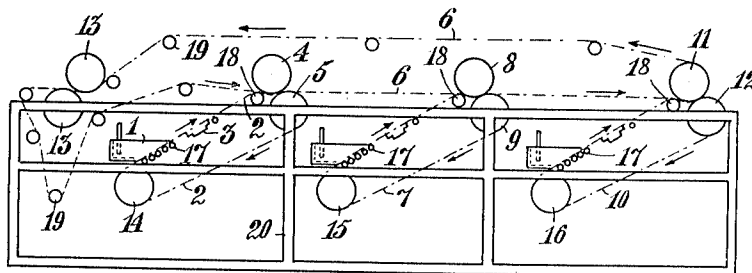


O. F. HAKANSSON.
METHOD OF AND MACHINE FOR MANUFACTURING PAPER.
APPLICATION FILED JAN. 16, 1909.

1,001,521.

Patented Aug. 22, 1911.



Witnesses

Aug. 1911
Fred. Nordström

Inventor

Oscar Ferdinand Håkansson

UNITED STATES PATENT OFFICE.

OSCAR FERDINAND HÅKANSSON, OF NYQVARN, SWEDEN.

METHOD OF AND MACHINE FOR MANUFACTURING PAPER.

1,001,521.

Specification of Letters Patent.

Patented Aug. 22, 1911.

Application filed January 16, 1909. Serial No. 472,764.

To all whom it may concern:

Be it known that I, OSCAR FERDINAND HÅKANSSON, a subject of the King of Sweden, residing at Nyqvarn, in the Kingdom of Sweden, have invented new and useful Improvements in Methods of and Machines for Manufacturing Paper, of which the following is a specification, reference being had to the drawing accompanying and forming a part hereof.

This invention relates to improvements in methods of and machines for manufacturing paper.

In paper-making machines it has been usual to place beneath the pulp-vat supplying pulp to the apron one or more suction-boxes in order to cause the fibers to adhere to the said apron. This arrangement entails the drawback that the finer fibers are sucked through the apron and lost, unless the waste water is afterward treated for recovering the fibers.

The object of the invention is to cause the fibers to remain in the position which they take up, when they arrive at the apron, without any fibers being sucked through the same.

Further aims will appear in the course of the following description.

The invention consists, chiefly, in allowing the pulp to deposit on the apron exclusively on account of its own weight.

The invention further consists in the arrangement of two or more endless aprons placed one after the other in a slanting position, each of said aprons being adapted to supply a separate web of pulp to a common apron or long felt placed above the former ones in a position to take up the separate webs of pulp and deliver a paper composed of two or more layers of pulp.

The invention further consists in the construction and combination of parts herein-after more particularly described.

In the drawing, I have shown, in side elevation, a machine embodying the invention, said embodiment being especially adapted for manufacturing paper composed of two or three webs of pulp which may be of different texture and color.

Referring to the drawing, the pulp-vat 1 is continually supplied with, for instance white pulp suspended in water so as to be continually kept filled therewith. The pulp within the vat exerts a pressure on the apron 2, which allows the water to run off

through its meshes, so that the pulp deposits thereon in the form of a thin web. The web of pulp is thereupon carried by the apron 2 over a suction-box 3 by means of which the water is sucked off as perfectly as possible. After the web of pulp has passed beyond the suction-box, it enters between the press-rolls 4, 5 where still more water is removed. Each of the said rolls 4, 5 is suitably provided with a layer of felt. When the upper apron or long felt 6 passes together with the paper between the press-rolls, the paper is pressed onto the felt 6 and a sheet of paper which is white at both sides is obtained.

The same process is repeated at the second supply apron 7, with the difference that the pulp has another, for instance brown color. The paper is brought by the apron 7 onto the felt 6, where the two different layers of pulp are brought together and combined by pressing between the press-rolls 8 and 9 into a single web having a white and a brown side, the so-called duplicate paper.

In manufacturing triplicate paper, pulp of still another, for instance red color, is brought by a third apron 10 moving in the framework 20 from a third pulp-vat onto the felt 6 where it is brought together with the duplicate paper, placed onto the brown side thereof, and combined by pressing between the press-rolls 11 and 12 with the duplicate paper into a single web. Thus, the triplicate paper is white at one side, brown at the middle and red at the other side. The paper is brought backward by the felt, passes between a further pair of press-rolls 13, and is thereupon dried.

In manufacturing thin double-webbed paper, the upper press-roll 11 at the third apron 10 is raised so as to allow the felt with the duplicate paper to freely pass. When a single-webbed or single-colored paper is to be produced, the upper press-rolls at two aprons whichever are raised.

The rolls 14, 15 and 16 are arranged as tightening-rolls, said rolls being adjustable by screws in the longitudinal direction of the corresponding apron. The rolls 17 carry the upper parts of the aprons and aid in removing the water therefrom. The rolls 18 serve as guide-rolls. The guide-rolls 19 for the felt also serve to enable same to be tightened and adjusted, as may be desired.

Although I have shown and described a machine having three slanting supply aprons

it is obvious that any number of supply aprons may be employed. If desired, the machine may consist of one slanting supply apron and an upper apron adapted to receive the web of pulp supplied by the former one.

The machine described has several advantages above those hereinbefore set forth. On account of the strong pressure exerted by the press-rolls at each supply apron a very dry paper is obtained, which is favorable in many respects. Thus for instance in producing thin double-webbed paper having a white side and a strongly colored one no penetrating of the color will take place. A machine according to this invention requires less power and less attendance and less room and, therefore, works more economical than those hitherto usual.

On account of the pressure being exerted by the weight of the pulp without the aid of suction, the fibers will remain on the apron in the positions which they take up when they meet the apron without any loss of fibers taking place. Each fiber or bundle of fibers deposited on the apron under the action of the pressure increases the filtering action of the apron so that the water percolating through the apron is almost entirely free from fibers. Thus, long fibers and short ones remain in the paper which is desirable for obtaining a strong and good paper.

By the use of endless supply aprons of the form illustrated the further advantage is gained that the speed of the machine may be considerably raised. When round aprons are used, the speed of the machine cannot be increased above a certain low limit, since the pulp would otherwise be thrown away from the apron by the action of the centrifugal force. When using endless supply aprons of the form shown in the drawing the working is independent of the centrifugal force, and the speed of the machine may, therefore, be increased to about three times that hitherto used.

I claim:

1. In a paper-making machine, the combination of endless aprons placed one after the other, in a slanting position, pulp vats placed above the said aprons, the bottoms of said vats being formed by parts of the aprons having their opposite sides exposed to atmospheric pressure, and a common apron for taking up the separate webs of pulp deposited on the said slanting aprons, one after the other, substantially as and for the purpose set forth.

2. In a paper-making machine, the combination of endless aprons placed one after the other, in a slanting position, pulp vats placed above the said aprons, the bottoms of said vats being formed by parts of the aprons having their opposite sides exposed to atmospheric pressure, means for supporting the said parts of the aprons against the weight of the columns of pulp thereon, and a common apron for taking up the separate webs of pulp deposited on the said slanting aprons, substantially as and for the purpose set forth.

3. In a paper-making machine, the combination of endless aprons placed one after the other, in a slanting position, pulp vats placed above the said aprons, the bottoms of said vats being formed by parts of the aprons having their opposite sides exposed to atmospheric pressure, suction boxes placed under the upper parts of the aprons, beyond the pulp vats, and a common apron for taking up the separate webs of pulp deposited on the said slanting aprons, substantially as and for the purpose set forth.

4. In a paper-making machine, the combination of endless aprons placed one after the other, in a slanting position, pulp vats placed above the said aprons, the bottoms of said vats being formed by parts of the aprons having their opposite sides exposed to atmospheric pressure, means for supporting the said parts of the aprons against the weight of the columns of pulp thereon, suction boxes placed under the upper parts of the aprons, beyond the pulp vats, and a common apron for taking up the separate webs of pulp deposited on the said slanting aprons, substantially as and for the purpose set forth.

5. In a paper-making machine, the combination of endless aprons placed one after the other, in a slanting position, pulp vats placed above the said aprons, the bottoms of said vats being formed by parts of the aprons having their opposite sides exposed to atmospheric pressure, rolls placed immediately beneath the parts of the aprons forming the bottoms of the said vats, and a common apron, placed above the former ones, for taking up one after the other of the webs of pulp deposited on the said slanting aprons, substantially as and for the purpose set forth.

OSCAR FERDINAND HÅKANSSON.

Witnesses:

AUG. SÖRENSEN,
FRED. NORDSJD.