





# UNITED STATES PATENT OFFICE.

HOWARD PARKER, OF BELLOWS FALLS, VERMONT.

## PAPER-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 693,354, dated February 11, 1902.

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*To all whom it may concern:*

Be it known that I, HOWARD PARKER, of Bellows Falls, in the county of Windham and State of Vermont, (having a post-office address at Bellows Falls, Vermont,) have invented certain new and useful Improvements in Paper-Making Machines, of which the following is a full, clear, and exact description, whereby any one skilled in the art may make and use the same.

My invention relates to a machine adapted to pick up particles of finely-divided material which are held in suspension in a liquid, such as the "stuff" ordinarily used in paper-making.

My device comprises, in the main, a tank adapted to hold the semifluid mass of material, a roll arranged to pick up the stuff and form it into a continuous web of semiplastic material partially free from moisture, and means for removing the web of material from the surface of the roll as soon as it has assumed a form of proper consistency to be handled.

The essential objects of my invention are to provide a rotary mechanism for a paper-making roll which during its revolution will pick up upon its periphery the particles of the stuff, partially extract the moisture from said stuff, and deliver it in a continuous web of any desired thickness.

Referring to the drawings, Figure 1 is an end view of the device with parts cut in section. Fig. 2 is a view, looking toward the left, of the parts shown in Fig. 1, with parts broken away to better show the construction.

In the accompanying drawings the letter *a* denotes a tank built from any suitable material and adapted to hold the stuff which is to be picked up and formed into a continuous sheet or web by the paper-making roll *c*, revolvably mounted therein. This tank is preferably rectangular in shape and is provided with a breasting *a'* of sufficient height to prevent too great an agitation of the material in the compartment *b* in which the paper-making roll is located. The material is introduced to the tank after being ground or reduced by chemical action and after rising over the breasting *a'* floods into the compartment *b*, where it is picked up by the roll.

The paper-making roll *c* is journaled in the tank in any suitable manner, but is preferably fast to the shaft *d*, which has a bearing in the boxes *d'* at either end of the tank, suitable stuffing-boxes *d''* being arranged to prevent the escape of liquid about the bearing. The roll *c* comprises a perforated peripheral shell *c'* and a series of webs *c''*, the latter extending the entire length of the roll and with the perforated peripheral shell forming compartments *c'''*. At either end of the roll a flange *e*, concentrically arranged with relation to the center of the roll, coöperates with an annular fixed flange *a''*, formed on the inner sides of the end members of the tank, the two flanges forming a main chamber *f*. Overlying the meeting edges of these flanges is a packing *f'*, which forms a water-tight joint between them. At the lower end of this chamber *f* is a comparatively large outlet *g*, connected with a suitable pump *G* for exhausting the air from the several compartments of the roll and withdrawing any liquid. At the upper end of the chamber *f* is arranged a second and smaller chamber *h*, having an outlet *h'*, connected with a suitable blower *H* for creating an air-pressure in the chamber *h*. The chamber *h* is provided with inclosing walls *h''*, which completely shut it off from the main chamber *f*, but is, however, open on its side nearest the end of the roll, as shown at *h'''* in Fig. 1. It will be observed from this construction, there being a constant air-pressure in the chamber *h*, that the compartments *c'''* as they come into registering position with the opening *h'''* will also be filled with air under pressure, which can find its way out only through the perforations *c''*, formed in the outer shell of the roll. At one side of the roll and arranged in close proximity to it is a doctor *i*. This is preferably hinged at its outer end, as at *i'*, to ears *a'''* on the tank and is arranged with its inner end substantially tangential to the roll. It is preferably located with its operative inner edge just in advance of a compartment when the latter is in its registering position with the opening of the air-chamber *h*. Said edge rests by gravity upon the roll and is also drawn toward the same to some extent by the suction of the air flowing into the roll beneath the



body of the doctor. The office of this doctor is to deflect the web of material which has been formed on the periphery of the roll.

The operation of the device will be readily understood. The roll being driven from any suitable source of power and having its several compartments under the action of the exhaust-pump connected with the outlet-pipe *g*, picks up during its revolution particles of the material in the tank. This picking up of the material will continue so long as the periphery of the roll is in contact with the semi-fluid mass. As soon as one of the compartments is carried beyond the level of the material in the tank, the suction action still continuing, any superfluous moisture in the material will be removed, and as the compartment revolves still farther and is brought into registering position with the air-chamber *h* a pressure will be created within the compartment which will lift the material carried on the periphery at a proper time to allow the doctor *i* to engage it and deflect it from the roll.

The thickness of the material, or rather the web of material, which is formed on the roll may be regulated and varied by an adjustment of the speed of the roll and the force of the suction action or by varying the depth to which the roll is immersed. The surface of the roll, as in all devices of this sort, is covered with a finely-divided screen, which may be applied in any well-known manner. As shown in the drawings a chamber with inlet and outlet ports and pump connections is provided at each end of the device, and this is the preferred construction, though it is not necessary to have compartments at both ends for the purposes of the inventor. In fact, many of the details of construction might be changed without materially altering the main idea sought for, and I do not wish to limit myself to the precise construction herein shown and described, as any paper-making roll having a series of isolated compartments extending from end to end of the roll and opening into an exhaust-chamber formed at the end thereof with means for creating an air-pressure in the several compartments at a predetermined time would come within the scope of my invention.

I claim as my improvement—

1. In a paper-making machine, the combination with a tank for the pulp, and a rotary perforated roll mounted therein; of means for picking up, partially drying, and delivering the pulp in a web, and a doctor hinged at one end to a support and having its other end standing in operative relation to the roll.

2. In a paper-making machine, the combination with a tank for the pulp, and a rotary perforated roll mounted therein; of means for creating suction within the roll above and below the level of the pulp, means for interrupting this suction at a point above said level, and a doctor having its edge standing in operative relation to the roll just beyond the

point in the direction of rotation where said interruption occurs.

3. In a paper-making machine, the combination with a tank for the pulp, and a rotary perforated roll mounted therein; of means for creating suction within the roll above and below the level of the pulp, means for creating air-pressure within the roll at a point above the level of the pulp, and a doctor having its edge standing in operative relation to the roll just beyond the point in the direction of rotation where said air-pressure occurs.

4. In a paper-making machine, the combination with a tank for the pulp, and a rotary perforated roll mounted therein; of means for causing the pulp to adhere to the surface of the roll, means for producing air-pressure within the roll at a point above the level of the pulp, and a doctor having its edge standing in operative relation to the roll just beyond the point in the direction of rotation where said air-pressure occurs.

5. In a paper-making machine, the combination with a tank for the pulp, and a rotary roll therein comprising a perforated shell and a series of radial webs forming compartments; of means for creating suction within certain of said compartments, means for interrupting this suction at a point above the level of the pulp, and a doctor standing in operative relation to the upper portion of the roll.

6. In a paper-making machine, the combination with a tank for the pulp, and a rotary roll therein comprising a perforated shell and a series of radial webs forming compartments; of means for creating suction within certain of said compartments, means for producing air-pressure within certain of the compartments above the level of the pulp, and a doctor resting upon the top of the roll.

7. In a paper-making machine, the combination with a tank for the pulp, and a rotary roll therein comprising a perforated shell and a series of radial webs forming compartments; of means for causing the pulp to adhere to the surface of the roll, means for producing air-pressure within certain of the compartments at a point above the level of the pulp, and a doctor standing in operative relation to the top of the roll.

8. In a paper-making machine, the combination with a tank for the pulp, and a rotating roll therein having a perforated shell and a series of radial webs forming compartments open at the end; of a main chamber registering with the end of the shell, packing surrounding the chamber and said end, means for producing suction in such chamber, a smaller chamber passing through the main chamber at one point and isolated therefrom, and means for producing air-pressure in this smaller chamber, all as and for the purpose set forth.

9. In a paper-making machine, the combination with a tank for the pulp, and a rotating roll therein having a perforated shell and a series of radial webs forming compartments



open at the end; of an exhaust-chamber registering with the end of the shell, means for producing an exhaust therein at points above and below the level of the pulp, a smaller  
5 chamber passing through the exhaust-chamber and communicating with certain of said compartments while they are above the level of the pulp, and means for producing pressure in this smaller chamber, as and for the purpose set forth.  
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10. In a paper-making machine, the combination with a tank for the pulp, and a rotating roll therein having a perforated shell and a series of radial webs forming compartments  
15 open at the end; of a chamber registering with the end of the shell and permitting the outlet of water at the bottom, a smaller chamber opening through the larger and commu-

nicating with the roll-compartments at a point above the level of the pulp, and means for producing air-pressure in this smaller chamber. 20

11. In a paper-making machine, the combination with a tank for the pulp, and a perforated rotating roll therein; of means for causing the pulp to adhere to the roll, means for  
25 producing air-pressure within the roll at a point where the web of pulp is to be delivered therefrom, and means just beyond this point in the direction of rotation for positively deflecting said web from the surface of  
30 the roll.

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Witnesses:

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