

H. GAARA.
MACHINE FOR MANUFACTURING PAPER, BOARDS, AND THE LIKE FROM PULP.
APPLICATION FILED OCT. 14, 1909.

983,700.

Patented Feb. 7, 1911.
2 SHEETS—SHEET 1.

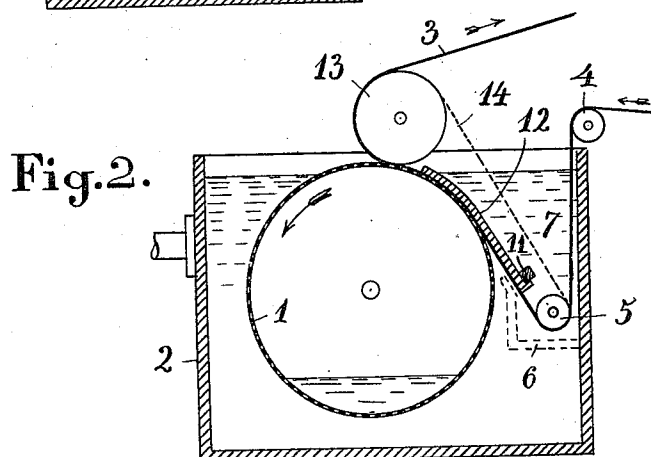
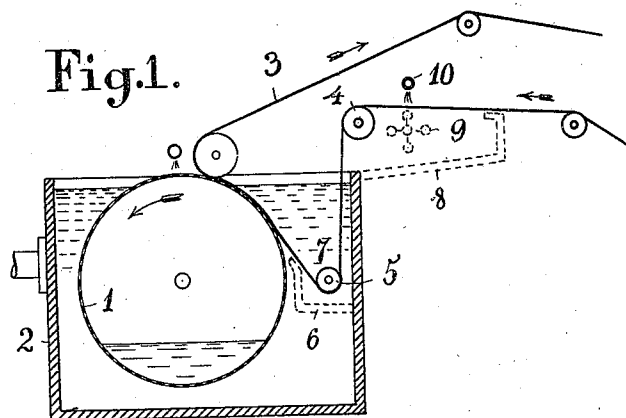
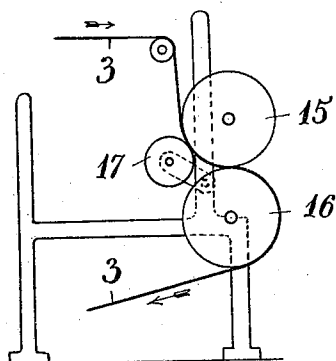


Fig. 3.



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Fig. 4.

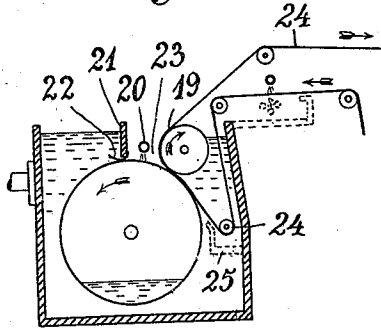


Fig. 7.

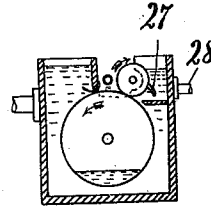


Fig. 5.

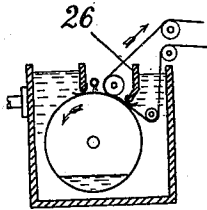


Fig. 8.

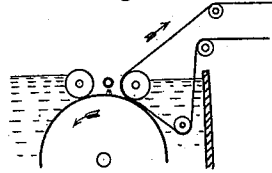


Fig. 9.

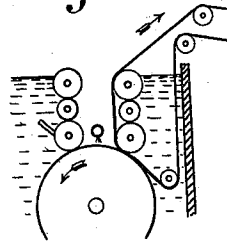


Fig. 6.

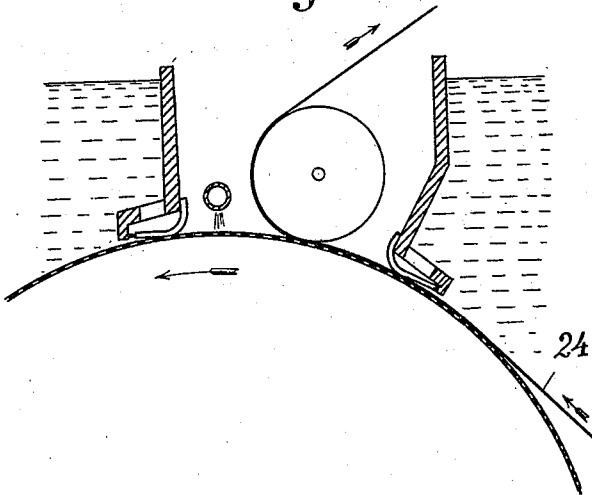
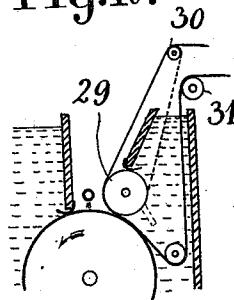


Fig. 10.



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UNITED STATES PATENT OFFICE.

HALVOR GAARA, OF BÖ, NORWAY.

MACHINE FOR MANUFACTURING PAPER, BOARDS, AND THE LIKE FROM PULP.

983,700.

Specification of Letters Patent.

Patented Feb. 7, 1911.

Application filed October 14, 1909. Serial No. 522,563.

To all whom it may concern:

Be it known that I, HALVOR GAARA, a subject of the King of Norway, residing at Bö, Telemarken, Norway, have invented certain new and useful Improvements in Machines for Manufacturing Paper, Boards, and the Like from Pulp; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to machines for manufacturing paper, paper-boards and the like from pulp and has for its object to provide an arrangement whereby the removing of the pulp layer from the strainer cylinder or the cloth covering said cylinder is secured even when the speed of the machine is considerably increased.

As is well known, machines for making paper board must be run at a rather low speed, because the pulp which is deposited on the strainer, is liable to be washed away when the machine is operated at a higher speed, this washing away of the pulp layer taking place at the point where it is lifted out of the water. According to my invention, I overcome this difficulty by passing the press cloth, which removes the layer of pulp from the strainer cloth and conveys it to the press-rollers, on its way back to the straining cylinder and before it reaches the latter down into the water in the tank in which the straining cylinder is mounted to rotate. The press cloth will then press against the strainer cloth, or more exactly, against the pulp layer adhering thereto, while the pulp layer is still below the surface of the water. In this way, the press cloth will press against the pulp layer while it is lifted out of the water, and keep it on the cylinder, thus preventing it from being washed off. The pressure to which the pulp layer is thus subjected also results in making it more compact, so that it will more easily pass below the receiving roller.

My invention is illustrated in the accompanying drawings in which:

Figure 1 is a section through the straining cylinder and tank of a cylinder paper machine, constructed according to my in-

vention. Fig. 2 is a similar view as Fig. 1, showing another machine embodying my invention. Fig. 3 illustrates diagrammatically the arrangement of the pressure rollers carrying the press cloth of the machine, and Figs. 4 to 10 are similar views as Fig. 1, showing other types of cylinder machines embodying my invention.

Referring to Fig. 1, 1 is the straining cylinder, covered in the usual way with strain- ing cloth and adapted to rotate in a vat 2, 3 is the pressure cloth, which removes the pulp layer from the surface of the cylinder and conveys it to the pressure rollers of the paper machine. As shown in the drawings, the pressure cloth passes over a guide roll 4 down into the water in the vat 2 and then over a guide roller 5, mounted below the surface of the water and so arranged as to press the cloth 3 against the pulp layer on the cylinder, while the layer is still below the surface of the water in the vat. If the cloth 3, which, as shown in Fig. 1, is passed down into the pulp water in the vat 2, is liable to be obstructed by the pulp water, the vat 2 may be divided along the broken lines 6, in which case the cloth will run in a separate chamber 7, which may be supplied with pure water. A sufficient amount of water should run into chamber 7 to produce a flow of water from the chamber 7 through apertures in the wall 6 or over this latter to the other parts of the vat and to prevent a flow of water in the opposite direction, when any leakage takes place. The broken lines 8 illustrate an apron, which may be arranged below the cloth 3 outside the apparatus for washing the cloth. The washing device comprises a beater 9 and a spray pipe 10. The object of the apron is to conduct the water dripping from the cloth back into the chamber, 7. The water supplied in this manner can be considered pure in comparison with the pulp water in the vat 2.

As shown in Fig. 2, a ledge 11 may, if desired, be arranged in the vat 2, just above the roller 5, on which ledge is fastened a piece of belting 12, which lies over the press-cloth and extends over the whole length of the cylinder. This belt, which should be fairly watertight, has for its object to prevent the water from oozing through the cloth, where the belt engages the same. Instead of this belt and the ledge 11 a fairly watertight continuous cloth 14 (illustrated

by the broken line in Fig. 2) may be provided, which is passed around the rollers 5 and 13.

The arrangements described above make it possible to operate the cylinder at a higher speed, whereby the efficiency of the machine is increased.

In Fig. 3 the pressure rollers 15 and 16 for the above-named press cloth are illustrated. If these rollers should not suffice, at the increased speed of the machine, to squeeze the water out of the cloth, a further pressure roller 17 may be so arranged as to press against the roller 15, the pressure cloth being caused to pass between the rollers 15 and 17.

In the machines illustrated in Figs. 4 to 10 special arrangements have been made, for the purpose of raising the water level in the vat above the top of the cylinder, whereby the efficiency of the machine is further increased. To that end, special dikes are arranged on both sides of the spray pipe or of the top of the cylinder, which dikes prevent the water from flowing into the space formed between the dikes.

Referring to Fig. 4, 1 is the strainer cylinder adapted to rotate in the vat 2. 19 is the receiving roller and 20 the spray pipe arranged back of the receiving roller. One of the dikes arranged on both sides of the spray pipe may be formed by the receiving roller 19, which in that case is made to fit tight against the end walls of the vat, for instance by means of such packings as are employed for straining cylinders. The second dike may be formed by a board 21, the lower edge of which extends along the whole length of the cylinder and is provided with a packing 22 of leather, or another suitable material, adapted to slide on the cylinder cloth and fitting tightly against the same. Such dikes being arranged, the water level may be raised above the top of the cylinder without the water flowing from the vat 2 into the space 23, where it would interfere with the working of the spray pipe and prevent the transfer of the pulp layer from the straining cylinder on to the receiving roller.

Machines for making paper board are usually provided with a continuous press cloth 24 which runs between the cylinder 1 and the roller 19 in order to remove the pulp from the cylinder and to convey it to the presses of the machine. For the purpose of securing the introduction of the pulp between the cylinder and the roller 19, the cloth must be conducted in such a manner as to be pressed against the cylinder 1, before it touches the roller 19. In order to make this possible, when the water level is higher than the top of the cylinder, a guide roller 24' is mounted below the water level in the vat 2, around which roller the cloth 24 is made to pass (as is also the case in the machines illustrated

in Figs. 1 and 2). In combination with this arrangement, a special chamber such as above described may also be provided at the place where the press cloth presses down into the water. Pure water is then supplied into this chamber. This arrangement is illustrated by the broken lines 25.

Instead of making the receiving roller serve as a dike against the water in the vat, there may also be provided, as shown in Fig. 5, a board 26 on the front side of the spray pipe. This board should then be provided with a packing in the same manner as the board 21 in Fig. 4. These packings may preferably be arranged in a manner, as shown in Fig. 6.

In strainers for removing fibers from waste water usually no continuous cloth, as that illustrated in Fig. 4, is provided for removing and conveying the pulp, the receiving roller being only covered by a felt, or the like, fastened to the roller. In cooperation with this felt roller is provided a wooden, or ordinary, scraper 27 (Fig. 7) for scraping off the pulp. This scraper may preferably be arranged in the water, and the pulp scraped off discharged through the pipe 28 to be utilized in one way or another. There may be also provided, if desired, instead of the board 21 (Fig. 4) a roller similar to that provided at the front of the spray pipe, such as illustrated in Fig. 8.

If it is desired to keep the water level above the top of the rollers shown in Fig. 8, a plurality of rollers may be provided arranged one above the other, as illustrated in Fig. 9, or there may be also provided, as illustrated in Fig. 10, above the receiving roller 29 a board similar to that over the cylinder shown in Fig. 4.

The embodiment of my invention, as illustrated in Fig. 10, which is specially adapted for machines making paper board, may be employed for removing fibers from waste water, when a short continuous belt, indicated by the broken line in Fig. 10, is arranged around the rollers 29 and 30.

By means of the above described dikes on both sides of the spray pipe or of the top of the cylinder, the water level can be raised above the top of the cylinder without obstructing the working of the spray pipe and without preventing the roller from removing the pulp layer from the cylinder. The raised water-level will increase the pressure on the cylinder, whereby the efficiency of the machine is further considerably increased.

I claim:

In paper making machines the combination with a vat and a cylinder mounted to rotate therein, of a cloth for removing the pulp layer from the surface of said cylinder and conveying it to the outside of said vat, means for causing said cloth to pass into said vat below the surface of the water there-

in and to lie tightly against the surface of
said cylinder, thereby pressing the pulp
layer against it before it is lifted out of the
water, and dikes, arranged on both sides of
5 the top of said cylinder enabling the water
level to be raised above the top of said cyl-
inder.

In testimony that I claim the foregoing as
my invention, I have signed my name in
presence of two subscribing witnesses.

HALVOR GAARA.

Witnesses:

HENRY HASPER,
WOLDEMAR HAUPT.