G. SCHENCK, Jr.

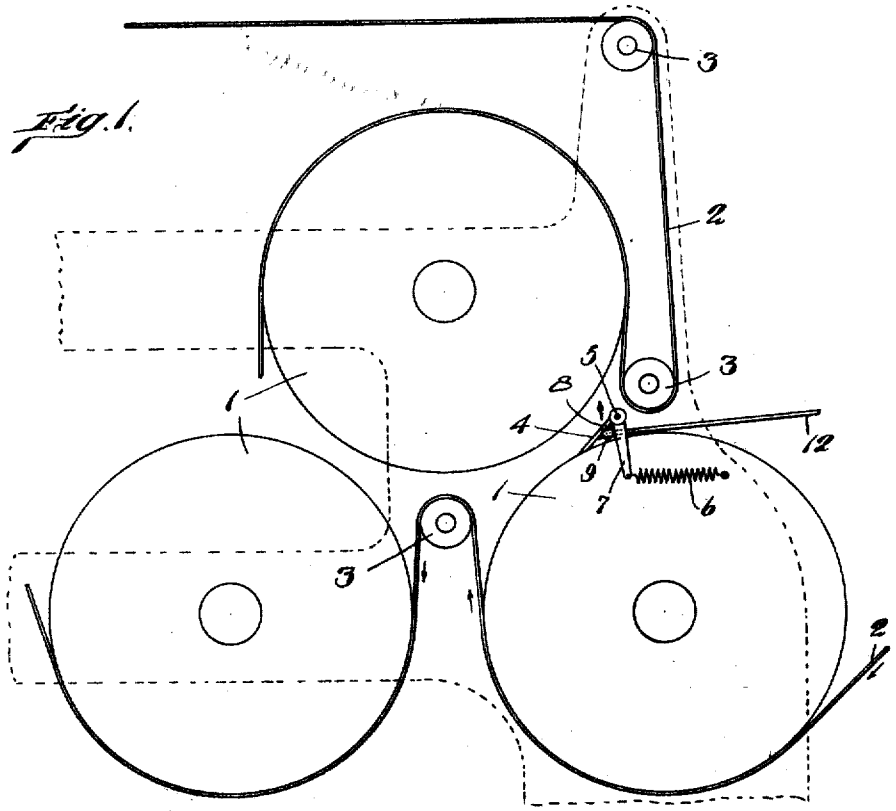
APPARATUS FOR MAKING PAPER.

APPLICATION FILED MAR. 18, 1915.

1,267,701.

Patented May 28, 1918.

Fig. 1.



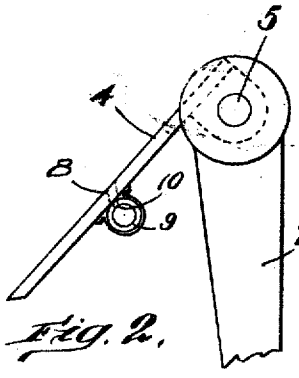


Fig. 2.

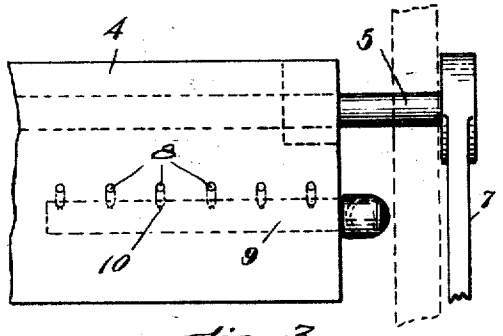


Fig. 3.

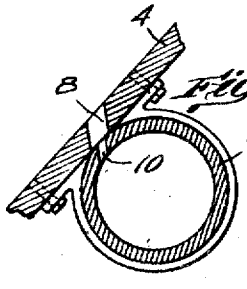


Fig. 4.

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Attys.

UNITED STATES PATENT OFFICE.

GARRET SCHENCK, JR., OF MILLINOCKET, MAINE, ASSIGNOR TO GREAT NORTHERN PAPER COMPANY, OF MILLINOCKET, MAINE, A CORPORATION OF MAINE.

APPARATUS FOR MAKING PAPER.

1,267,701. Specification of Letters Patent. Patented May 28, 1918.

Application filed March 18, 1915. Serial No. 15,361.

To all whom it may concern:

Be it known that I, GARRET SCHENCK, JR., a citizen of the United States, residing at Millinocket, in the county of Penobscot and State of Maine, have invented an Improvement in Apparatus for Making Paper, of which the following is a specification.

This invention relates to an improvement in the drying portions of that type of paper-making machine in which the web is led over a series of rotating cylindrical driers, and to a process for causing the web which has passed from a drying cylinder into contact with a scraper or stripper to leave the stripper and pass to the next cylinder. It can be readily applied to machines of the type shown in Letters Patent to Charles E. Pope, No. 1,113,908, dated October 13, 1914, but is applicable to all machines of the general type above described.

In starting up such a papermaking machine, or in rethreading the web through the driers after a break, the front end of the paper, as it passes around the first drier toward the second drier, is detached from or stripped off the first drier by a scraper or stripper. This stripper is usually hot and the web at this point is moist, and as the course of the web is or may be upward against the force of gravity, the momentum of the web, due to its speed, may not be sufficient to carry it to the second drier, in all cases. If the web does stick to the stripper, it may be difficult, and at very high speeds, may be impossible, to detach it from the stripper and pass it to the second drier by a manual operation, in time to prevent the clogging of the machine. My invention is designed to avoid this difficulty.

I have found that by associating with the stripper, means whereby a blast or blasts of air are properly directed relative thereto, that the web will be deflected in such manner as to prevent it from sticking to the stripper, that is to say, in case the web has such tendency; or if by any reason, the web does stick to the stripper, it will be deflected relative thereto so as to be detached therefrom, and in both instances, the deflected web will be directed toward the next drying cylinder for engagement therewith. For instance, the scraping or stripping blade may be perforated, and streams or jets of air driven through the perforations at a considerable velocity, preferably in a more or less upward direction, or in a direction away from the blade and toward the next cylinder, thereby to deflect the web and prevent it from adhering to the blade or, if adhering thereto, to detach it therefrom, so that the deflected web will easily and surely pass from one drying cylinder to the next, and thus proceed through the machine as intended.

Each stripper, where the web is liable to cause trouble, should have associated with it, means involving this invention, but there is little chance of the difficulty occurring except in the first few drying cylinders of the set, when the machine is started up, or after a break.

My invention is especially applicable to fast running machines, and in such machines I prefer to arrange the driers so that the web is delivered first to a lower drier, passing between the apron and drier, in a well-known way, as by passing over a roller and running down between the apron and the drier. When this arrangement is used, however, the passage from the first drier to the second drier is upward, and as the web is moist and the stripper is hot, the momentum of the web will not always overcome both the force of gravity and the tendency of the web to stick to the stripper, and as the web is, or may be, traveling at the rate of speed of over 700 feet a minute, a stoppage of a second will cause more than ten feet of paper to accumulate in the narrow space between the driers and clog the machine so that it must be cleared before the web can be carried along properly. I have found, however, that by the use of my device this clogging can be absolutely prevented, even at the first drier, and with much greater certainty at each subsequent drier. In practice, however, I have found it unnecessary to use my invention beyond the first few driers, but if, owing to the character of the web, any trouble of the nature which it is the object of this invention to remove, is found to occur, the invention should be applied to every stripper where the difficulty is liable to occur.

In the drawing, wherein a satisfactory embodiment of my invention is shown,

Figure 1 is a side elevation of the stripper applied to one of the driers.

Fig. 2 is an enlarged side-view.

Fig. 3 is a front elevation, and,

Fig. 4 is a transverse vertical section.

1 represents, in conventional form, the drying-cylinders, two tiers of cylinders being here shown, 2 the aprons, and 3 the rolls arranged between the cylinders over which the aprons pass, all of which elements are or may be of any usual or suitable construction and arrangement.

4 is the scraping or stripping-blade which is associated with any one or more of the drying-cylinders of the set, it being disposed substantially tangential with respect to the surface of the cylinder. It is preferably supported by a rod 5, which is pivotally supported preferably in the main frame of the machine and which has associated with it a spring 6, here shown as attached at one end to an arm 7, secured to the rod, and at the other end to the frame, thereby to hold the blade in engagement with the surface of the cylinder in a yielding manner. The blade 4 has numerous perforations 8, arranged in a row, throughout a greater or lesser portion of its length, usually, however, being arranged at one end-portion of the blade. The reason why it is unnecessary to have the entire blade perforated throughout the width of the machine is that in starting up after a break it is usual to pass along a narrow strip only, and I have found that after this strip has been passed along and is running properly, that commonly the full width of the web will go through the machine without difficulty. This is particularly true with driers arranged substantially as shown in the drawing, or in such other way that the strippers coöperate with the aprons and driers in leading the web along. With the aid of my invention, after the web is running at full width through the machine, it is usually unnecessary to continue the use of the air current, but if any difficulty occurs owing to the sticking of the web on the stripper blades, the air current should be applied for so much of the blade as is found necessary and should be kept up as long as is necessary. It will be understood that more than one row of perforations may be employed, if desired, and furthermore, said perforations may be arranged in any other desired manner.

An air-pipe 9 is arranged back of the blade which is substantially coextensive with the length of the row of perforations, and said air-pipe has numerous perforations 10, arranged to register substantially with the perforations of the blade, thus to admit of jets or streams of air which issue from the perforations in the pipe to project through the perforations in the blade. Said air-pipe is connected with an air-supply 12, which is connected with any suitable form or type of air-forcing or compressing-device, so that the jets or blasts of air are caused to project through the perforations in the blade with considerable velocity. The perforations in the blade are preferably of larger diameter than the perforations in the air-pipe, so that the jets or blasts of air which issue therefrom will diverge, and thereby cover a large area, the intent being to have the jets or blasts of air sufficiently numerous, and to cover sufficient area to form substantially a continuous sheet for engaging the web which passes over the blade.

These jets or blasts of air, or it may be a sheet, which is the equivalent thereof, deflects the web in such manner as to prevent it from sticking to the blade, or, in case, for any reason, it should stick to the blade, to detach it therefrom, and in either case, to deflect and direct it toward the next drying-cylinder. In case the next drying-cylinder is in a higher plane, then the perforations in the blade and also in the air-pipe will be arranged in a diagonal direction, tending upward, so as to deflect the web in a corresponding direction. Air-forcing devices will be associated with all those stripping or scraping-blades, which it is found necessary or desirable.

From the foregoing it will be apparent that the invention consists broadly in means for passing a current or currents of air in such a manner as to prevent the web from sticking upon the surface of the scraper-blade, and in this broad aspect is not limited to any special form, arrangement, or number of air passages, provided that the air is so directed as to deflect the web away from the scraper-blade, rather than against it; nor is my invention limited to any special arrangement or relative disposition of the drying-cylinders.

Other gases may be used instead of air and the use of such other gases is included within the term "air" in this specification.

I claim—

1. In a papermaking machine, having rotatable drying cylinders arranged in tiers and endless felts for the respective tiers contacting and moving synchronously with the outer surfaces of the cylinders, the combination with a drying cylinder in one tier and a subsequent drying cylinder in the other tier, of a blade arranged adjacent to the earlier drying cylinder, to cause the moist web to leave the earlier cylinder and direct it toward the subsequent drying cylinder, said blade having air passages, and means arranged to blow air through said passages, force the moist web away from the blade and direct it between the subsequent drying cylinder and its felts so as to be led around the subsequent drying cylinder.

2. In a papermaking machine having drying cylinders arranged in tiers, the combination with a drying cylinder, of a blade associated therewith, arranged to cause the web to leave the cylinder, said blade having

numerous perforations, and an air-pipe arranged back of said blade having corresponding perforations, and air supplying means connected with said pipe, whereby air may be forcibly projected through the perforations of said pipe and blade to deflect the web and direct it to another drying cylinder.

3. In a papermaking machine having a series of drying cylinders arranged in tiers, and felts for the respective tiers, the combination with a drying cylinder of the lower tier, and a drying cylinder of the higher tier, of means associated with the lower drying cylinder and arranged to strip the web therefrom and to direct it to contact with and be led around between the upper felt and the higher drying cylinder, and pneumatic means associated with said stripping-means to project currents of air in a direction to blow the stripped web toward the higher drying cylinder.

4. In a papermaking machine having a series of rotatable drying cylinders arranged in tiers, and guiding means respectively associated with the drying cylinders of each tier, the combination of a drying cylinder of the lower tier, and a drying cylinder of the higher tier, and the guiding-means of both tiers, of a blade associated with the lower drying cylinder and arranged to strip the web therefrom and to direct it into the space between the higher drying cylinder and the guiding-means, said blade having perforations through which a blast of air is forced, thereby to engage the under side of the web and prevent it from adhering to the blade, and also to deflect it in a direction to cause it to enter said space, thus to insure the web being carried around the higher drying cylinder, and means to force the air through the perforations of said blade.

5. In a papermaking machine having a series of rotatable drying cylinders arranged in tiers, and traveling felts arranged to move synchronously in connection with said drying cylinders of the respective tiers and guide the web around the cylinders, the combination with a drying cylinder of the lower tier and a drying cylinder of the higher tier and the traveling felts of both tiers, of stripping means associated with said lower drying cylinder and arranged to cause the web to leave said lower drying cylinder, and means to direct a blast of air against the under side of said web in a direction radially outward from said lower drying cylinder and toward the bight between the higher drying cylinder and the guiding felt so as to prevent the web from adhering to said stripping means and to direct said web toward the higher drying cylinder.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

GARRET SCHENCK, JR.

Witnesses:
WILLIAM MARDEN,
FLORENCE L. ZIEMANN.