paper may be carried against the ceiling of the chamber while at another point it will not

be properly supported and may sag against the bottom of the chamber, an imperfection resulting wherever the paper comes in contact with the walls of the chamber. It is also found with this construction that the paper frequently flutters so violently as to cause it to strike the walls of the chamber or even to break. This fluttering is much more serious with thin light paper than with heavy paper and has made it impossible heretofore to coat on both sides simultaneously paper of less than a certain weight. It has also been found that a machine which will float the paper properly for one weight of paper will not operate successfully upon a different weight of paper.

My present invention has for its object to produce a drier which shall float the paper more steadily and which shall make it possible to float different weights of paper successfully as well as to float a lighter weight of paper than has heretofore been possible in machines of this class as previously constructed. My experience with this machine has shown that paper which is five pounds per ream lighter may be successfully dried in this machine.

The invention will be fully understood from the following description taken in connection with the accompanying drawings, and the novel features are pointed out and clearly defined in the claims at the close of the specification.

In the drawings,—Figure 1 is a longitudinal view partly in elevation and partly in section of a drier embodying my invention. Fig. 2 is a section on line 2—2 Fig. 1 looking in the direction of the arrows. Fig. 3 is a detail of the mechanism by means of which the speed of the fans is regulated.

Referring now to the drawings and more particularly to Fig. 1,—there is shown at 11 the sheet of paper passing through the chamber of the drying machine in the direction indicated by the arrow. The sheet of paper comes directly from the coating machine (not shown) and passes from the drier to a suction apron 12 or other suitable mechanism by means of which it is delivered to the festooning machine, also not shown. The chamber 13, through which the paper passes unsupported except by the air blast, may be of any requisite length necessary to dry the coating on the paper sufficiently so that it will not be injured by contact with a

tangible object, such for instance as the suction apron or the traveling rods of the festooning machine. The space beneath the chamber 13 is divided into a plurality of compartments 14, each of which is provided with steam pipes 15 or other convenient means for heating the air which is supplied to the drying chamber 13. The steam pipes may be independent for each chamber or may all be part of one system as desired. Beneath each of these compartments and in a passage of proper shape is located a fan 16 which draws air through the opening 18 in the floor and forces the same through the compartment 14 to the chamber of the drier. A deflector 17 is placed in front of the fan to direct the current of air into the compartment 14. The highly heated air escapes from the compartment 14 through the openings or orifices 19 located beneath the paper 11 and is directed in the general direction of the line of movement of the paper by the shape of the orifice 19 through which it escapes and by means of a deflector 21. Above the sheet of paper is located another series of compartments 22 corresponding with the compartments 14 below the paper, and each supplied with air from its corresponding lower compartment through an air duct 23 on the side of the sheet. The lower floor of the upper compartments is provided with air orifices 24 and deflectors 25 similar to the orifices 19 and deflectors 21 below the paper. By changing the position of the deflectors slightly, the position of the paper as it floats through the chamber may be somewhat regulated. If, for instance, the paper sags too much, the lower deflectors are turned upward at that point to project the air against the paper more directly. The fans are driven at a variable speed by means of a belt 25 on the cone pulleys 26 and 27, the speed of the fans being determined by the position of the belt on the said cone pulleys. I find it convenient to provide a belt shipper 28 mounted on a screw 29 and operated by a hand wheel 30 by turning which the fans may be caused to rotate faster or slower as

the case may be. In this way the speed of each pair of fans may be regulated, and the pressure of the air in the corresponding compartments increased or diminished.

By using a series of independently driven fans the speed of which may be varied at the will of the operator, it is possible to regulate the air pressure at each point in the drying chamber and consequently it is possible to float the paper with great accuracy, it being necessary only to regulate the air pressure slightly to accomplish the desired change in the position of the paper. In this way a very long drying chamber may be used with equal floating effect throughout. I also find that the tendency of the paper to flutter can be very largely overcome. As the fluttering of the paper tends to break the paper and to produce imperfections in the coating, this is of the highest importance.

I claim as my invention:

1. In a drier for a paper coating machine and in combination with a drying chamber through which the sheet of paper passes to be dried, a plurality of compartments connecting with the said drying chamber by openings, a fan for each compartment, and means for giving to each fan a speed which is independent of the speed of the other fans.

2. In a drier for a paper coating machine, the combination of a drying chamber through which the sheet of paper passes to be dried, a plurality of compartments in pairs one above and one below said chamber and connecting with said chamber by orifices, a duct connecting said compartments in pairs, heating means for one compartment of each pair, a fan for each pair of compartments and independent actuating means for each of the fans.

In testimony whereof I affix my signature, in presence of two witnesses.

JOHN B. MORROW.

Witnesses:

GEORGE P. DIKE,
ALICE H. MORRISON.