No. 765,507. PATENTED JULY 19, 1904.

L. W. NOYES.

MACHINE FOR COATING PAPER OR LIKE MATERIALS.

APPLICATION FILED DEC. 14, 1903.

NO MODEL.

Fig. 1.

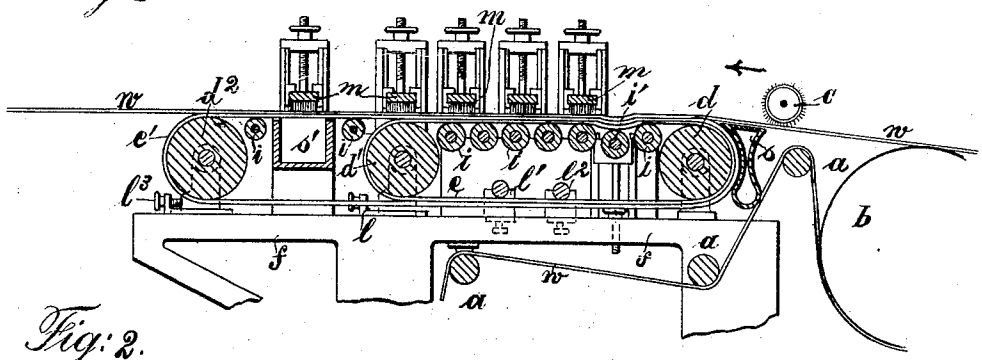


Fig. 2.

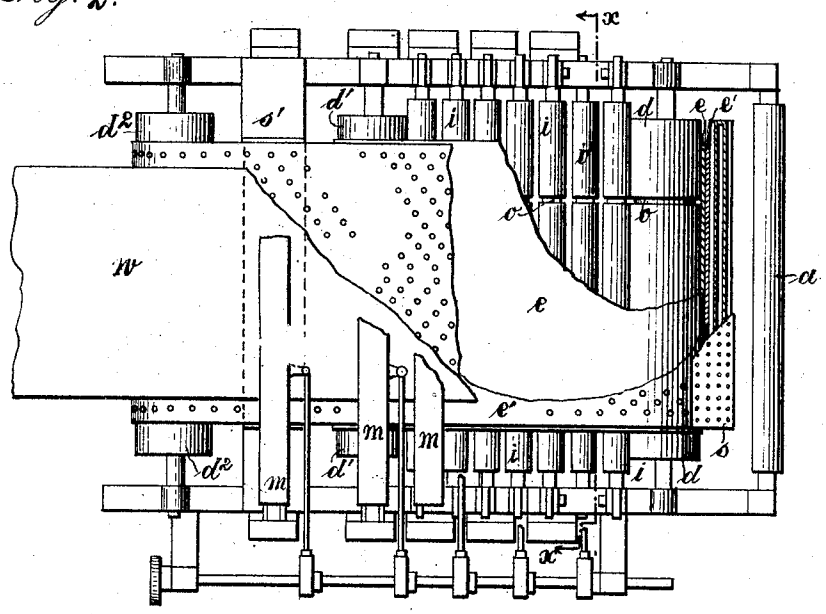


Fig. 3.

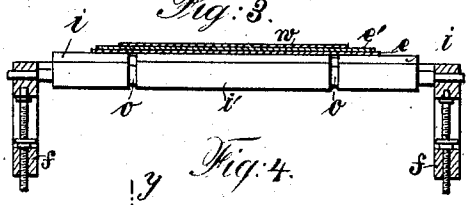


Fig. 4.

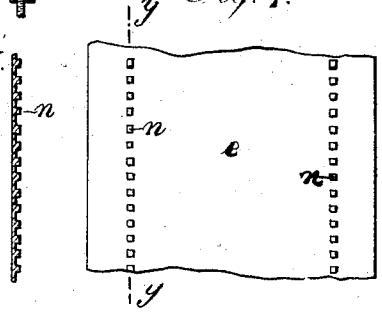


Fig. 5.

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No. 765,507. Patented July 19, 1904.

UNITED STATES PATENT OFFICE.

LEWIS W. NOYES, OF MECHANICSVILLE, NEW YORK.

MACHINE FOR COATING PAPER OR LIKE MATERIALS.

SPECIFICATION forming part of Letters Patent No. 765,507, dated July 19, 1904.

Application filed December 14, 1903. Serial No. 185,012. (No model.)

To all whom it may concern:

Be it known that I, LEWIS W. NOYES, a citizen of the United States of America, and a resident of Mechanicsville, in the county of Saratoga, State of New York, have invented certain new and useful Improvements in Machines for Coating Paper or Like Materials, of which the following is a specification.

This invention has reference to improvements in machines for coating paper or like materials, and relates particularly to a conveyer of novel construction.

It is the special object of this invention to provide a paper-conveyer by means of which a more perfect paper is obtained and a larger quantity run through the machine. Heretofore only from one hundred and fifty to one hundred and seventy-five feet of paper could be run through a machine per minute under most favorable circumstances, while under same conditions I am enabled to run over three hundred feet of paper through the machine per minute and still get a better product. To attain this desirable result, I have provided devices which during the operation of the machine keep the paper perfectly flat and prevent the web from curling on the edges or from cockling.

My conveyer comprises, essentially, a double or compound apron, which consists of an endless short apron of continuous material running over a novel bed of rolls and a perforated long apron, which for a certain length runs over the short apron. There are also guiding devices for the short apron, provided for the purpose of attaining the high speed of the web of paper and preventing the web from moving sidewise.

The invention further consists in the details of construction and the novel arrangement of suction devices and other parts. It is illustrated in the accompanying drawings, in which—

Figure 1 represents in side elevation, partly in section, a conveyer which embodies my invention. Fig. 2 illustrates same in top plan view, partly broken away. Fig. 3 is a cross-section of a detail on line $x\ x$ of Fig. 2. Fig. 4 shows a portion of the short apron with guiding-lugs, and Fig. 5 is a cross-section on line $y\ y$ of Fig. 4.

Similar characters of reference denote like parts in all the figures.

The apparatus is adapted for use in manufacturing paper which is coated on one side only. The web w of the paper or other fabric after leaving the reel and passing over a number of the usual guiding-rolls a and through the coating devices will reach the drum b, which is partly shown in Fig. 1. From here the web enters the conveyer and passes through same onto the drying apparatus. Next to the drum b there is a dancing brush c, which acts on the top or coated surface of the web. A suction-box s is permanently secured below. It extends across the whole width of the machine and draws the web tightly down upon its top surface. This suction-box has a relatively large and perforated top surface and curved-in side walls, as shown in Figs. 1 and 2. The inner curved side wall corresponds to the circumference of an adjoining roll d. A similar roll d' is provided at a certain distance, and a third roll d^2 of like construction is somewhat farther away. These three rolls are substantially mounted on a suitable framework f and carry the endless aprons. The short apron e of continuous material is preferably made of rubber and passes over the rolls $d\ d'$. The long apron e' may be made of perforated rubber or wire and passes over the rolls $d\ d^2$ and at the same time over the short apron e.

Between the rolls $d\ d'$ there are a number of small rolls i, which form a bed for the short apron e. These bed-rolls i are mounted within a suitable box and answer the same purposes as the old-fashioned bridge. The rolls i are all adjustable and may be raised or lowered on either side by any suitable means. As shown in Fig. 1, the short apron e passes around the rolls $d\ d'$ and over the rolls i, which latter form a substantial bed for the short apron, and consequently for the long apron and the web, when the brushes m, mounted above, act on the web. For the purpose of stretching the short apron a device l is provided near the roll d'. (See Fig. 1.) This

device is of usual construction and works by means of a screw. Two auxiliary stretching devices or set-ups l' l^2 are secured upon the framework f. They reach beyond the aprons and are adapted to assist in stretching same. Another stretching device l^3 is near the roll d^2.

One of the bed-rolls, located beneath the short apron, is mounted in adjustable bearings somewhat below the others. Fig. 3 shows this roll i' in detail with its adjusting devices, together with the two aprons and the web, in section. The roll i' may be raised or lowered on either side for the purpose of adjusting slack edges. By means of this arrangement the web sags, whereby any occurring slack edges are adjusted. If, for instance, a slack edge is on the right side of the web, then the roll i' is somewhat lowered on the right side; but when a slack edge occurs on the left side then the left side of the roll will be somewhat lowered.

In order to prevent any side play of the aprons, and consequently of the web moving over same, there is a guiding device provided, partly on the lower surface of the short apron and partly on the various rolls over which said apron runs. The short apron has two rows of lugs n on its lower or inner surface. These lugs are shown in Fig. 4 and in section in Fig. 5. The rolls d d' and the bed-rolls i, as well as the lowered bed-roll i', have each two circular grooves o. The lugs n on the short apron are so arranged that they travel in these grooves o, whereby a uniform and steady movement of the short apron is assured, and consequently any side play of this apron is prevented. As the long perforated apron travels over the short apron and the web over the long apron, there is consequently no side play of the web. This guiding device aids in rendering the machine capable of high speed. One row of the grooves is shown in Fig. 2 in which the short apron is partly broken away. In Fig. 3 the two grooves of the lowered bed-roll i' are both shown.

For the purpose of keeping the web entirely flat a supplemental suction-box s' is provided between the rolls d' and d^2. The suction-box s' also extends across the whole width of the machine. By drawing air out of the box s' the web of paper will be sucked down on the top surface of same, and thereby on the long apron. This facilitates the work of the brushes m, one of which is located directly above the suction-box s', while the others are above the short apron. Any desirable number of such brushes may be employed. In the drawings five of these brushes are shown. They extend across the whole width of the machine and are adjustable, so that they may be raised or lowered, and are thereby brought into the proper position for acting effectively on the coated surface of the paper.

In the described manner and by means of my improved conveyer the web of paper or fabric travels over the aprons in a quick and reliable manner, producing at the same time a better quality of paper.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a machine for coating paper and like materials, a conveyer comprising essentially a double or compound apron composed of a short endless apron of continuous material, a long, endless and perforated apron running over said short apron and means around which both aprons travel.

2. In a paper-coating machine, a conveyer comprising a double or compound apron composed of a short apron of continuous material, two rolls around which said short apron travels, a long, endless and perforated apron, and a third roll in one plane with the two other rolls so arranged that the long apron travels over said third roll and over the short apron.

3. In a paper-coating machine, a conveyer comprising a double or compound apron composed of a short apron of continuous material, two large rolls around which said apron travels, a number of smaller rolls mounted between said large rolls and forming a bed for the inner top surface of the short apron, a long, endless and perforated apron, and a third large roll in one plane with the two other large rolls so arranged that the long apron travels over said third roll and over the short apron.

4. In a paper-coating machine, a conveyer comprising a short apron of continuous material, lugs on its inner surface, two large rolls around which said short apron travels, circular grooves in the rolls corresponding with the lugs on said apron, a third roll in one plane with the two others, and a long, perforated apron traveling over said third roll and over the short apron.

5. In a paper-coating machine, a conveyer comprising a compound apron composed of a short apron of continuous material, two rows of lugs on its inner surface, two large rolls over which said short apron travels, a number of small rolls mounted between the large rolls and forming a bed for the inner top surface of the short apron, two annular grooves in all the rolls corresponding with the two rows of lugs on this apron, a third roll in one plane with the two others, and a long, perforated apron traveling over said third roll and over the short apron.

6. In a paper-coating machine, a conveyer comprising a compound apron composed of a short apron of continuous material, two rows of lugs on its inner surface, two large rolls over which said short apron travels, a number of small bed-rolls mounted between the two large rolls, two grooves in all the rolls corresponding with the two rows of lugs on this apron, a third roll in line with the two others, and a long, perforated apron travel-

ing over said third roll and over the short apron, and a suction-box with perforated top surface in front of the compound apron and extending across the entire width of the machine.

7. In a paper-coating machine, a conveyer comprising a compound apron composed of a short apron of continuous material, two rows of lugs on its inner surface, two large rolls over which said short apron travels, a number of small bed-rolls mounted between the two large rolls, two grooves in all the rolls corresponding with the two rows of lugs on this apron, a third large roll in line with the two others, a long perforated apron traveling over said third roll and over the short apron, a suction-box with perforated top surface in front of the compound apron, and a supplemental suction-box located between the middle and the third large roll and below the perforated apron.

8. In a paper-coating machine, a conveyer comprising a compound apron composed of a short apron of continuous material, two rows of lugs on its inner surface, two large rolls over which said short apron travels, a number of small bed-rolls mounted between the two large rolls, two grooves in all the rolls corresponding with the two rows of lugs on this apron, a third roll in line with the two others, a long perforated apron traveling over said third roll and over the short apron, a suction-box with perforated top surface in front of the compound apron, a dancing brush above said suction-box, and a supplemental suction-box located between the middle and the third large roll and below the perforated apron.

9. In a paper-coating machine, a conveyer comprising a compound apron composed of a short apron of continuous material, two rows of lugs on its inner surface, two large rolls around which said short apron travels, a number of small bed-rolls mounted between the large rolls, a small bed-roll i' adjustably mounted somewhat below the others so that the aprons and the web sag right above same, two annular grooves in all the rolls corresponding with the lugs on the short apron, a third large roll in line with the two others, and a long perforated apron traveling over said third roll and over the short apron.

10. In a paper-coating machine, a conveyer comprising a compound apron composed of a short apron of continuous material, two rows of lugs on its inner surface, two large rolls around which said short apron travels, a number of small bed-rolls mounted between the large rolls, a small bed-roll i' adjustably mounted somewhat below the others, so that the aprons and the web sag right above same, two annular grooves in all the rolls corresponding with the lugs on the short apron, a third large roll in line with the two others, a long perforated apron traveling over said third roll and over the short apron, a suction-box with perforated top surface in front of the compound apron and extending across the whole width of the machine, a dancing brush above said suction-box, a supplemental suction-box located between the middle and the third large roll below the perforated apron, and means for conveying the web of paper or fabric through the conveyer.

11. In a paper-coating machine, a conveyer comprising an apron, two rows of lugs on its inner surface, two large rolls over which said apron travels, a number of small rolls mounted between the large rolls forming a bed for the inner top surface of the short apron, a bed-roll i' adjustably mounted somewhat below the other bed-rolls so that the apron sags above same, two grooves in all the rolls corresponding with the two rows of lugs on the apron, and means for stretching the apron.

Signed at New York, N. Y., this 12th day of December, 1903.

LEWIS W. NOYES.

Witnesses:
DANL. A. SLATTERY,
JOHN F. PAULIS.