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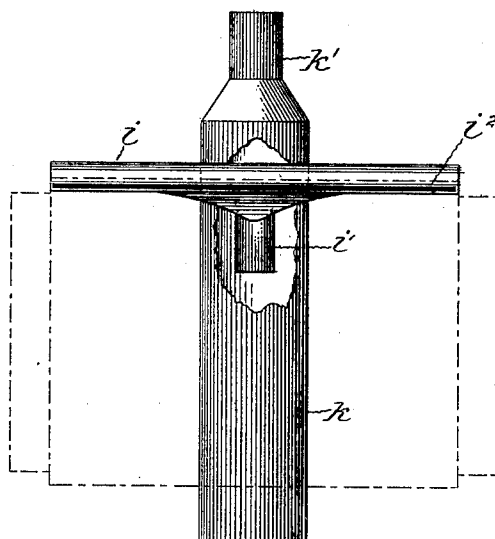
H. PARKER.
PAPER MAKING MACHINE.

(Application filed June 20, 1900.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 3



Witnesses
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HOWARD PARKER, OF BELLOWS FALLS, VERMONT.

PAPER-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 690,030, dated December 31, 1901.

Application filed June 20, 1900. Serial No. 21,006. (No model.)

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 new and useful Improvements in Paper-Making Machines, of which the following, when taken in connection with the accompanying drawings, is a description, whereby any one skilled in the art may make and use the same.

It is well-known that in machines of this class the pulp is suspended in a liquid, preferably water. It is picked up generally by roll and formed into a sheet, the suspending-fluid being withdrawn to leave the pulp in the proper condition for the addition of the bleaching materials, clay, lime, &c., which forms a part of the process of making paper. When the pulp is formed into a sheet and the water partly extracted therefrom, it is necessary to break up this sheet in order to thoroughly mix with the pulp the ingredients afterward to be added.

My invention relates more particularly to the peculiar means employed for collecting the "stuff" onto the roll during part of its revolution and loosening it during the remainder of the revolution and to the apparatus used for removing the web so formed from the roll and delivering it for further manipulation in condition to be worked with the bleaching and other materials above mentioned.

I will describe my invention as it is adapted for use in paper-making machines, although it is clear that it may be used in connection with apparatus acting similarly but upon different substances.

My invention will be more particularly described with relation to the drawings, in which—

Figure 1 is a view in end elevation of my improved machine with parts broken away to better show the construction. Fig. 2 is a side elevation of the parts shown in Fig. 1 with the doctor and appurtenances removed and parts cut in section to show the construction. Fig. 3 is a front view of the doctor and its appurtenant parts.

In the accompanying drawings the letter *a* denotes a tank of suitable size and form to hold the stuff or pulp, which is fed into it

from a suitable source after it has been prepared and reduced by any of the well-known methods of the art. This tank is provided with a breasting *a'* of ordinary construction to prevent too great an agitation of the pulp about the paper-making roll. At either end of the tank the inner walls are provided with an annular flange *a²*, which coöperates with a flange of similar form *c²*, located on the ends of the paper-making roll *c*, the two flanges forming a chamber *d* of cylindrical form, the purposes of which will be hereinafter described. Journals *e* are arranged at the center of the annular flange *a²* and are provided with suitable stuffing-boxes *e'*, the bearings and stuffing-boxes being adapted to support and form a tight joint for the shaft *f*, to which the roll *c* is secured and by which it is driven from any suitable source of power. A packing *c⁴* is arranged to form a tight joint between the ends of the annular flanges *a²* and *c²*. An exhaust-pipe *g*, connected with any suction-pump or other means for withdrawing air or material from the chamber *d*, is connected with said chamber at its lowermost side. As shown in the drawings, there are two of these exhaust-pipes *g*, one at either end of the machine, connected with compartments which are identical in construction, and this is the preferred form, though the device for the purposes of the invention will operate with a single compartment and exhaust-pipe, or, in fact, if the roll is immersed a sufficient distance the suction may be disconnected and the force of gravity and the buoyancy of the material will compact the flakes of material upon the surface of the roll and the liquid will fall within the roll and find its way out through the compartments and pipes *g*.

The roll *c* has a perforated outer shell *c'*, supported upon or cast integral with arms *c²*. These arms, or more correctly webs, extend from end to end of the roll and form compartments within it. As shown in Fig. 1, they radiate from a common center for a short distance and then separating merge into the inner walls of the peripheral shell, thus forming compartments of different sizes with the alternate ones arranged at a different radial distance from the center. By this construction the flow of the water which is collected within the roll during the process of

forming a web of the paper will be somewhat broken up. A wire screen *h* of fine mesh is applied to the periphery of the roll, as in all devices of this sort.

- 5 To prevent the suction action which is applied to the interior of the roll from holding the web of material too firmly upon it at the point where it is to be taken off by the doctor, an adjustable wing *l* is mounted upon
10 the journal projecting from the end of the tank and so arranged that its face *l'* covers the ends of the several compartments as they are moved past it and stops for a moment the effect of the suction action within the roll.
15 This wing may also be arranged with an opening through which a pipe *l²*, as indicated in dotted outline, connects the several compartments with the air outside the roll, and thus effectually and suddenly breaks the vacuum
20 within the compartments. This action will drive the material away from the surface of the roll.

- In connection with the apparatus above described I employ a doctor of peculiar construction. The snout *i* extends the entire
25 length of the roll and has a small opening *i²* throughout its whole length which is nearest the surface of the roll. This snout is narrowed down at the back and carried into a
30 pipe *i'*, which projects into the interior of a stack *k*. From the bottom of the stack *k* projects the overflow-pipe *m*, and at the top of the stack there is attached a suction apparatus *k'* of some sort.

- 35 The operation of this apparatus is as follows: The overflow-pipe *m* and the stack are filled with a sufficient quantity of pulp and water to prevent air entering the pipe *m* and passing up and out of the top of the stack *k*.
40 As the roll is rotated in the semifluid mass of pulp the finely-divided particles will be drawn against the periphery of the roll by the suction action created in the immersed compartments by the blowers or pumps attached to the pipe *g*. As each compartment is cut off
45 from the suction action of the blower by the adjustable wing *l* the web of pulp over those compartments is loosened from the roll, and as the pulp passes under the opening *i²* in the
50 snout *i* of the doctor the suction at the top of the stack *k* draws the pulp into the doctor and through the pipe *i'*, dropping it into the bottom of the stack *k*. The pulp as it drops into the stack *k* is necessarily broken up and
55 is in a sufficiently mobile condition so that it will flow out of the bottom of the stack into the pipe *m* and siphon out in the direction indicated by the arrow. •The suction at the top of the stack *k* is just sufficient to pick the
60 pulp off of the roll and draw it through into the stack, but is not strong enough to carry any of the pulp out through the top of the stack, nor is it sufficient to draw air into the pipe *m* through the pulp therein and out
65 through the snout of the doctor. The course of the air is indicated by arrows shown in dotted lines in Fig. 1 and of the pulp is shown

in full-line arrows in the same figure. The pipe *m*, filled to its elbow with water, as shown, forms a trap to prevent the inflow of
70 air. Hence the suction at *k'* must draw air in through the snout of the doctor *i*. As the snout stands over that portion of the roll *c* where the suction is broken by the wing *l* the
75 draft of air entering the snout will carry with it the web on the surface of the roll, care being taken that the suction at *g* has not been sufficiently strong to compact this web, so that the suction at *k'* cannot detach it from the roll. It follows that the pulp which in the
80 tank *a* was not in condition to be worked by the bleaching and finishing processes is picked up by the roll and has a great amount of its moisture extracted. It is then carried through the doctor, wherein it is broken from its sheet form
85 and deposited in the stack *k*, at first possibly being quite soft, but soon mingling with the water in the stack, and finally it is siphoned off through the pipe *m* to the proper bleaching and finishing devices. This course results
90 in cleansing the pulp which was in the tank *a* and freeing it from grit.

The thickness of the web of material may be adjusted by varying the speed of the roll and the force of the suction within it.

As above stated, this apparatus can be used in connection with any art in which it is desired to collect particles from solution into a more or less solid web and remove them from the collector.

I claim as my invention—

1. In combination in a machine of the class specified, the tank, perforated roll revolvably mounted therein, having its interior divided longitudinally into compartments, means for
105 creating a suction within the compartments at or about the time they are immersed, means for stopping said suction at or about the time the compartments leave the solution and a suction-operated doctor to remove the
110 material from the roll, substantially as described.

2. In combination in a machine of the class specified, the tank, solution therein, roll revolvably mounted in the tank and partly submerged in the solution, compartments formed in the interior of the roll lengthwise thereof, means for creating a suction in the compartments at or about the time they enter this solution adapted to draw and hold particles
120 of material upon its periphery, adjustable means for stopping the suction at or about the time the compartments leave the solution, and a suction-operated doctor adapted to remove the material from the roll, substantially
125 as described.

3. In combination in a paper-making machine, a tank, a perforated roll mounted within the tank, and means for rotating it, compartments extending from end to end of the
130 roll, said compartments connected with a suction apparatus adapted to attract particles of material to the periphery of the roll, means for shutting off the suction action from the

several compartments at a predetermined point in their rotation, and a suction-action doctor coöperating with the roll and adapted to remove the material which has been formed upon the periphery of the latter.

4. In combination in a device of the class specified, a perforated paper-making roll having a suction action applied to its interior for collecting particles of material, means for breaking the suction, and a suction-operated doctor coöperating therewith.

5. In combination, in a paper-making machine, a tank, a paper-making roll revolubly mounted within the tank and provided at its end or ends with a suction-chamber, an adjustable wing located within such chamber or chambers and adapted to prevent the force of the suction action from acting upon certain portions of the roll, and means coöperating with said wing for removing the material from the periphery of the roll.

6. In combination, in a paper-making machine, a tank, a paper-making roll revolubly mounted in the tank and having a series of longitudinal compartments interiorly arranged and extending from end to end thereof, an annular flange arranged at the end of the roll and coöperating with a stationary flange of similar form, the two flanges forming a compartment connecting the several longitudinal compartments of the roll, means for cutting off certain of the compartments of the roll from the end compartment, an interior suction action operating through the compartments and adapted to collect the material upon the periphery of the roll and an exteriorly-arranged suction action for removing the material.

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Witnesses:

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