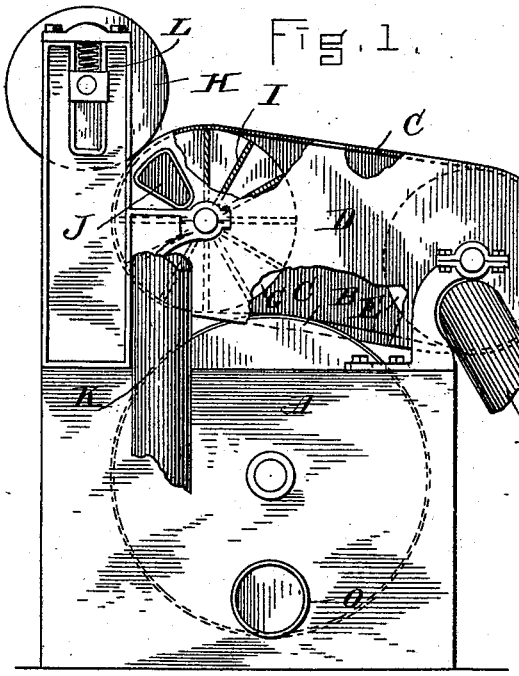
(No Model.)

H. FAIRBANKS & H. PARKER.

MACHINE FOR COUCHING AND DRYING PULP.

No. 522,589. Patented July 10, 1894.

Fig. 1.



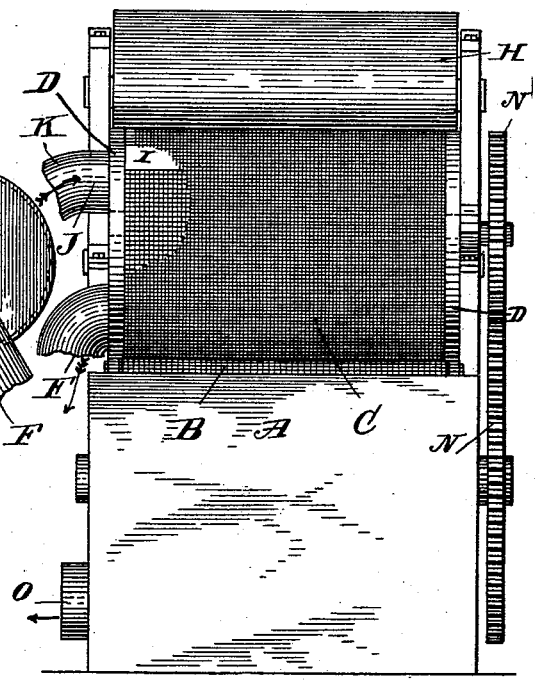


Fig. 2.

Fig. 3.

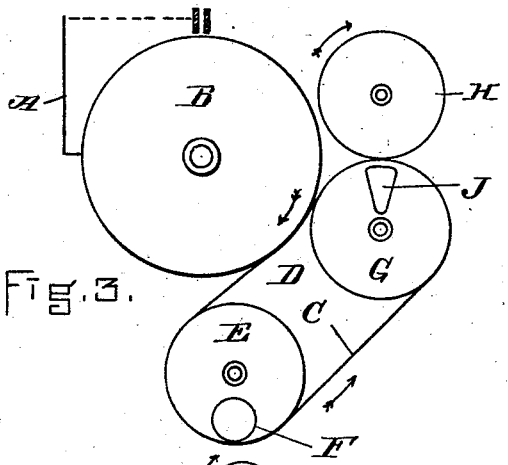
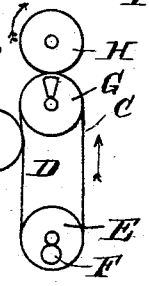


Fig. 4.



WITNESSES.

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UNITED STATES PATENT OFFICE.

HENRY FAIRBANKS AND HOWARD PARKER, OF ST. JOHNSBURY, VERMONT, ASSIGNORS TO THE VACUUM WET MACHINE COMPANY, OF VERMONT.

MACHINE FOR COUCHING AND DRYING PULP.

SPECIFICATION forming part of Letters Patent No. 522,589, dated July 10, 1894.

Application filed April 10, 1891. Serial No. 388,357. (No model.)

To all whom it may concern:

Be it known that we, HENRY FAIRBANKS and HOWARD PARKER, both of St. Johnsbury, in the county of Caledonia and State of Vermont, have jointly invented certain new and useful Improvements in Machines for Couching and Drying Pulp, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention is a new couching apparatus or machine for couching and drying paper or wood pulp.

The main feature of novelty in our apparatus consists of a coucher box formed with rolls at the ends over which passes a porous traveling belt, forming the top and bottom of the box, and running in contact with its sides, the interior of the box being connected with an exhausting apparatus, and the porous belt taking the pulp layer off of the gauze or mold roll by the action of the exhaust current. The porous belt is arranged to run in peripheral contact with the ordinary mold roll, and, by the aid of the strong exhaust, removes therefrom the layer of wet pulp, which is dried by the pressure of the atmosphere due to the exhaust current, while it is carried across the bottom and top of the exhausted box, and around the hollow perforated roll forming one end thereof. It is then in condition to be taken upon the press roll, and the transfer process is aided by an outward current through the surface of the compression roll at that point, and through the porous belt upon said roll. This roll is constructed with simple radial partitions, the compartments so formed being closed at one end, and opening at the other against the packed head, through which at one point in the revolution they communicate with a pipe which brings a current of compressed air.

In the drawings, Figure 1 is a side elevation with parts broken away, showing a tank and apparatus embodying our invention. Fig. 2 is an end elevation of said apparatus, and Figs. 3 and 4 are diagrams illustrating modified forms thereof.

A is the pulp vat, B the mold roll revolving in the vat, the deposit of pulp upon its surface being preferably aided by partially exhausting the interior, which may be done through the pipe O by which water is withdrawn from within the roll. The mold-roll will be provided with a stationary head with which the outlet O is connected, in case an air-exhaust is applied to said outlet.

C is the belt suction coucher, of which the stationary sides D are far enough apart to allow the mold roll A to work between them, so that it is not necessary to provide yielding bearings, but the yielding of the belt gives the proper pressure.

The belt C has two supporting rollers E and G, of which the lower roll E is a skeleton with coarse wire gauze cover, through the open end of which the water drawn from the pulp flows freely to the exhaust outlet F. This roller E may be in adjustable bearings, as in Fig. 1, to give the proper tension to the porous belt C, the slides D being slotted to give a lateral movement to the journals.

The upper roll G is in fixed bearings to receive the pressure of the press-roll H, and is geared to the mold roll by cog-wheels N. This upper roll G of the coucher has no interior mechanism except the radial partitions I forming compartments which at one end open successively into the port J in the side of the box, as they pass that port. Through said port compressed air is brought by the pipe K into the several compartments of roller G,—by the escape of which, through the porous surface of the roll, and the porous belt, the removal at the line of contact with the press roll H is aided.

If desired, the press roll may be omitted, and the air blast made strong enough to force off the web of nearly dry pulp and thus to further dry it and put it in condition for removal in mass or flake for treatment in other machines. The end or shell of the roll with its partitions is so packed against the side of the box that air cannot enter except through the port J, or escape, except through the perforated peripheral portion of each sector compartment. A traveling apron may carry the blown off flakes over drying rolls.

The press roll H revolves upon an arbor in guides L, and is pressed against the upper roll of the suction coucher, by gravity or otherwise. Two interchangeable forming or press rolls may be used if desired.

Parts of the invention may be used without the whole. The suction belt coucher may be constructed without the compressed air roll, and the press roll will then remove the layer of pulp from the belt just where it comes to or just after it reaches the upper roll, if that roll is solid.

The mold roll, instead of working in a pulp vat below it, may have a tank upon one side, and partly above it, as outlined in Fig. 3. Or the suction belt coucher may take the layer from a wire apron, as in Fig. 4. The traveling belt C of the coucher is preferably formed of thin perforated sheet brass, brazed into an endless belt, and covered with coarse cloth, the brass belt being as wide as the space between the plain sides of the box, and the cloth a little wider so as to pack the edges against these stationary sides. But the belt may be made up of narrow plates linked at the edges. The interior being connected with a large volume exhausting fan, a good exhaust is secured without the necessity of making the air stop perfect.

We claim as our joint invention—

1. In a machine for couching and drying paper pulp, the suction belt coucher described, which consists of a porous, traveling belt, two stationary parallel sides, fitting to the edges of said belt, and the two rolls which distend and carry the said belt, these sides with the belt passing over the rolls forming a closed box, in combination with an exhaust passage through which air and water are withdrawn from within the box so formed, with the straining wire gauze against which said belt rolls on the one side, and with the forming or press-roll on the other side, as and for the purpose set forth.

2. In a machine for couching and drying paper pulp, the suction belt coucher described, which consists of a closed box, adapted to be partially exhausted of air and having parallel stationary sides, provided with an exhaust opening, rotating end-rolls reaching from side to side, and a porous traveling belt mounted on said rolls and closing the space between the sides, in combination with the pulp-carrying wire gauze from which the pulp layer is taken, and with an air passage connected with successive longitudinal compartments of the roll at the line where the pulp leaves the said belt, for the purpose set forth.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, on this 20th day of February, A. D. 1891.

HENRY FAIRBANKS.
HOWARD PARKER.

Witnesses:
CHAS. H. HORTON,
C. M. SPENCER.